



APPENDIX E

Quick Start Handbook



Quick Start Guide:

Using Existing Airport Management Systems to Manage Climate Risk

Prepared for
Airport Cooperative Research Program • Project 02-74
Transportation Research Board of The National Academies

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Washington, DC • January 2018

This Quick Start Guide accompanies ACRP Research Report 188. The guide and handbook present a practical approach for airports to account for risks from a changing climate when assessing risks as part of existing management systems. Each chapter of the associated handbook provides additional detail and insights associated with the chapter subject area.

1.1 Who should use this Quick Start Guide?

- Do you manage airport infrastructure or services?
- Does weather affect the infrastructure or services that you manage?
- Does weather influence your airport's ability to operate?
- Do you wish to reduce the financial, operational, and safety risks at your airport?

If you answered “yes” to any of the questions above, this Quick Start Guide is for you. Even if your airport has not experienced extreme weather events in recent years, it is important to understand how the climate may change in your area and the associated vulnerabilities and risks to maintaining your day-to-day operations.

1.2 Why should my airport be concerned about climate change?

A changing climate creates uncertainty in the type, frequency and intensity of weather events that may occur. Recent trends at your airport may already be evident, such as

- Increased frequency of intense storms or microbursts,
- Longer lasting or more frequent extreme temperatures,
- Drought, and
- Flooding from higher tidal storm surges and increased sea-level rise threats.

New or different hazards resulting from changing climate conditions can create impacts to your airport both in the short- and long-term:

- Limiting the service life of existing infrastructure assets.
- Altering the type and frequency of emergency response situations. These could require added capacity to avoid service disruptions (e.g., flooding from microbursts that compromise worker safety and asset functionality).

- Expanding or shortening the tourism season for your community, resulting in new economic considerations.

Your airport may already have management systems that manage risk to severe weather and other hazards. You can use these existing systems to address your new impacts from a changing climate.

CLIMATE RISK

DEFINITION: The potential losses associated with individual or multiple climate hazards, defined in terms of expected probability and frequency, exposure, and consequences. Also known as *climate change risk* (ACRP 2015a).

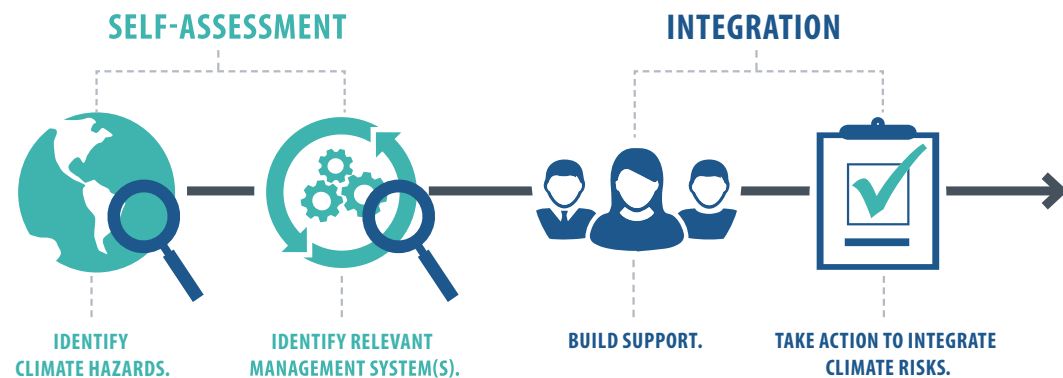
WHAT ARE THE BENEFITS OF INTEGRATING CLIMATE RISKS INTO EXISTING MANAGEMENT SYSTEMS?

- **Save on costs** for pavement repair, drainage system maintenance, and other weather-related costs.
- **Improve safety and security** for staff and passengers
- **Avoid being caught unprepared** for an extreme weather event
- **Avoid underestimating infrastructure sizing requirements**
- **Maintain compliance** with environmental, safety, and other regulations
- **Improve reliability and customer service**
- **Maintain continuity of operations** during an extreme event
- **Improve ability to recover** from an extreme event

1.3. How do I start managing my climate risks?

The following four elements, listed below and addressed in subsequent sections of this Quick Start Guide, are the key action items for managing climate risks using the common management systems in place at your airport.

The first two elements are part of a self-assessment process and the final two elements support integration into your management systems.



WON'T MY BUSINESS-AS-USUAL PROCESSES TAKE CARE OF MY CLIMATE RISKS?

Some business-as-usual processes, such as annual engineering assessments, can help you to stay on top of trends and impacts as they occur. This adaptive management approach is best suited to manage *gradually changing* risks over time. When climate change poses *immediate threats*, adaptive management may not be sufficient. This Quick Start Guide will help you identify opportunities to proactively address impacts.

2.0 SELF-ASSESSMENT



Your airport is unique. You have a set of established management systems used to conduct business, some of which may follow industry standards while others may be a less formal process. Your airport experiences “typical” weather that may change in the future due to a changing climate. And the team at your airport is already familiar with addressing and mitigating risks.

2.1 What are my relevant climate hazards?

Information on the anticipated local climate hazards is available from numerous sources—so many, in fact, that many airports find it overwhelming. The following steps are intended to simplify that process:

USE THIS INFORMATION TO FILL OUT COLUMNS A AND B OF THE SELF-ASSESSMENT WORKSHEET

1. If you have little previous exposure to the topic of climate change and the associated impacts, **review the [National Climate Assessment \(NCA\)](#) chapter for your region** for a high-level overview. If you are already familiar with this information, continue on.
2. Use the [ACRP Airport Climate Risk Operational Screening \(ACROS\) Tool](#) to gather detailed, airport-specific projections of climate hazards and associated impact to your infrastructure assets.



SHORTCUT! Without going through the full tool to evaluate climate risks, you can use the ACROS tool to gather climate projections for your airport in less than 10 minutes:

- 1 Open the ACROS tool
 - 2 Enter your airport code
 - 3 Click the “Reports” button at the bottom left pane to generate a summary table of the climate hazard projections at your airport
- 3. Check whether there have been other climate change assessments in your location.** For example, check with your local city government or university for existing published studies. These may provide additional information beyond the ACROS tool.

4. If your airport is coastal, look for information on whether any parts of your airport or its access roads could be affected by sea level rise. Check the following sources of information:

- » **Locally-specific studies** – Many coastal areas have existing sea level rise mapping studies that consider local land elevations, vertical land movement rates, expected sea level changes rates in the area, and local coastal processes. Check with your state or local government offices and nearby universities for existing sea level rise assessments.
- » **NOAA** – If no locally-specific studies are available, the [NOAA Sea Level Rise Viewer](#) is a tool to visualize community-level impacts from coastal flooding or sea level rise (NOAA 2017).

The answers to these questions and completion of the **Appendix A – Self-assessment Worksheet, located in the accompanying handbook** is your first step in this process. The self-assessment will help you understand your airport-specific climate hazards; the risks these hazards pose to operations, workers and passengers; and which of your existing management systems are best for managing these risks. **Please see Chapter 2 of the handbook for more self-assessment details.**

2.0 SELF-ASSESSMENT



2.2 What are my expected climate risks?

Now that you have information on anticipated local climate hazards, evaluate what risks these pose to your airport. The degree of risk depends on: the magnitude of change for each climate hazard, the sensitivity of your airport infrastructure and operations to those changes, and your preparedness to adapt.

USE THIS INFORMATION TO FILL OUT COLUMNS C, D, AND E OF THE SELF-ASSESSMENT WORKSHEET

1. High-level risk assessment is appropriate if you are not ready to spend time on a more detailed risk assessment. Work with others in your airport to evaluate how the projected climate hazards could disrupt service, cause safety concerns to airport workers or passengers, and change service demand (e.g., tourism season variations), among other items.



TIP! Default results from the ACROS tool provide a structured process for conducting a risk screening to identify what's most at risk to projected climate change (ACRP 2015a).

2. For a more **detailed risk assessment**, involve staff from multiple departments to assess and prioritize risks by completing the **ACROS tool**. The tool includes sequential screens where users rate the criticality (i.e., importance) and vulnerability on their assets to the hazards.



2.3 Which of my management systems should I use to address my climate risks?

Consider the different types of management systems you regularly execute at your airport. Different management systems may be more appropriate for managing different types and levels of risk. For example:

Strategic Planning	Well-suited to manage multi-discipline, potentially existential risks to the airport, such as the risk of long-term inundation from sea level rise or the potential for significant changes in passenger or other use demand
Master Planning	Useful to manage long-term infrastructure risks that can impact forecasted service levels, such as those from extreme temperatures, sea level rise or flooding
Enterprise Risk Management	Applicable to holistically address risk identification, planning and response coordination across the airport, such as those addressing airport service reliability
Safety Management	Well-suited to manage safety-related risks, such as extreme heat and the health effects on workers
Capital Planning	Applicable to address infrastructure management and investment through a multi-year approach that ensures basic safety, security and operational efficiency and maximizes economic potential
Asset Management	Well-suited to manage the status of existing assets and infrastructure, as well as risks related to changes in operations and maintenance costs
Emergency Management	Useful to manage risks from operational changes due to extreme events (e.g., new risk of wildfires or ice storms)

Select the management system(s) that are best suited to address your identified risks. Climate risks likely can be addressed using any of the above common management systems. **Refer to Chapter 2.3 of the handbook for additional explanation.**

3.0 BUILDING SUPPORT



Before you can identify, develop, and propose climate risk integration strategies at your airport, you may need to build support and consensus. The following strategies can help you build the support you need. Chapter 3 of the handbook presents additional strategies and examples.

–Template for Communicating with Airport Leadership.

3.1 Identify a champion

Climate risk management initiatives may be most successful when there is a specific individual or team that generates support and excitement. This champion, or champions, drive climate risk integration across your airport so that it is considered in each management system planning cycle. The role of this champion is not to single-handedly do all the work, but to gather the support that is needed, foster collaboration, and sustain momentum for the effort.

3.2 Define roles and responsibilities

Clearly defining the responsibilities of involved individuals and their specific tasks is important, especially when starting out. This efficiently and effectively helps each individual to understand and take actions in their departments that align with the champion's objective.

3.3 Make the case to executive management

Securing the buy in of airport executives and senior management on the long-term value and benefits of your effort creates alignment on multiple levels. To start, executive leadership sets the priorities for individual departments. Executive management also has a broad view of the organization and may provide insight and access to resources to further refine how climate risks are addressed internally.

A template and guide for speaking with executive management is included in the **handbook's Appendix B, Template for Communicating with Airport Executives.**

3.4 Build support across airport departments

Building an awareness of the risks from changing climate conditions will require a coordinated and persistent approach. The end goal is to develop consensus and share information to account fully for these risks. Engaging executive management to assist with facilitating this coordination is encouraged, where feasible.

Communicate to the different levels of management within your department the value, benefits and available information already collected to date (as part of the self-assessment process) to build momentum for continued engagement. From there, find opportunities to connect with other departments. You may find you are not the only person actively seeking to integrate climate risk, and other teams may have begun efforts.

3.5 Coordinate with external stakeholders

Airlines, other commercial airport tenants, fixed base operators (FBOs), and concessions (i.e., external stakeholders) are dependent on airports to maintain business continuity. Coordinating with these stakeholders allows you to address indirect climate risks that cannot

be directly mitigated by your airport. These risks might range from energy and water supplies to road access.

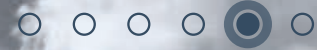
3.6 Communicate effectively

Keeping your message straightforward, focused, positive, and solutions-based will increase understanding.

Effective strategies to communicate climate risks within your airport include:

- 1. Focus on risks from climate change, not the causes.** The science behind the forces that create climate change can be challenging to communicate, and sometimes can create tension. Focusing instead on the risks, and those risks specific to your airport and region, can simplify this message.
- 2. Keep the message positive.** A proven approach is to focus your message on what CAN be done to mitigate risks from climate change, whether as an individual or team. When people feel they are empowered to address a risk, they are more likely to act.
- 3. Focus on why this matters to your audience.** The risks to any particular airport functional area may vary. While keeping your core points and objectives the same, tailor your message when addressing different audiences. For example, planners involved in emergency management will better relate when the focus is on risks and hazards associated with frequency and intensity of severe weather events, while asset management personnel will be more interested in impacts to infrastructure maintenance and operational reliability.

4.0 USING MANAGEMENT SYSTEM FLOWCHARTS



You have completed the self-assessment, identified the climate hazards and evaluated the associated risks to your airport. You have buy-in from the appropriate decision makers. **Well Done!** Now one of your management systems is ready to begin the planning cycle. Let's get started.

QUICK START GUIDE'S AIRPORT MANAGEMENT SYSTEMS

- 5.1 STRATEGIC PLANNING
- 5.2 MASTER PLANNING
- 5.3 ENTERPRISE RISK MANAGEMENT
- 5.4 SAFETY MANAGEMENT
- 5.5 CAPITAL PLANNING
- 5.6 ASSET MANAGEMENT
- 5.7 EMERGENCY MANAGEMENT

4.1 What are management system flowcharts?

The Quick Start Guide includes a flowchart overview of the main steps in each of the seven common management systems. The steps are organized into the International Organization for Standardization (ISO)'s Plan-Do-Check-Act framework (ISO 2015). This 4-step framework helps you align the flowchart steps with your own planning process, even if you do not have a formal management system or follow the steps exactly as outlined. A simplified flowchart is also presented (following page) to illustrate the various components.

Depending on the selected management system and your preferred level of climate integration, some climate entry points may be more relevant than others. This is an opportunity to account for, or integrate, climate risks into the management system(s) you regularly update. **Chapter 4 of the handbook provides details to maximize each entry point.**



PLAN ►

- Define scope and objectives.
- Collect and analyze data.
- Identify risks/problems.
- Develop a plan to solve problems/meet objectives.

DO ►

- Implement plan.

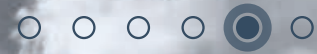
CHECK ►

- Verify plan meets objectives by monitoring and measuring progress.

ACT ►

- Improve process effectiveness based on findings.
- Integrate with future decision-making.

4.0 USING MANAGEMENT SYSTEM FLOWCHARTS



4.2 How do I use the management system flowcharts?

Step 1. Identify the management system. - Referencing the list of 7 common management systems, select the system you will be reviewing. Locate the associated flowchart in Section 5.0 of this Quick Start Guide.

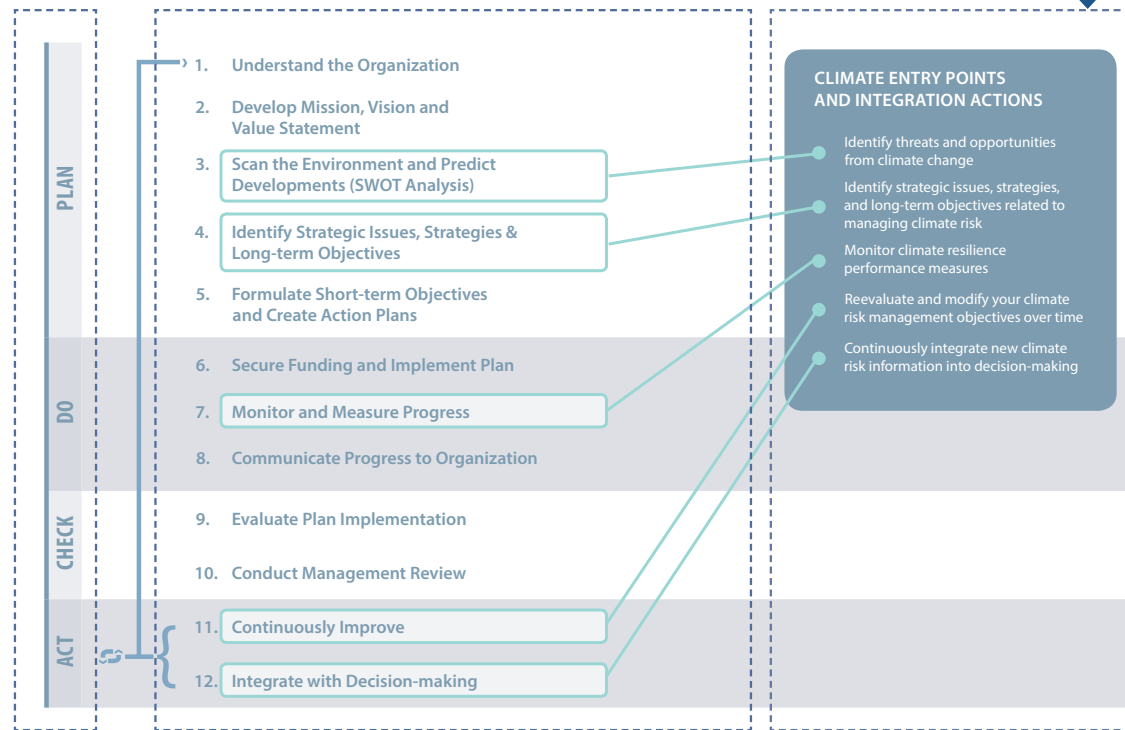
Step 2. Review the management system flowchart for climate entry points. – You are likely familiar with the typical steps you take when creating a system and implementing the system for any particular topic area. Compare your typical process with the detailed flowchart. Identify the steps with a corresponding climate entry point and integration action and determine those that apply to your tailored implementation of your management system.

Step 3. Execute the management system – Complete the plan-do-check-act steps of your management system as you typically would and account for climate risks at the pre-identified climate entry points. Look for opportunities to coordinate with other management system data collection and prioritization. For example, end of life data collected during asset management system implementation may inform the prioritization of funding determined during the capital planning process.

Step 4. Continuous improvement – Each time the management system planning cycle commences, consider new or different risks from updated climate change data.

HOW TO READ YOUR FLOWCHART

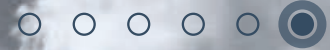
CLIMATE ENTRY POINTS AND INTEGRATION ACTIONS -These describe the climate-related risk assessment steps, or climate entry points, along with the corresponding suggested action(s) during that step



4 Steps of the
Plan-Do-Check-Act Cycle

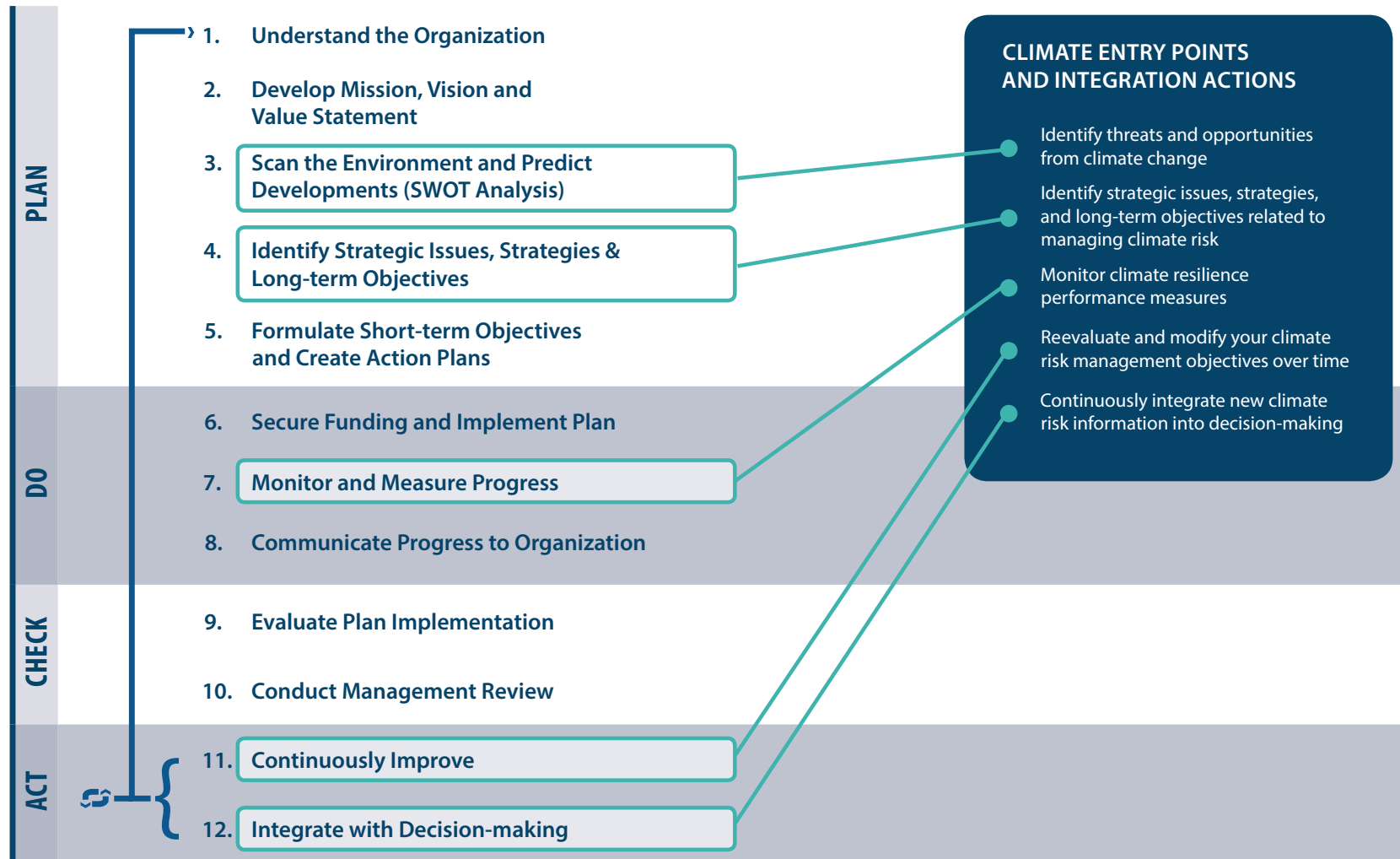
TYPICAL STEPS followed to complete the development of a system, implement the system, verify the system is meeting objectives by monitoring and measuring progress, and communicating outcomes to integrate system revisions

5.0 SYSTEM INTEGRATION STRATEGIES



5.1 Strategic Planning

Refer to Section 4.1 of the handbook for additional information.

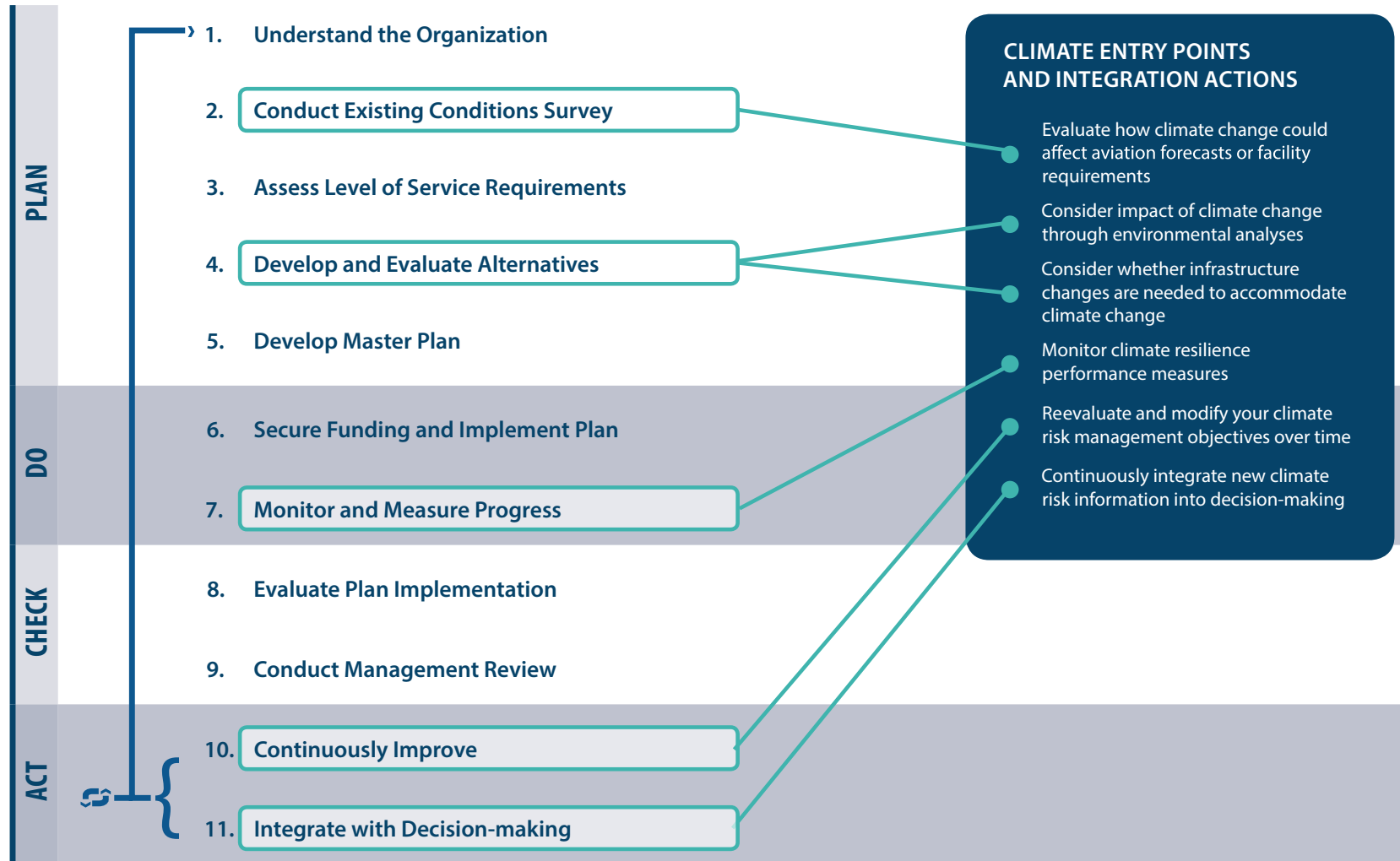


5.0 SYSTEM INTEGRATION STRATEGIES



5.2 Master Planning

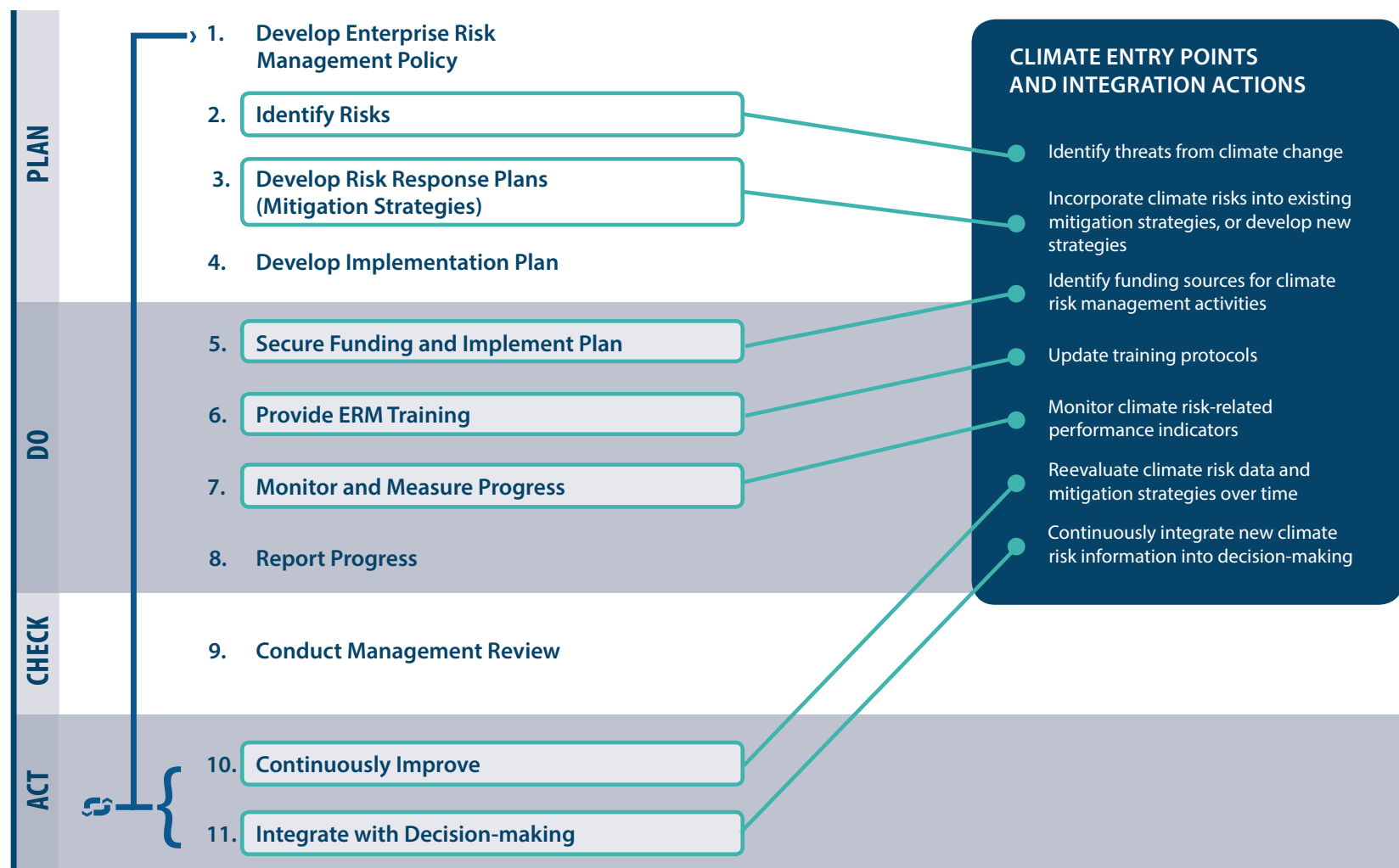
Refer to Section 4.2 of the handbook for additional information.



5.0 SYSTEM INTEGRATION STRATEGIES

5.3 Enterprise Risk Management

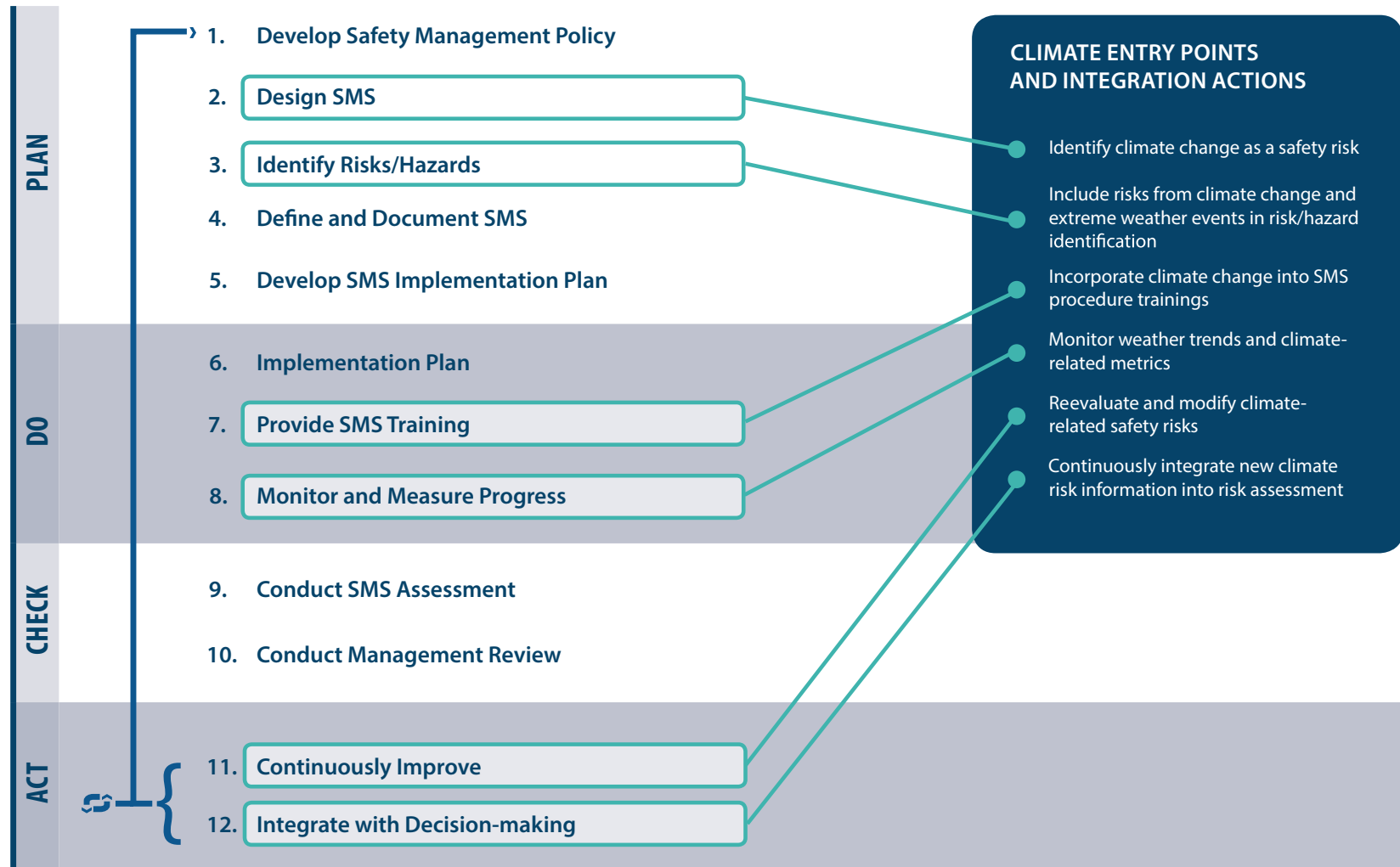
Refer to Section 4.3 of the handbook for additional information.



5.0 SYSTEM INTEGRATION STRATEGIES

5.4 Safety Management

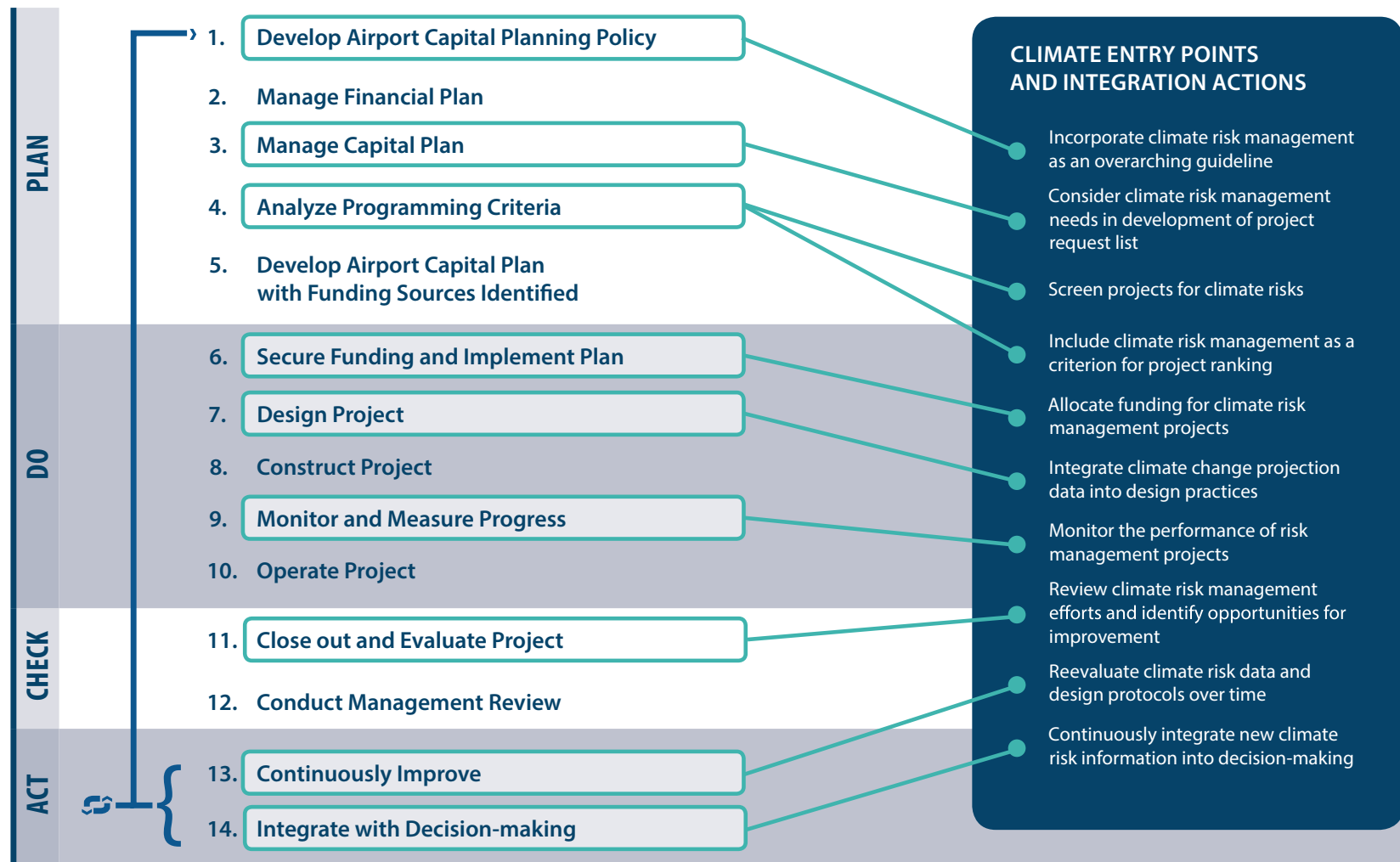
Refer to Section 4.4 of the handbook for additional information.



5.0 SYSTEM INTEGRATION STRATEGIES

5.5 Capital Planning

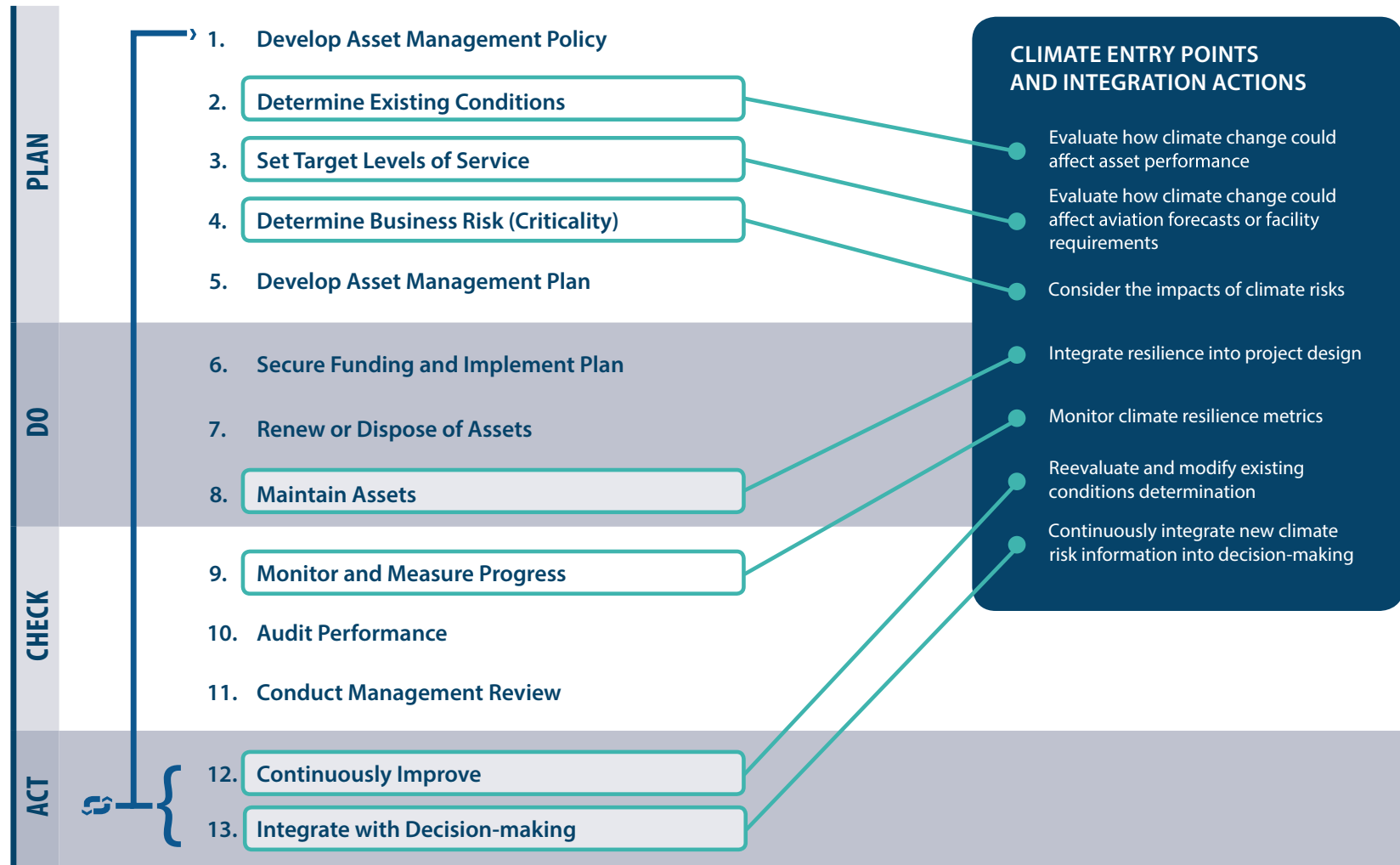
Refer to Section 4.5 of the handbook for additional information.



5.0 SYSTEM INTEGRATION STRATEGIES

5.6 Asset Management

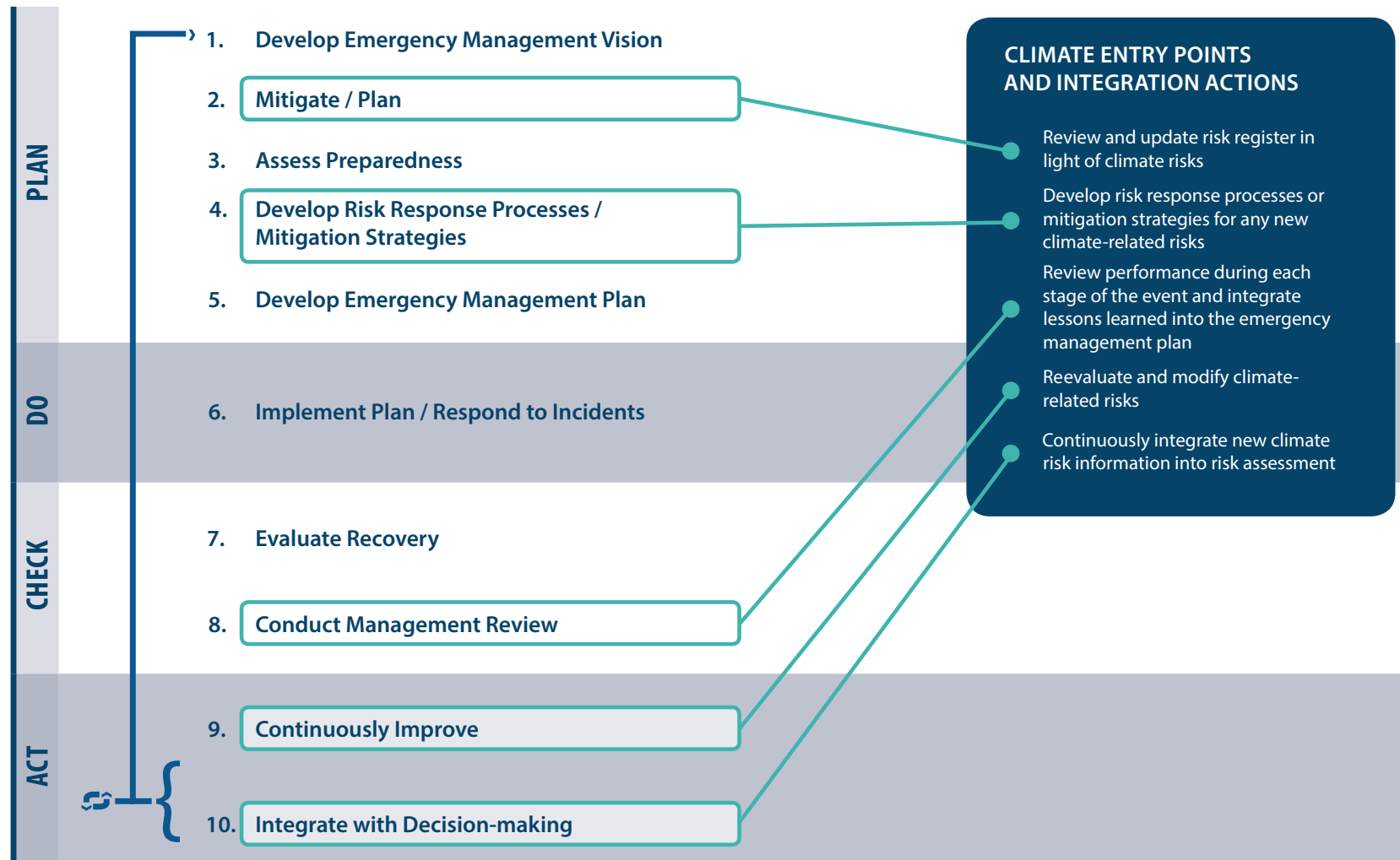
Refer to Section 4.6 of the handbook for additional information.



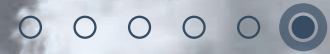
5.0 SYSTEM INTEGRATION STRATEGIES

5.7 Emergency Management

Refer to Section 4.7 of the handbook for additional information.



5.0 SYSTEM INTEGRATION STRATEGIES



5.8 Cross-cutting Adaptive Management Strategies

Refer to Section 4.8 of the handbook for additional information. In addition to the system-specific strategies, begin tracking and regularly reviewing data so that you are aware of changes in trends and are ready to respond to climate risks as they become increasingly prevalent.

EXAMPLE STRATEGIES INCLUDE:

IDENTIFY DATA METRICS

Begin tracking data metrics, such as those listed below, to detect changes in local climate conditions. This will help to understand the true costs to your airport. You may be tracking some of these metrics already, but not in terms of climate change. Align your data metrics with your priority climate risks and management systems identified in the self-assessment.

USE EVENT EXPENSE CODES

Use event codes to track labor, materials, and other costs associated with event preparation, response, and recovery. By assigning a code to a specific weather event, you can assess the severity of the impacts and costs to easily compare the event to others.

USE EXISTING (OR CREATE NEW) ANNUAL PROCESSES TO REVIEW DATA

You may already have an annual process in place that can be modified to include climate-related data metrics. If you do not, consider creating a simple annual review process to monitor changes in trends.

IDENTIFY A TIPPING POINT

As you begin tracking these metrics, identify a tipping point when your airport will begin thinking about, and planning for, long-term changes. The tipping point value should be reflective of what your airport deems to be a significant change in the frequency or severity of events requiring a potential change in your management processes. If your airport reaches a tipping point, you should transition from monitoring conditions to actively implementing risk strategies.

See the handbook for additional information.

DATA METRIC	TRACKING FREQUENCY
ASSET PERFORMANCE	
Duration of damage or closure (i.e., how long asset was out of service)	For each event
Pavement condition (such as occurrences of buckling, rutting, and cracking on runways and other paved surfaces)	Annually
OPERATIONS	
Changes in energy usage	Annually
Number of weather-related flight delays or cancellations	Annually
OVERALL EXPENDITURES	
Quantity of staff time spent preparing for, responding to, and recovering from weather events	For each event
Cost of damages to infrastructure and facilities	For each event
WEATHER EVENT FREQUENCY AND SEVERITY	
Frequency of storm events (e.g., thunderstorms, hurricanes, snow storms, and other severe weather)	For each event
Frequency of extreme temperatures (e.g., heat waves or cold fronts)	For each event

