

Transportation: Adapting to a Changing Climate Webinar Series

Strengthening climate resilience for aviation organizations through climate risk assessments and adaptation measures

Tuesday, March 7, 2023, 1:00 pm to 2:30 pm ET

Presenters:



Rachel Burbidge
*Senior Policy Officer,
Environment and
Climate Change*



Andrea L. Deitz
*Foreign Affairs
Specialist, U.S. Federal
Aviation Administration
(FAA) Office of
International Affairs*



ICAO

ENVIRONMENT

Strengthening climate resilience for aviation organizations through climate risk assessments and adaptation measures

Rachel Burbidge and Andrea Deitz, ICAO CAEP Task Leads



- ICAO work on Climate Change Adaptation
- Development of the Guidance on Climate Change Risk Assessment and Adaptation Planning for Aviation Organisations
- Overview of the Guidance:
 - Climate Change Risk Assessment and Adaptation Planning for Aviation Organisations
 - Key Vulnerabilities
 - Overview of the Menu of Options



ICAO

ENVIRONMENT

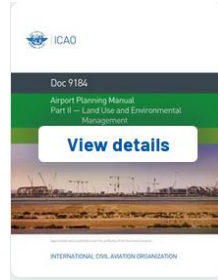
ICAO Work on Climate Change Adaptation



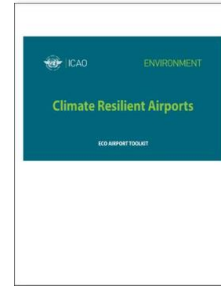
ICAO Joint Support Committee (JSC)

Scoping Study On The Possible Effects Of Climate Change On Air Navigation Services Over The North Atlantic (2015)

Airport Planning Manual (2018)



Eco-Airport Toolkit e-publication on Climate Resilient Airports



WMO Statement on the State of the Global Climate in 2018



Climate Risk Assessment, Adaptation and Resilience Report (2022)



2013

2015

2016

2018

2019

2022

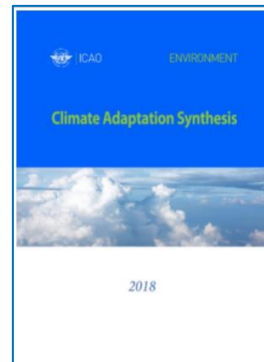
38th Session of ICAO Assembly

39th Session of ICAO Assembly

ICAO Climate Adaptation Synthesis Report (2018)

40th Session of ICAO Assembly

41st Session of ICAO Assembly





2018 ICAO Climate Adaptation Synthesis

- Report synthesizes existing information on the range of projected climate impacts on the aviation sector to better understand risks to
 - airports, air navigation service providers (ANSPs), airlines, and other aviation infrastructure
- The impacts which most respondents expect to be the biggest challenges are :
 - increased intensity of storms (42 respondents),
 - changing precipitation (38 respondents), and
 - higher average and extreme temperatures (35 respondents)

6. Analysis of Impacts Which Stakeholders Expect to be the Biggest Challenge

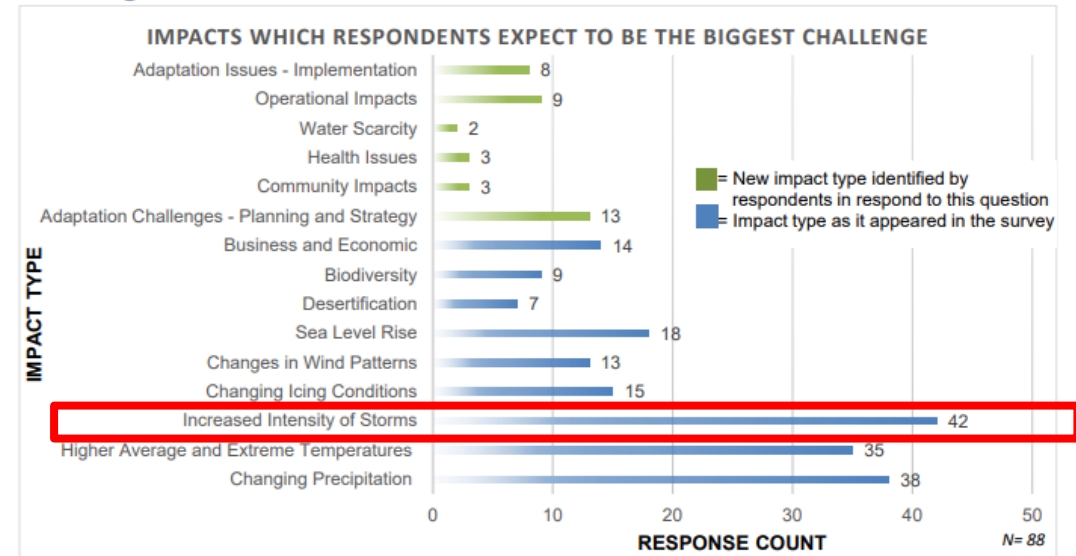


Figure 42: Impacts which respondents expect to be the biggest challenge

The impacts which most respondents expect to be the biggest challenges are increased intensity of storms (42 respondents), changing precipitation (38 respondents), and higher average and extreme temperatures (35 respondents).

This question was an open question and so respondents were able to list their individual top three challenges. Many impacts which respondents listed fit into the impact categories previously determined. However, others addressed different challenges. These were grouped according to the impact types in green in Figure 42. For example, "Adaptation challenges – planning and strategy" included responses such as increasing the level of knowledge regarding climate impacts on air navigation services, and identification of lack of finance, whilst "Operational Impacts" included responses such as operational disruption due to adverse weather and concerns about an increase in Clear Air Turbulence (CAT).



- Aim: to provide support to States and aviation organisations to adapt and build resilience to the risks of climate change.
- Developed over a three-year period by the ICAO CAEP Working Group on Airports and Operations.
- Approved by the ICAO Council.
- Available from ICAO website <https://www.icao.int/environmental-protection/Pages/Climate-Change-Climate-Risk-Assessment,-Adaptation-and-Resilience.aspx>
- Provides *generic and non-prescriptive* guidance on:
 - How to do a climate change risk assessment and develop and implement a climate change adaptation plan.
 - An overview of key climate change vulnerabilities which a State or organisation may be at risk from.
 - A menu of potential adaptation options for States and organisations to consider.
- Intended for use by airports, aircraft operators and air navigation service providers (ANSP) across the global aviation network.
- Can also be used by States for climate change risk assessment of their aviation sector.



ICAO

ENVIRONMENT

ICAO Climate Change Risk Assessment and Adaptation Planning Guidance





Key Steps for Aviation Organisation Climate Change Risk Assessment and Adaptation Planning

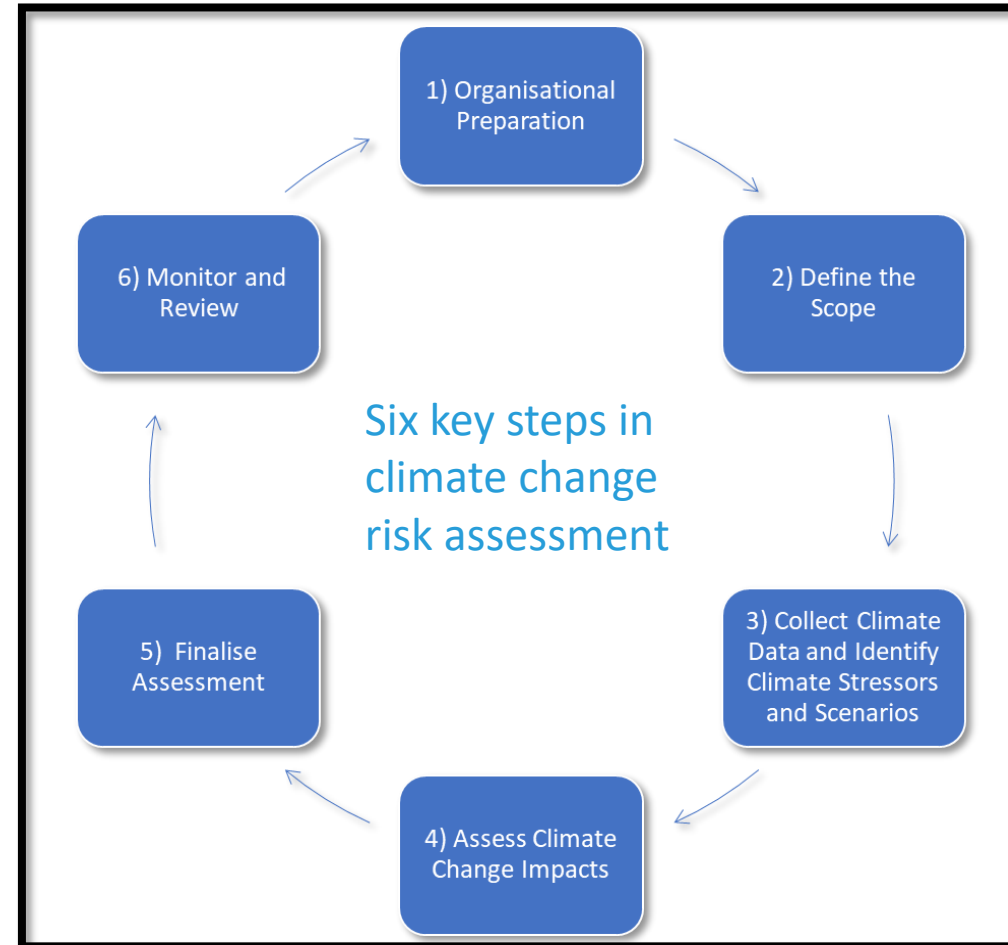


This document sets out a step-by-step process divided into two stages, "Risk Assessment" and "Adaptation Planning", to carry out a climate change risk assessment and develop and implement a climate change adaptation plan. This process can be scaled and utilized by States and organisations of any size or structure.



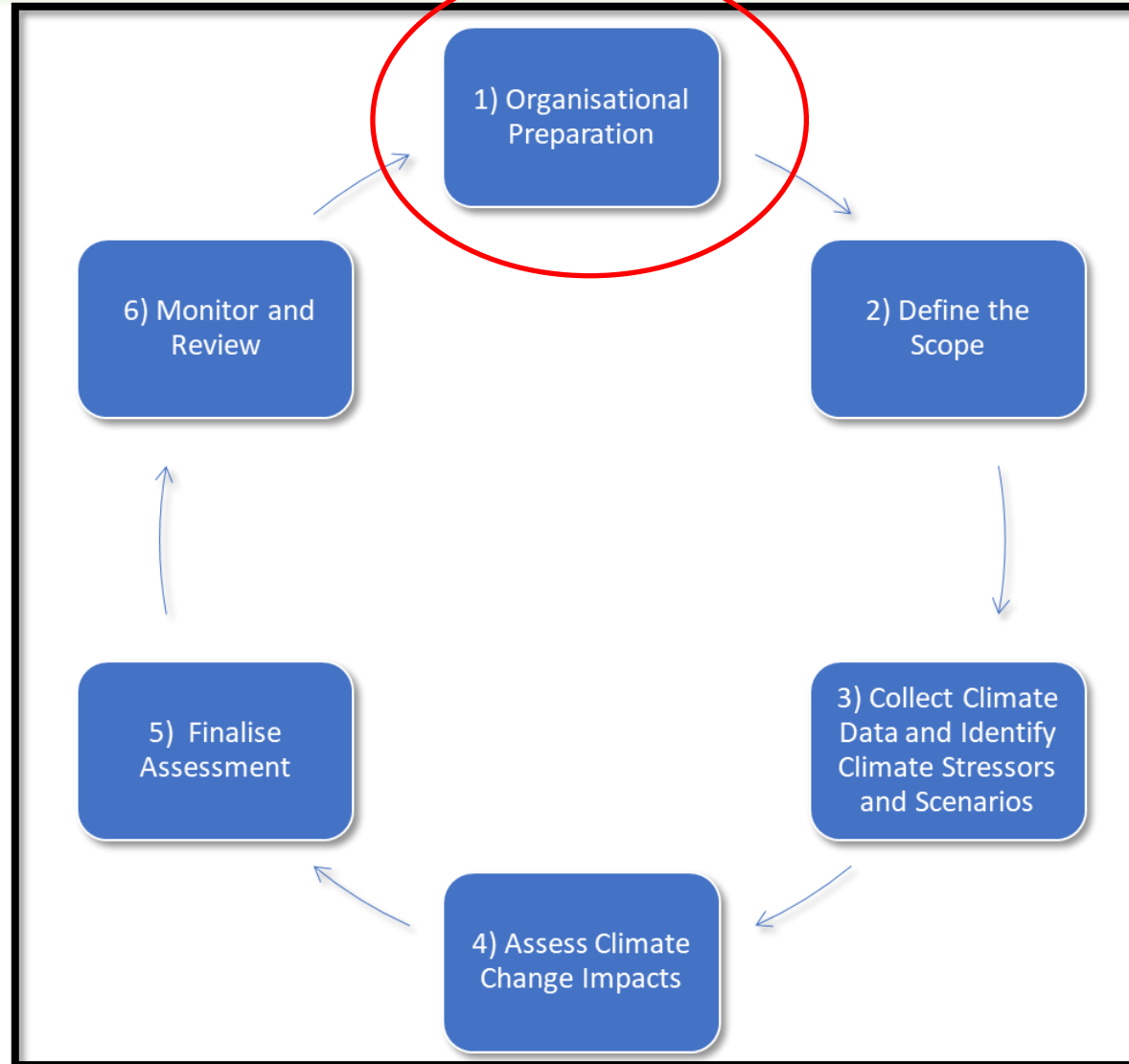
Key Steps for Aviation Organization Climate Change Risk Assessment and Adaptation Planning

- Step-by-step process divided into two stages, "Risk Assessment" and "Adaptation Planning", to carry out a climate change risk assessment and develop and implement a climate change adaptation plan.
- This process can be scaled and utilized by States and organizations of any size or structure.



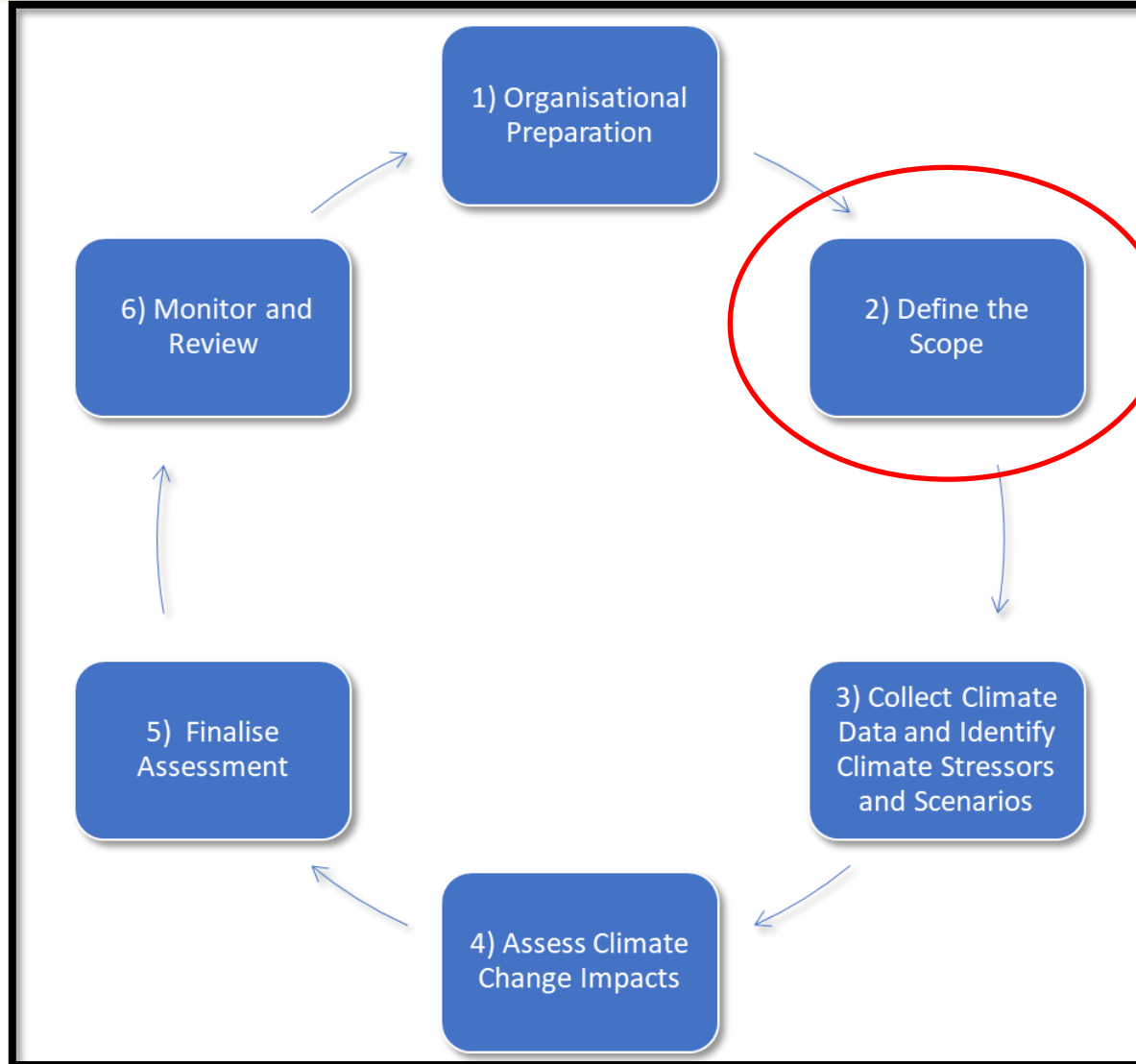


Key step 1: Prepare the Organisation for the Assessment



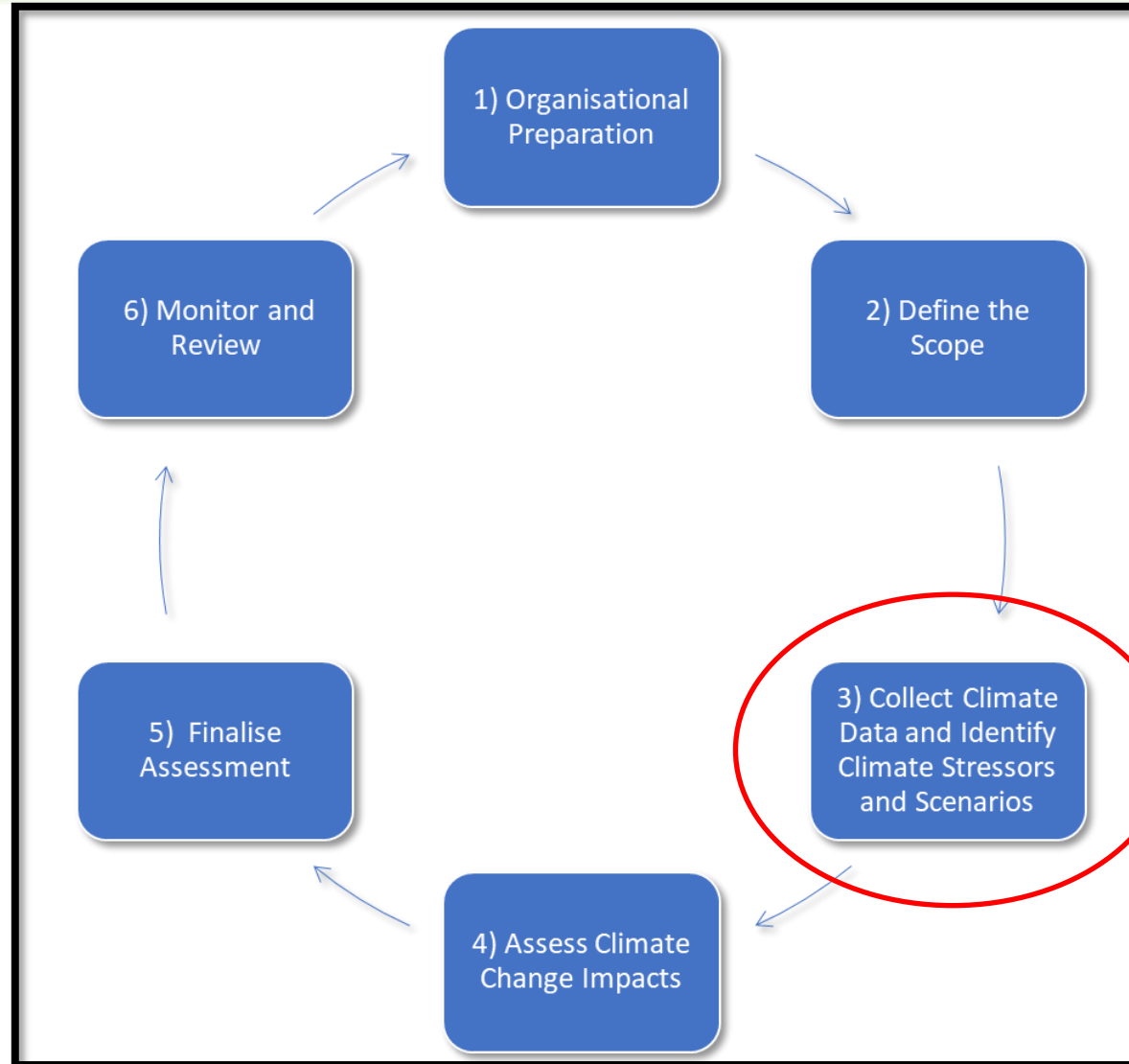


Key step 2: Define the scope of the assessment



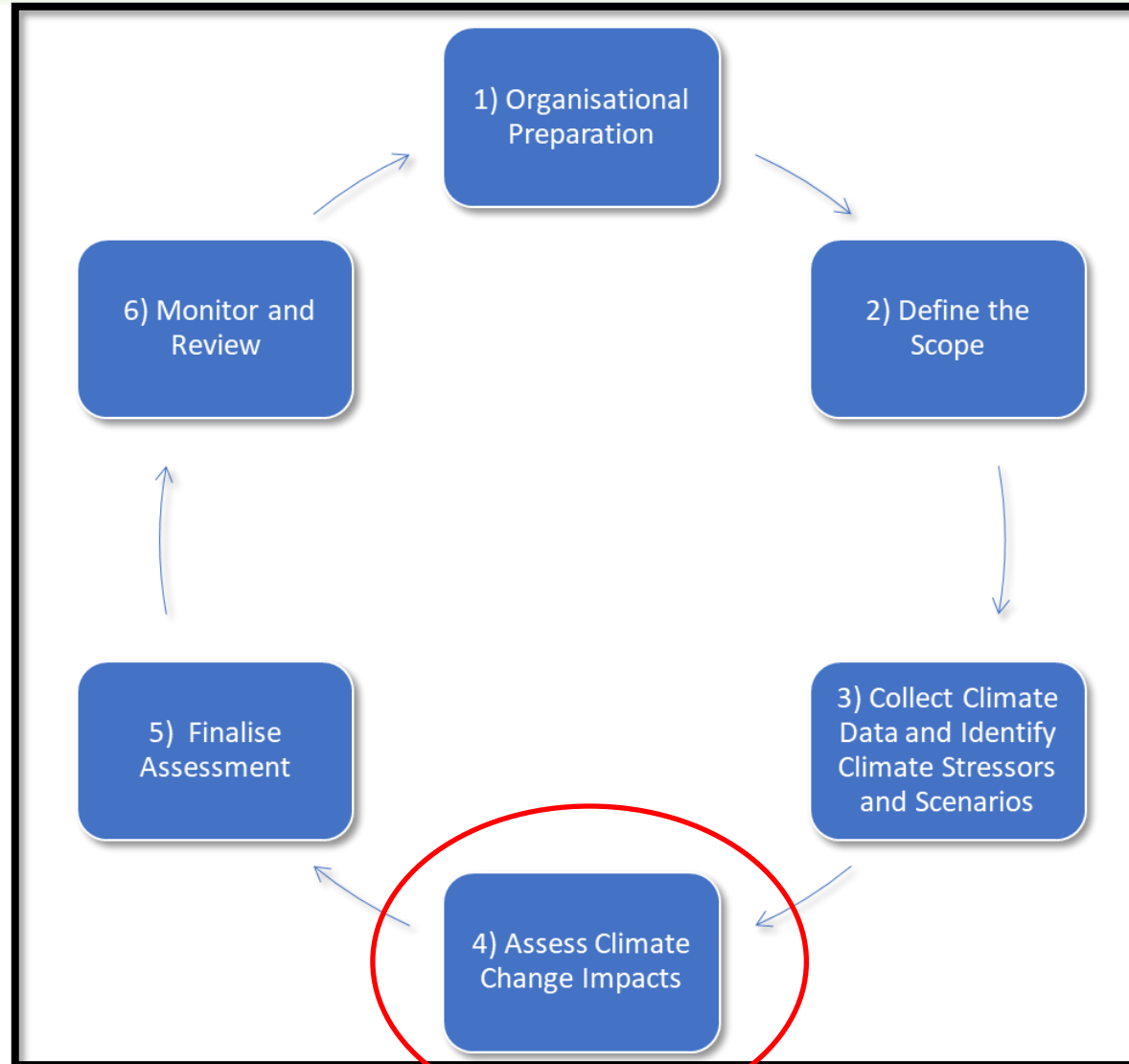


Key step 3: Collect climate data, identify climate stressors and scenarios





Key step 4: Assess climate change impacts (1/3)





Key step 4: Assess climate change impacts (2/3)



Organisation Type	Climate stressor	Potential effect
Airport	Sea level rise	Permanent or temporary inundation
ANSP	Increased intensity of storms	Impacts on capacity and flow management
Aircraft Operator	Higher temperatures	A reduction in payload due to reduced climb performance

Table 1: Examples of potential effects of specific climate stressors on aviation organisations



Key step 4: Assess climate change impacts (3/3)

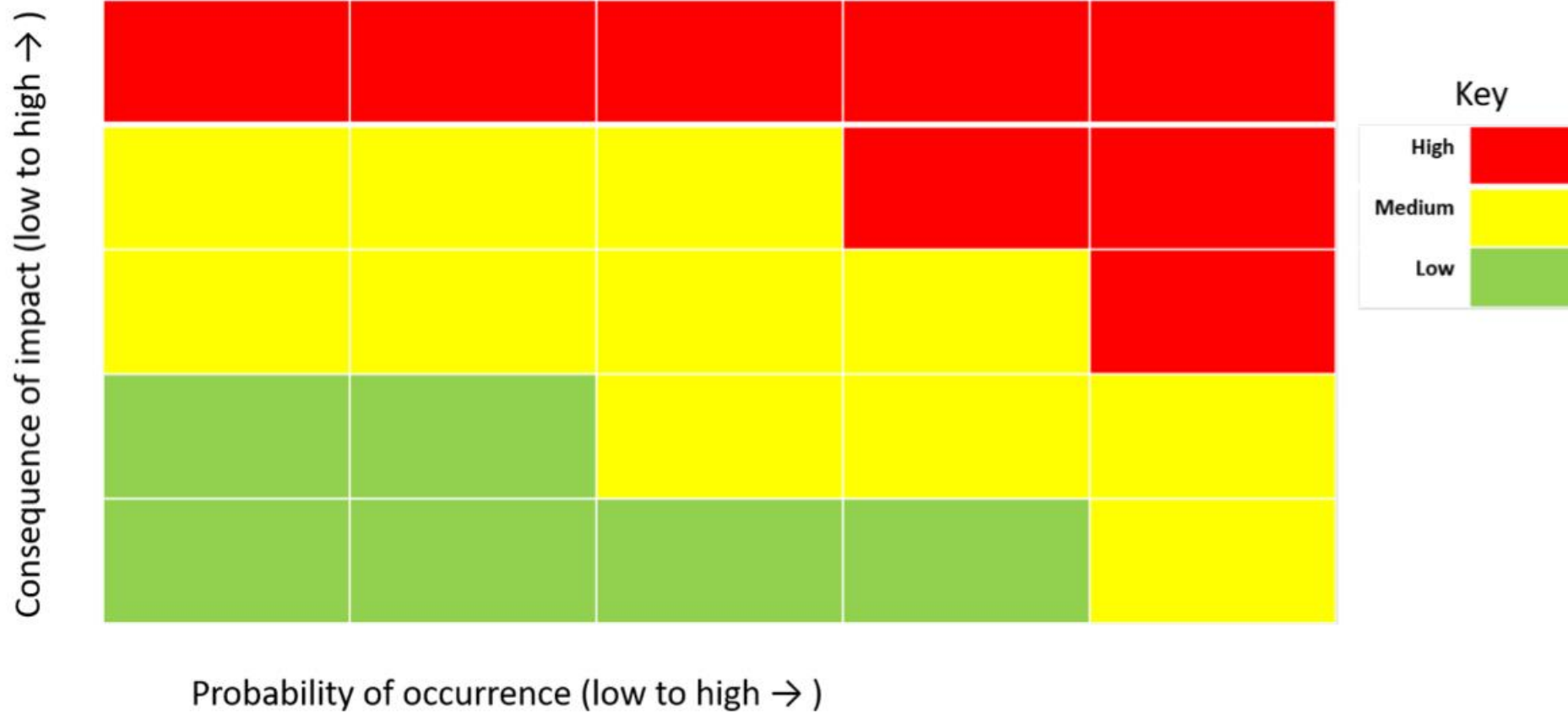
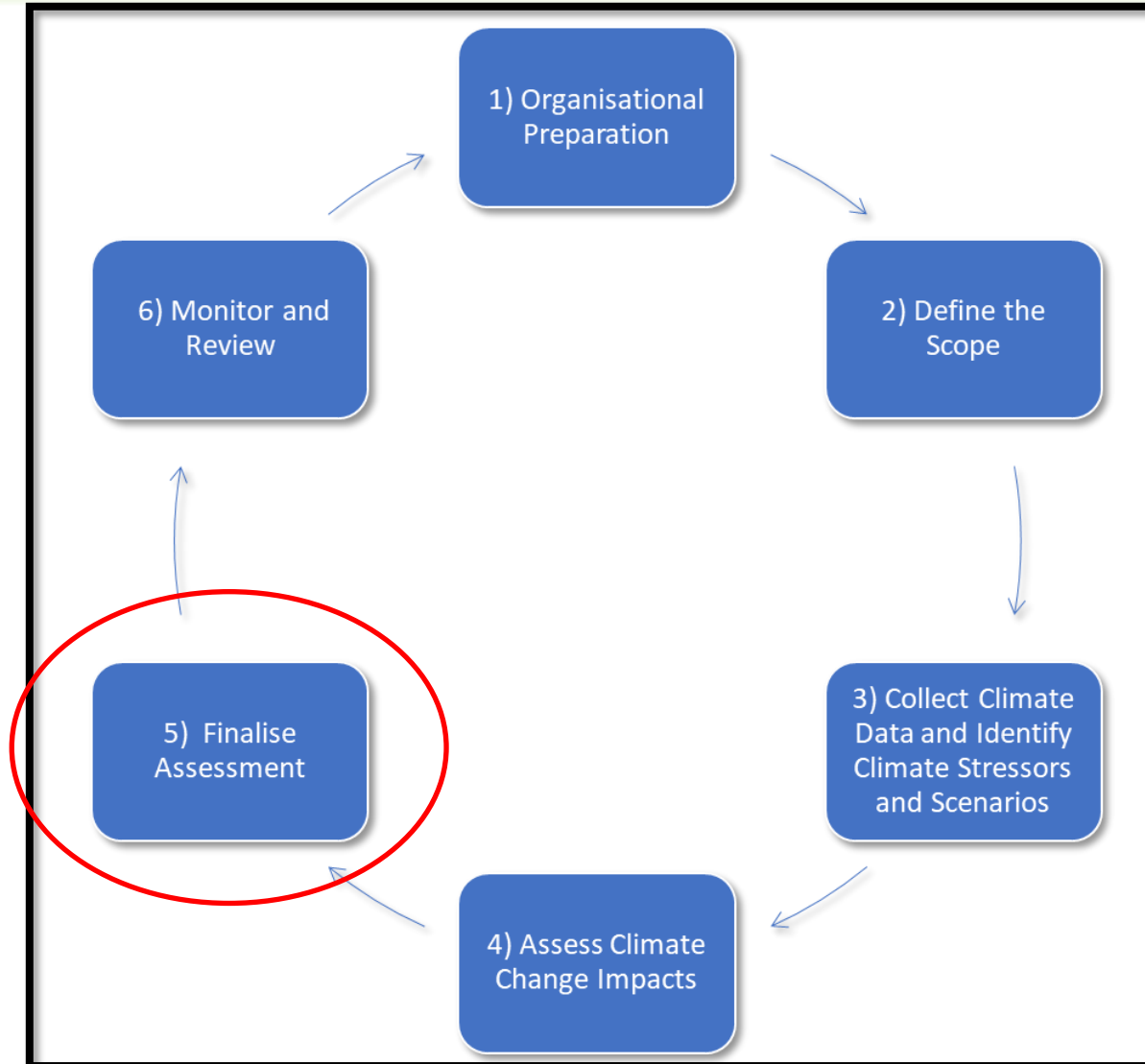


Figure 4 - Example risk matrix (note: this will vary according to the specific risks and consequences an organisation faces.)

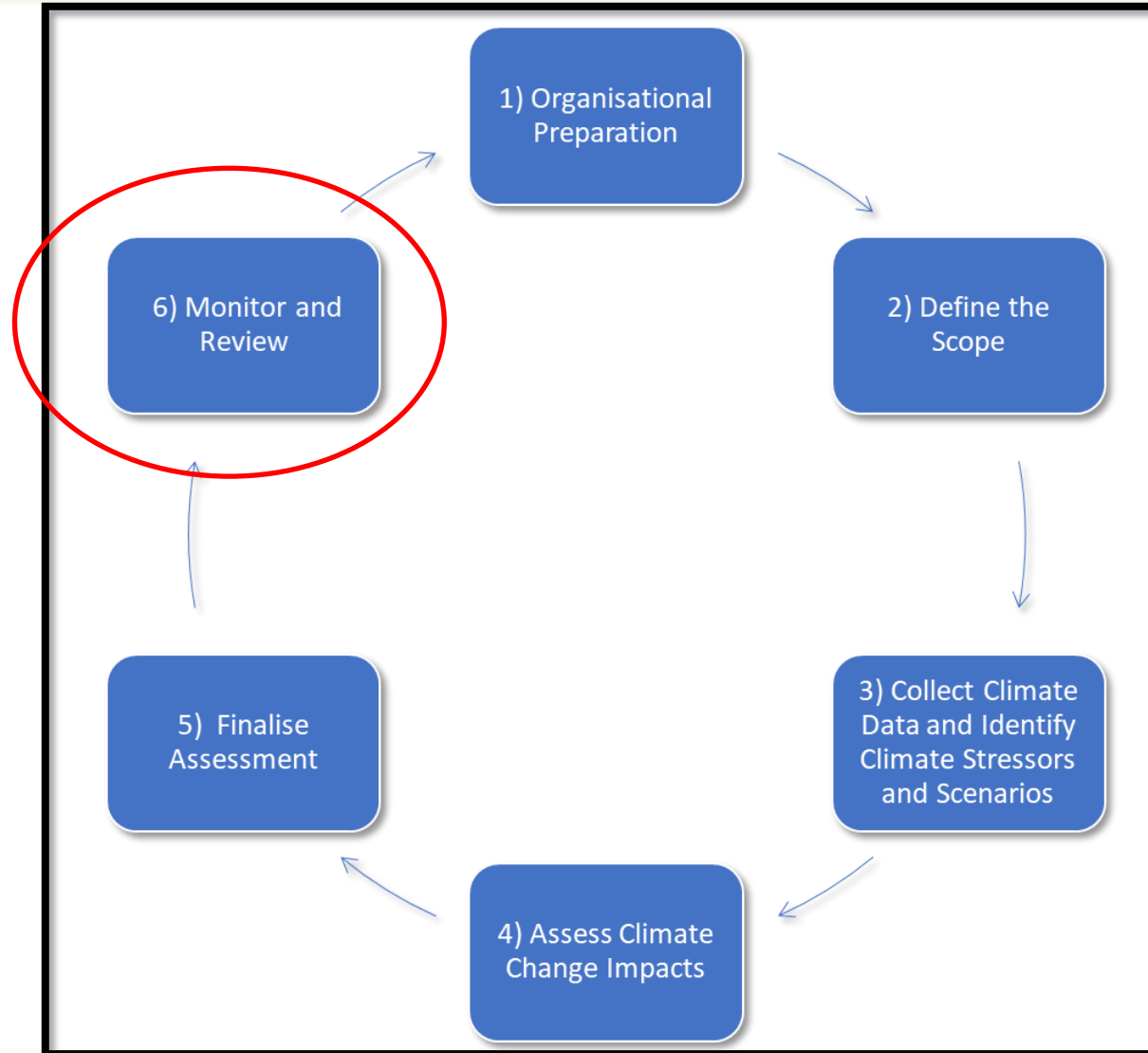


Key step 5: Finalising the Assessment in preparation for adaptation planning



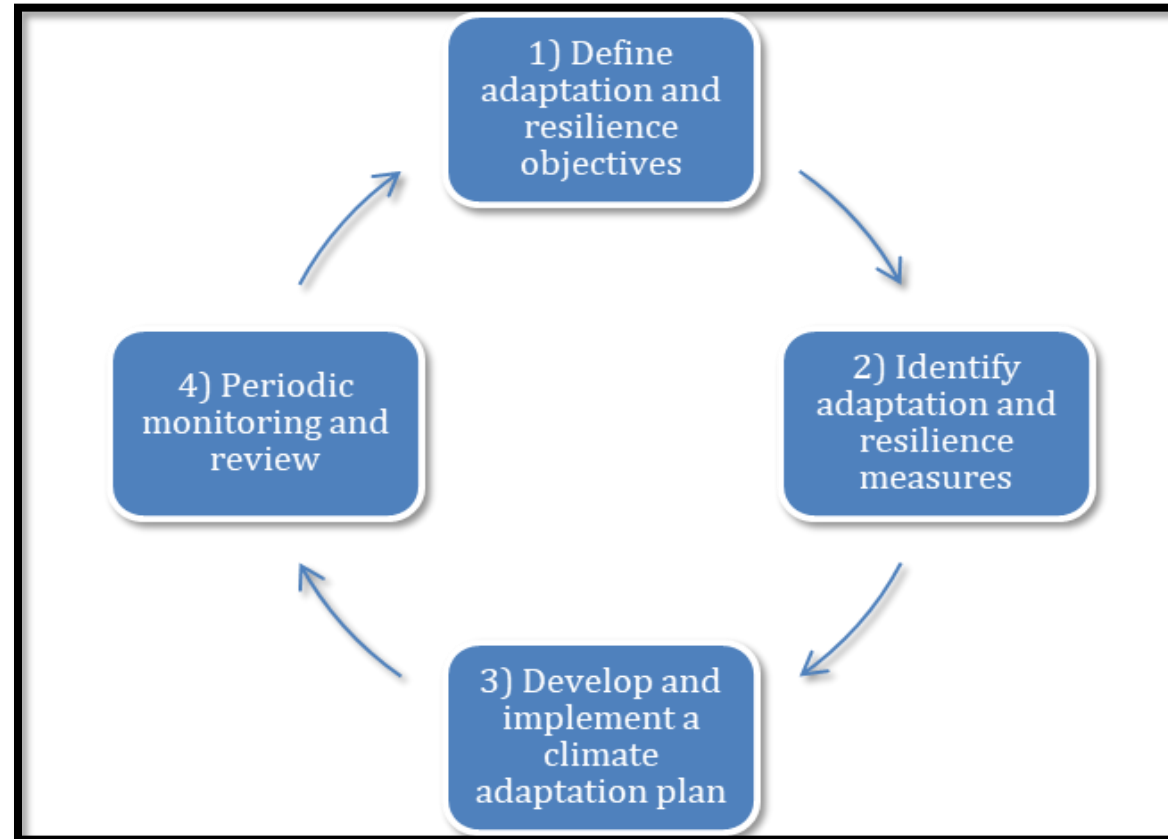


Key step 6: Monitor and review the assessment



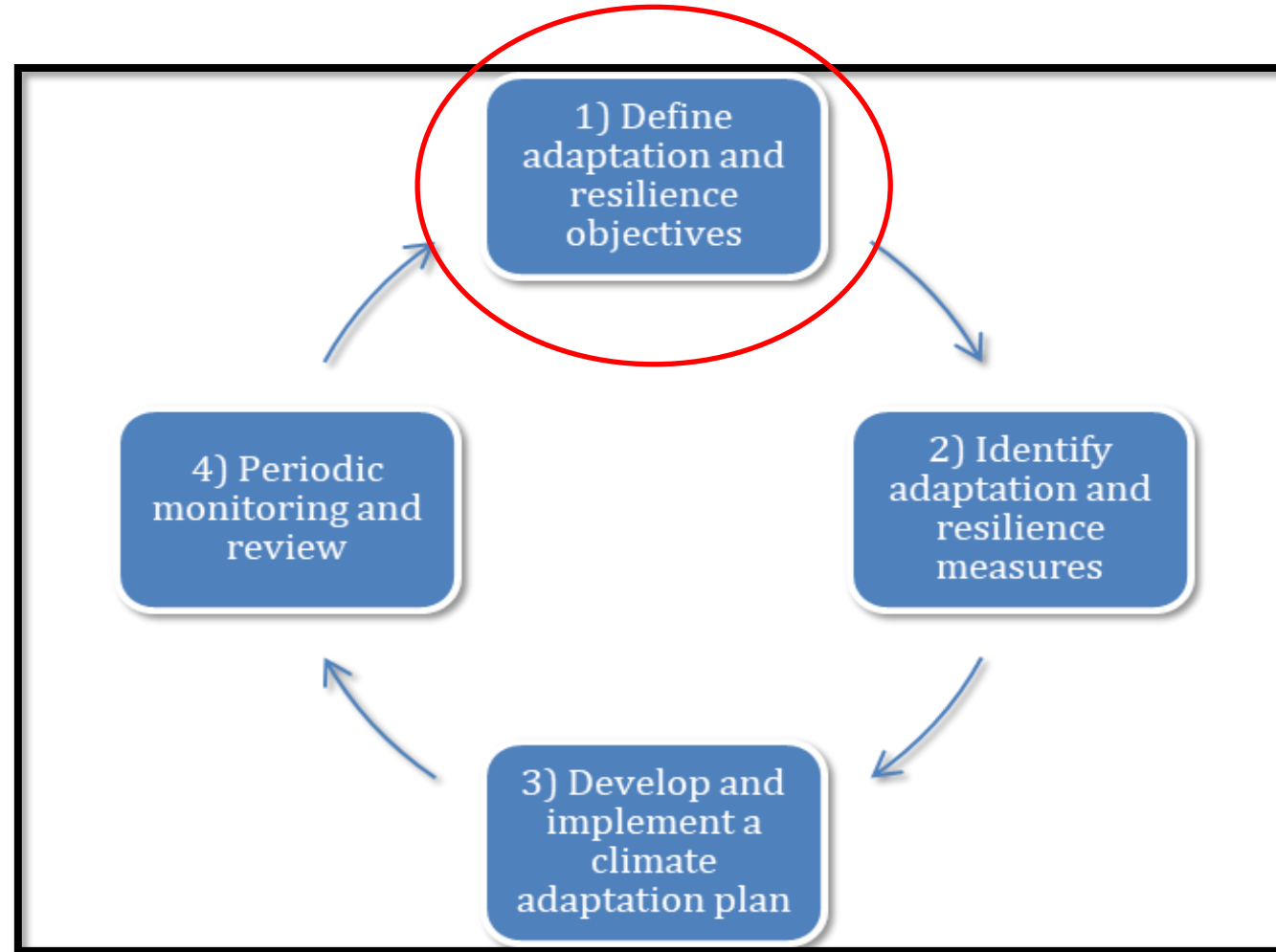


Stage 2: Key Steps for Aviation Organisation Climate Change Adaptation Planning



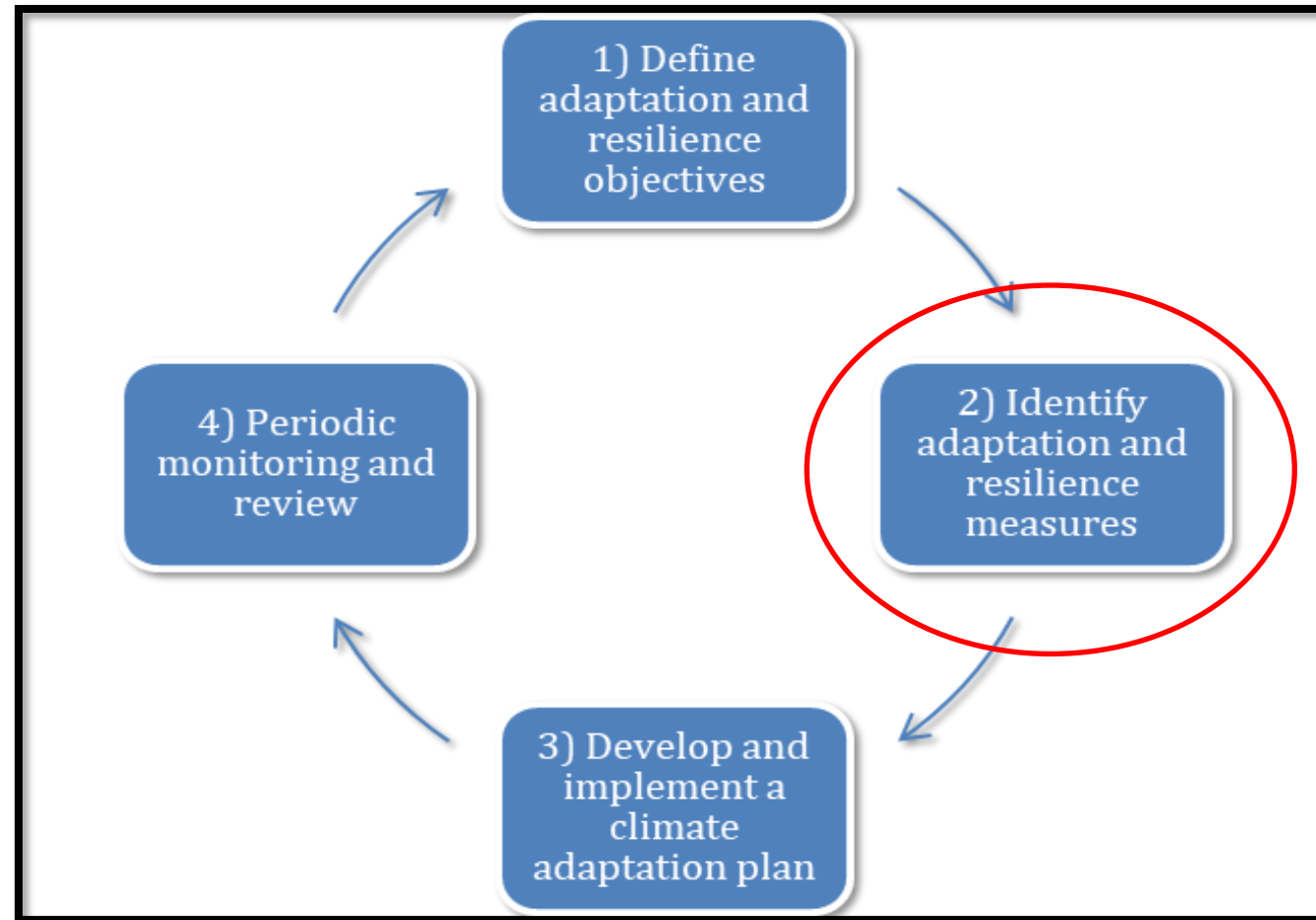


Key Step 1: Define adaptation and resilience objectives



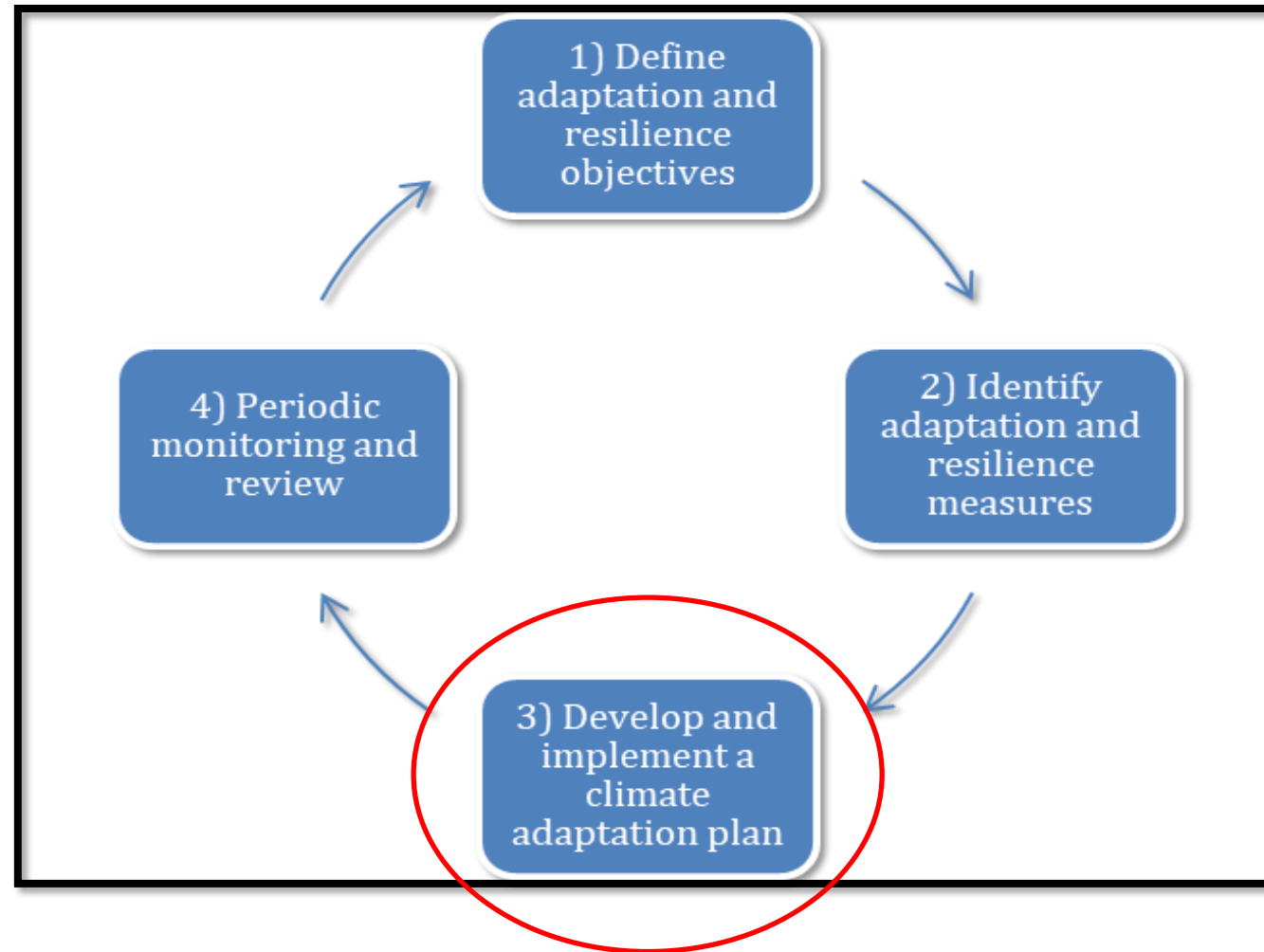


Key step 2: Identify adaptation and resilience measures to address prioritized vulnerabilities



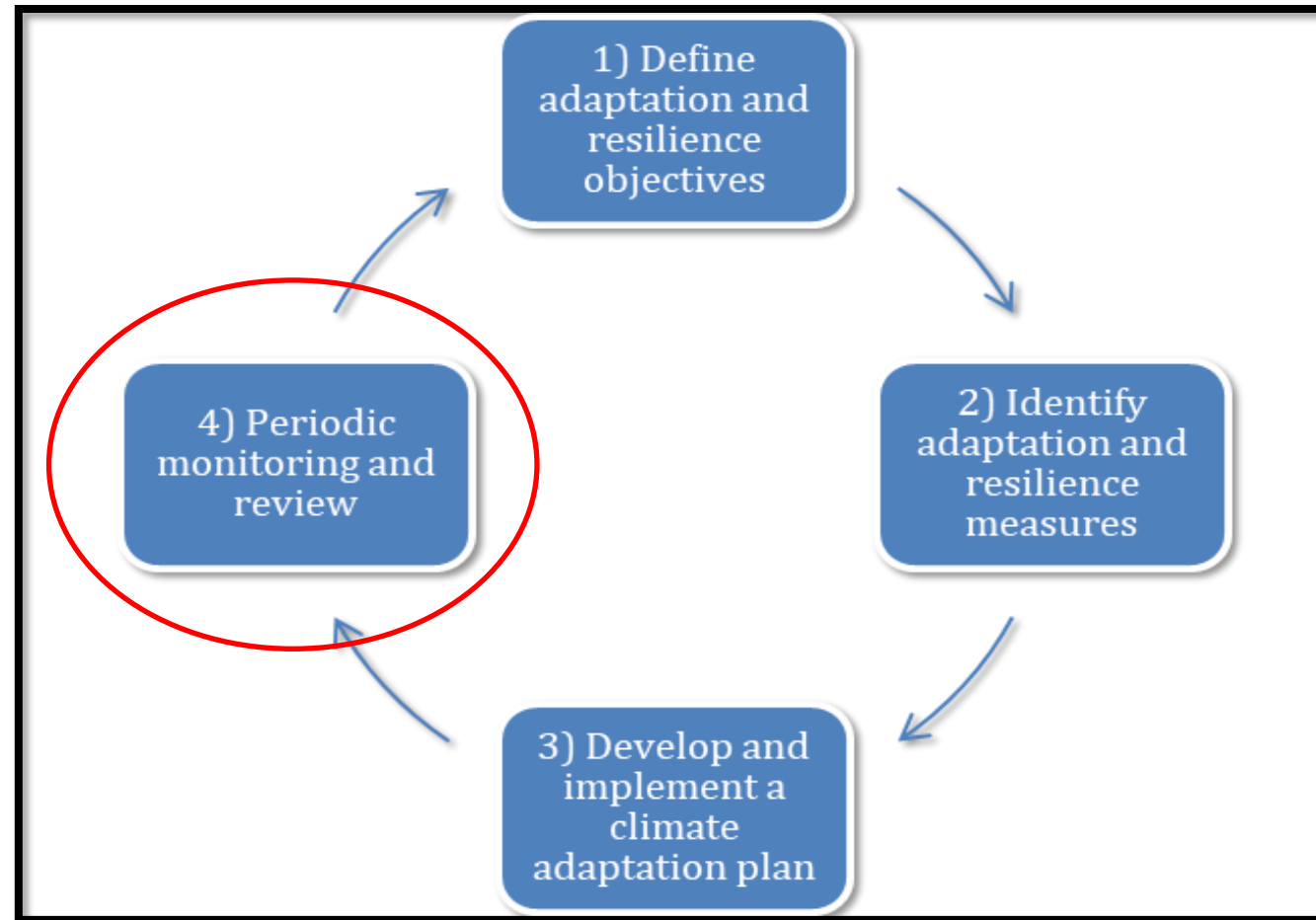


Key step 3: Develop and implement climate adaptation plan





Key step 4: Periodic monitoring and review





Key Climate Change Vulnerabilities for Aviation Organisations



This document provides an overview Key Climate Change Vulnerabilities for Aviation Organisations for the four climate change impacts categories which respondents to the [2018 ICAO Climate Adaptation Synthesis Report](#) stakeholder survey identified as the climate impacts categories they expect to be most affected by. These are: Higher Average and Extreme Temperatures, Changing Precipitation, Increased Intensity of Storms, and Sea Level Rise. For each organisation type (airports, air navigation service providers (ANSPs), aircraft operators), the document presents a breakdown of potential effects by impact category.



CAEP WG2 CLIMATE RISK ASSESSMENT, ADAPTATION AND RESILIENCE:
KEY CLIMATE CHANGE VULNERABILITIES FOR AVIATION ORGANISATIONS

Potential effects from four main climate impacts to aviation risk categories¹

Airports		
Climate Impact	Risk Category	Potential Effect
Higher Average and Extreme Temperatures	Operations	Runway length: <ul style="list-style-type: none">• Limits to operations due to reduced climb performance: higher temperatures reduce thrust and lift of aircraft during take-off, reducing take-off performance and requiring more fuel, or a reduction in overall weight.• Reduced ability of certain airports to take certain aircraft due to runway length limitations and reduced climb performance.



Menu of Adaptation Options



The document provides a menu of possible adaptation options which States and organisations can consider and select from to adapt to and build resilience against identified vulnerabilities. Small Island Developing States (SIDS) can face specific climate change vulnerabilities, especially due to storms and sea level rise, which makes adaptation measures particularly important. In the Menu adaptation options which may be critical for SIDS are indicated with a “**SIDS**” marker



CAEP WG2 CLIMATE RISK ASSESSMENT, ADAPTATION AND RESILIENCE:
MENU OF ADAPTATION OPTIONS

Adapting Airports

Higher Average and Extreme Temperatures

Operations

- Increase cooling capability in buildings
- Increase external air conditioning to match demand (e.g., air conditioning pumping cold air outdoors, or supply of pre-conditioned air to aircraft)
- Implement program to promote safety in the heat for ground staff – potentially extending to aircraft operator and ground handling staff
- Implement or update wildlife management plans to account for changes in wildlife impacts

Adelaide Airport in Australia is in a trial of irrigating the airport buffer, which may result in lowering airport surface temperatures and improving human thermal comfort.

Infrastructure

- Extend runway length
- Move obstacles at the end of the runway (to adjust for reduced take-off performance due to reduced thrust and lift)



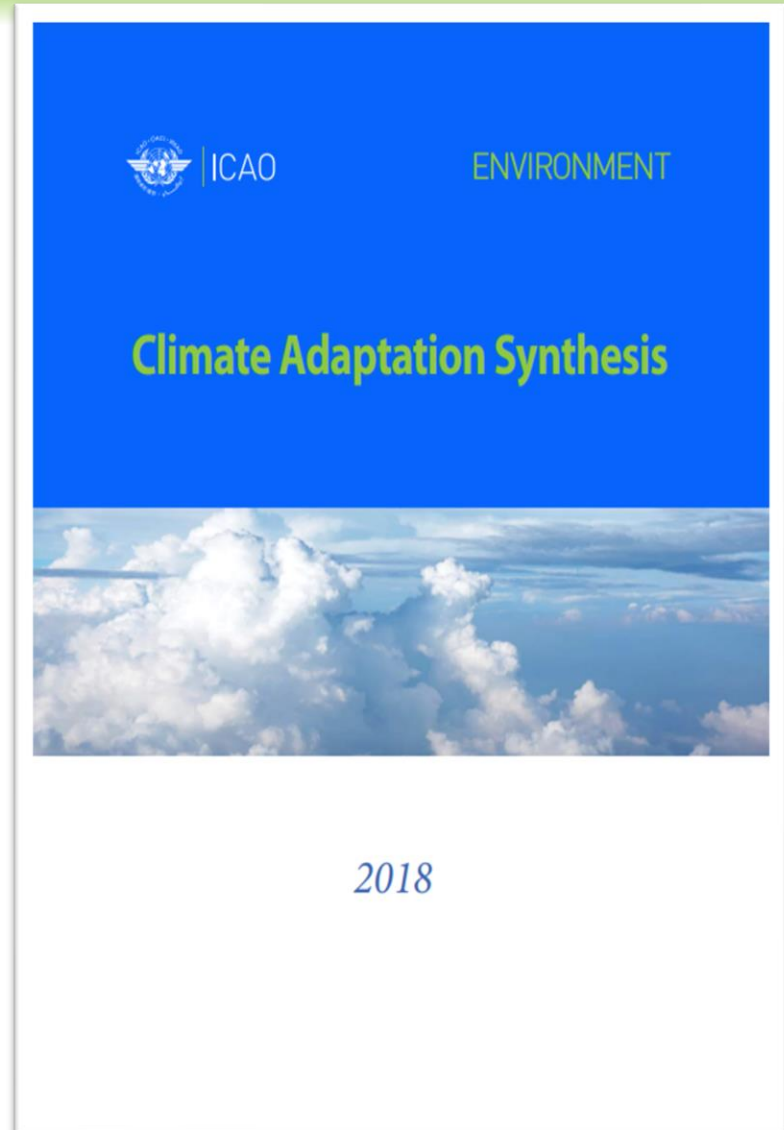
ICAO

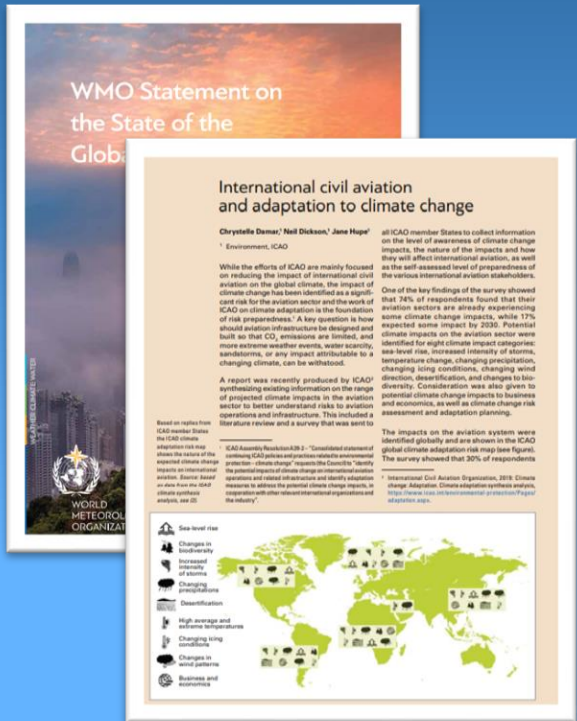
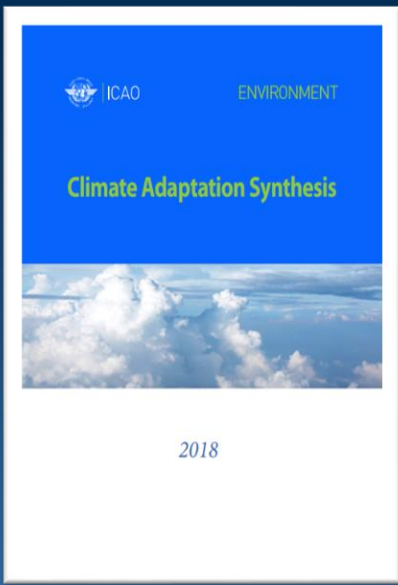
ENVIRONMENT

Next steps at ICAO



- Climate Adaptation Synthesis Review
- Stakeholder Survey update





<https://www.icao.int/environmental-protection/pages/adaptation.aspx>



ICAO

ENVIRONMENT



ICAO

North American
Central American
and Caribbean
(INACC) Office
Mexico City

South American
(SAM) Office
Lima

ICAO
Headquarters
Montréal

Western and
Central African
(WACAF) Office
Dakar

European and
North Atlantic
(EUR/NAT) Office
Paris

Middle East
(MID) Office
Cairo

Eastern and
Southern African
(ESAF) Office
Nairobi

Asia and Pacific
(APAC) Sub-office
Beijing

Asia and Pacific
(APAC) Office
Bangkok



THANK YOU



Q&A

Please ask your questions via the Q&A box



Thank you for joining us today!

Upcoming webinar:

Understanding and using the latest climate data to build resilience in the transportation sector

Tuesday, March 14th, 2023, 1:00 pm to 2:30 pm ET

Register here!

Laura Zimmermann

Policy/Economics Officer, Climate Change Adaptation Policy

Transport Canada

laura.zimmermann@tc.gc.ca