ABOUT THIS GUIDE

This guide was developed by the ACEC-BC Sustainability & Climate Change Committee to support infrastructure owners to consider climate change in development of project scope and procurement of consulting engineering planning and design services.

Guidance includes:

- Terminology
- Guiding questions for Owner organizations, such as:
    - How can you define your project objectives with respect to climate change?
    - What are climate change key performance indicators (KPIs) that help to meet the project objectives?
    - What is an acceptable level of understanding of climate uncertainty for the project?
    - Are there key climate change parameters for the project?
- Additional considerations

The objective in developing the guide is to enhance projects' long-term resilience and sustainability by ensuring that relevant climate factors are adequately considered and communicated with respect to the expected level of service of a project.

1.0 TERMINOLOGY

Adaptation, mitigation, and improving resilience are all approaches to addressing the impacts of climate change that consultants can review during design and, depending on the project, are required to consider when applying the standard of care[1]. A brief definition of each of these terms is provided below, courtesy of Engineers Canada's *Public guideline: Principles of climate adaptation and mitigation for Engineers*. These definitions provide a clear understanding of the similarities and differences between the terms to assist with interpreting the subsequent guiding questions.

- *Adaptation to climate change:* An adjustment in natural or human systems in response to actual or expected climatic changes, which moderates harm or exploits beneficial opportunities.
- *Mitigation (with reference to climate change):* Technological change and changes in activities that reduce greenhouse gas emissions or enhance removal of greenhouse gases from the atmosphere, thereby reducing the anthropogenic emissions causing climate change.
- *Resiliency:* The ability of a system to withstand stress, adapt, recover from a crisis or disaster, and move on. Resiliency is the societal benefit of collective efforts to build collective capacity and the ability to withstand stress, including that caused by a changing climate.

An additional definition from the National Guide to Sustainable Municipal Infrastructure (NRC) is provided below.

- *Level of Service:* Levels of service reflect social and economic goals of the community and may include any of the following parameters: safety, customer satisfaction, quality, quantity, capacity, reliability, responsiveness, environmental acceptability, cost, and availability. The defined levels of service are any combination of the above parameters deemed important by the owner organization.[2]

In short:

Adaptation – preparing for and adjusting to the impacts of climate change.

Mitigation – reducing a project's contribution to the causes of climate change.

Resiliency – enhancing the ability of systems to withstand and recover from the impacts of climate change.

Level of Service – the ability to maintain a defined extent of service delivery.

Additional relevant definitions from the Engineers Canada guideline include:

- *Risk Tolerance:* The amount of climate change related risk the client is willing to accept.
- *Vulnerability:* The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate, including climate variability and extremes or any other natural events or man-made activity.

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1 Association of Consulting Engineering Companies – BC. Climate Change and the Standard of Care. December 2024

2 Developing Levels of Service: A best practice by the National Guide to Sustainable Municipal Infrastructure". Federation of Canadian Municipalities and National Research Council. 2002.

2.0 GUIDING QUESTIONS FOR OWNER ORGANIZATIONS

Guiding questions are intended to stimulate discussion within Owner organizations regarding how to address climate change-related requirements in projects. The questions will help to define requirements that may be included in the procurement of consulting engineering services necessary to deliver projects on behalf of the Owner.

Understanding the desired *Level of* Service and *Risk Tolerance* for the project is critical for the Project Owner to understand before reviewing the guiding questions. This *Risk Tolerance* is usually closely linked to the Owner organization's Risk Tolerance as a whole, and therefore is a necessary first step for the Owner organization. Most owner organizations will understand their level of acceptable project risk; however, resources are available which help define project risk from a climate change perspective, including:

- The Climate Risk Institute
- The Public Infrastructure Engineering Vulnerability Committee (PIEVC) Protocol

Figure 1 is the suggested workflow for use of the guiding questions. By establishing clear project requirements, consultants can then plan and price their work effort with greater certainty.

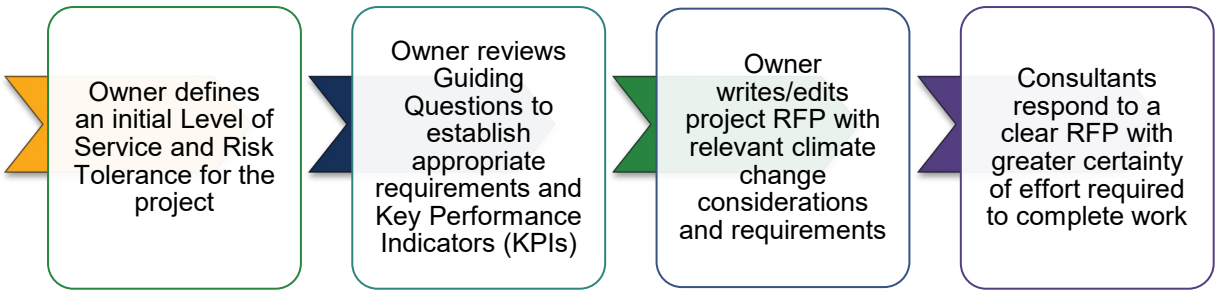

Figure 1 Suggested Workflow – Guiding Questions

Guiding Questions

1) How can you define your project objectives with respect to climate change?

For example, limit damage from flooding, prevent deaths or damage during extreme heat events, wildfire smoke events, etc.

Questions to help the Owner define the climate change-related objectives:

- How is the project at hand part of a potential solution or exacerbation of climate change?
- What are the consequences of failure or inability to utilize this project during its lifespan?
    - Could climate change increase the frequency of these failures?
- Has a climate change risk assessment been completed for the project?
    - If yes, can it be provided to the proponent, or are there relevant impacts defined that should be included in the consultant procurement?
    - If not, do you want the proponent to complete one for the project?
- Does your organization have a climate change strategy that requires specific requests from proponents, e.g., carbon emission of the project?
- How important is it for the supply chain, including consultants and manufacturers, to play a part in reducing impact to or regeneration of the environment?
- What mitigation, adaptation, and resiliency strategies are relevant to this project?
- What are the relevant publicly available research or publications relating to the project type/scope and climate change that the proponent should reference?

2) What are climate change Key Performance Indicators (KPIs) that help to meet the project objectives?

Typical KPIs relate to the *Level of Service* and associated minimum/maximum targets.

Examples of KPIs for various project types include (non-exhaustive list for illustrative purpose):

Buildings:
• Maximum Total Energy Use Intensity (kWh/m^2) • Thermal Demand Intensity (kWh/m^2) – the lower the value, the less energy is required to maintain a heating set point (resilience)
Flood Management
• Project life span and return period (from standard code) or an acceptable level of risk standard (Flooding binary-> Risk considers consequence and time frame)
Structures/Bridges
• Importance level of a bridge (e.g. is it part of a disaster relief route, etc.)

Transportation
• Asphalt longevity (using freeze-thaw cycles)
General
• Project life span (or alternatively, study duration of X years) • Importance • Consequence level • Level of Risk • Evaluation of relevant risks due to climate change - Qualitative vs. Quantitative • Lifecycle cost • Capital cost • Embodied carbon quantification and/or GHG reduction relative to a baseline.

The International Council for Local Environmental Initiatives (ICLEI) Canada maintains a list of indicators as well as additional guidance on establishing indicators that may also be useful.

3) What is an acceptable level of understanding of climate uncertainty for the project?

For example, is a qualitative assessment acceptable, or do you want a detailed and quantitative analysis? Note that the analysis level of effort and associated costs vary dramatically between these two options.

Questions to help define what level of uncertainty is acceptable:

- What level of detail in the assessment is required for the project?
- Does the analysis complexity match the level of uncertainty?
- How sensitive are the results of the assessment to the uncertainty in climate projections?
- Should the analysis rely on a range of climate scenarios, or is a single projected future sufficient?

If the Owner is unsure about the answers to these questions (and any other questions raised throughout this document), holding an open meeting for questions during the RFP (Request for Proposal) process is recommended. Such a meeting will allow the Owner to provide further project clarification to proponents and provide proponents the opportunity to ask questions to obtain more detail about the project, thereby being able to scope the project more effectively.

4) Are there key climate change parameters for the project?

Examples of parameters to be defined include:

- Change in precipitation. Extreme or annual?
- For predicting future climate outdoor air temperatures: there are several climate change scenarios available, such as 0.5, 1.0, 1.5, and 2.0 degrees of average temperature rise.
- Should proponents provide only Scope 1 emissions (those owned and controlled by the Owner organization) or include Scope 2 (caused indirectly by energy purchase and uses), or Scope 3 (not produced by the Owner organization or the result of assets owned or controlled by the Owner, but those emissions produced indirectly by those up and downstream of the Owner's value chain). More information on GHG accounting standards is available from GHG Protocol.

Reviewing these questions will help to determine the parameters:

- Are there consistent minimum standards set by the organization, and is there an allowance for proponents to suggest additional ones?
- Which climate change scenario(s) do you want proponents to use? Or should they decide what is appropriate?

3.0 ADDITIONAL REQUIREMENTS

While the above questions relate to climate considerations for the project itself, Owner organizations may also determine if there are internal climate-related requirements from their own organizations that might impact procurement. These might include:

- Environmental, Social and Governance (ESG) strategy
- Climate action plan
- Other equivalent directives/strategies.

Documents like these often contain requirements for proponents to include other information and/or documentation to meet specific criteria to provide services to the Owner organization. Examples of these organizational requirements might include:

- British Columbia Social Procurement Initiative (BCSPI)
- Carbon emission reporting from the proponent.

External requirements can also impact projects. For example, some funding providers require a Climate Lens Assessment to be undertaken and this may need to be included in the procurement of the project if it has not already been completed by the Owner.

For further information on climate change related tools and resources, visit the Engineers and Geoscientists BC Climate Change Information Portal.

4.0 CONCLUSION

The ACEC-BC Sustainability & Climate Change Committee's intention in developing this guide was to engage and support Owners who are ready to initiate internal discussions on climate resilience and improve the definition of requirements for engineering projects. By addressing key terminology, posing guiding questions, and assisting in the definition of project-specific key performance indicators, the document is a framework for integrating climate change considerations into requests for proposals. Integration of climate change considerations into RFPs is one step Owners can take to help contribute to delivery of more sustainable projects that better align with climate-related objectives.