



Canadian Network of Asset Managers
APPLIED CLIMATE ACTION COHORT

WORKSHOP NO. 2



2022

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SESSION 2: INTERGRATING CLIMATE CHANGE AND LEVELS OF SERVICE

MODULE A: Introduction and Tone-setting

IN THIS MODULE, FACILITATORS WILL:

- . Share back the common themes from participant check-ins
- . Identify commonalities and differences in challenges, approaches, and levels of maturity in asset management and climate change
- . Set the stage for participants to engage in this workshop in the way that suits their team and context best

USING THIS WORKBOOK



LEARNING GOAL

Specific learning outcome to be achieved.



ACTIVITY

Individual or group exercises that provide practical learning opportunities.



GLOSSARY

Definitions of words and phrases used throughout the course.



RESOURCES

Additional helpful materials related to the topic.



Key Themes from Check-ins

REFLECTION

What surprised you about the key themes shared? Which community/communities would you like to connect with after this workshop? Why?



Getting the most out of the Cohort Experience

As shared by facilitators, there is a wide range of participant challenges, context, and maturity in asset management, climate change, and integration. It is up to your team to engage with the content, activities and check-in support to get the most out of your experience.

Think of these cohort workshop like workout classes – facilitators will:

- . Prepare a program in advance based on feedback provided by participants on what they want to work on
- . Provide you a program of suggested “exercises”, “reps”, and modifications for you to participate to your best ability
- . Group you with others that are of similar context and/or ability, to learn from your commonalities
- . Group you with others that are of different context and/or ability, to learn from your differences
- . Provide you with time and space to complete the “exercise” program, while being available for guidance or questions

Getting the most out of this workshop means being realistic with your team about your current state and readiness for next steps. Just like in a workout class, it is up to you to choose to engage with the content to the level that aligns with your current abilities and realistic outcomes.

To get the most out of this workshop, you can:

- . Actively engage in the activities and discussions with your team
- . Ask questions of others (participants and facilitators)
- . Offer your experience to others that ask it



Figure: Levels of Effort

ACTIVITY

Last workshop, you were tasked with completing three evaluations:

1. Asset Management Readiness Scale
2. Climate Adaptation Maturity Scale
3. GHG Emissions Reduction Maturity Scale

Now that you've spent some time understanding your current state as an organization, we'd like you to think about your current abilities as a team that is coming together to make progress on integrating asset management and climate change.



What level of effort, intensity, and time do you think is realistic for your team in making progress in your goals over the next 6-9 months?

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SESSION 2: INTEGRATING CLIMATE CHANGE AND LEVELS OF SERVICE

MODULE B: Adaptive Approach to Complex Problems

LEARNING GOALS

After completing this module, you will be able to:

1. Acknowledge the complexity of advancing in asset management and climate change integration
2. Identify basic frameworks for complexity and connect their relevance to asset management and climate change integration

USING THIS WORKBOOK



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Uncertainties in Asset Management and Climate Change

Implementing asset management comes with a whole host of uncertainties:

- . Continually shifting risk consequences and likelihoods
- . Emergence of new services and changes to existing services
- . Changes in service demands or usage
- . Elected leadership turnover and community priorities
- . Rising costs of service delivery

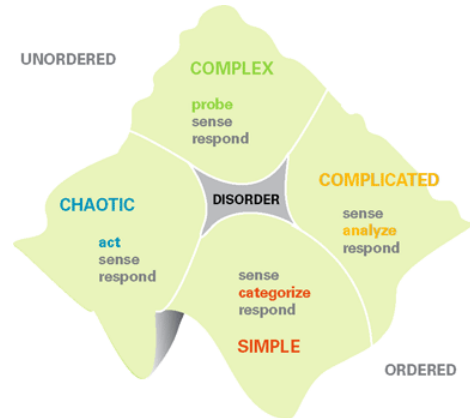
Many of these uncertainties are known to exist and the implications of these uncertainties are hard to predict with any amount of accuracy. To make things more complex, climate change also comes with its own set of uncertainties:

- . The future of greenhouse gas emissions reductions or increases
- . The impacts of changing climate on additional or amplified risks
- . Variables and assumptions in modeling of projected climate changes
- and many more!

Put asset management and climate change together, and you get an even larger set of combined and augmented uncertainties!

Identifying Complex Problems

The Cynefin (ke-niv-en) Framework suggests that there are four contexts of problems:



<https://hbr.org/2007/11/a-leaders-framework-for-decision-making>

Simple Contexts: The Domain of Best Practice¹

Problems in this context are generally well-understood, with clear application of approaches that have a track record of results. Solutions are linear and have a clear line of sight.

Complicated Contexts: The Domain of Experts¹

Complicated contexts, unlike simple ones, may contain multiple right answers, and though there is a clear relationship between cause and effect, not everyone can see it.¹ Addressing problems in this context often require engaging an expert.

Complex Contexts: The Domain of Emergence¹

In complex contexts, there are often multiple right answers. A linear path forward is not apparent, and the steps taken to move through the problem are only apparent in retrospect. The way to move through complex contexts is through trial and error – by taking small steps, evaluating the outcomes and new information learned, and taking a next step as informed by the previous. Some patterns exist and are made understandable through this trial and error approach.

Chaotic Contexts: The Domain of Rapid Response¹

Chaotic contexts are often referred to as “crises” or “unprecedented”. These contexts are constantly shifting with no perceptible patterns. This context can provide opportunity for rapid innovation.

¹A Leader’s Framework for Decision Making by David J. Snowden and Mary E Boone, <https://hbr.org/2007/11/a-leaders-framework-for-decision-making>

The Complexity of Asset Management and Climate Change

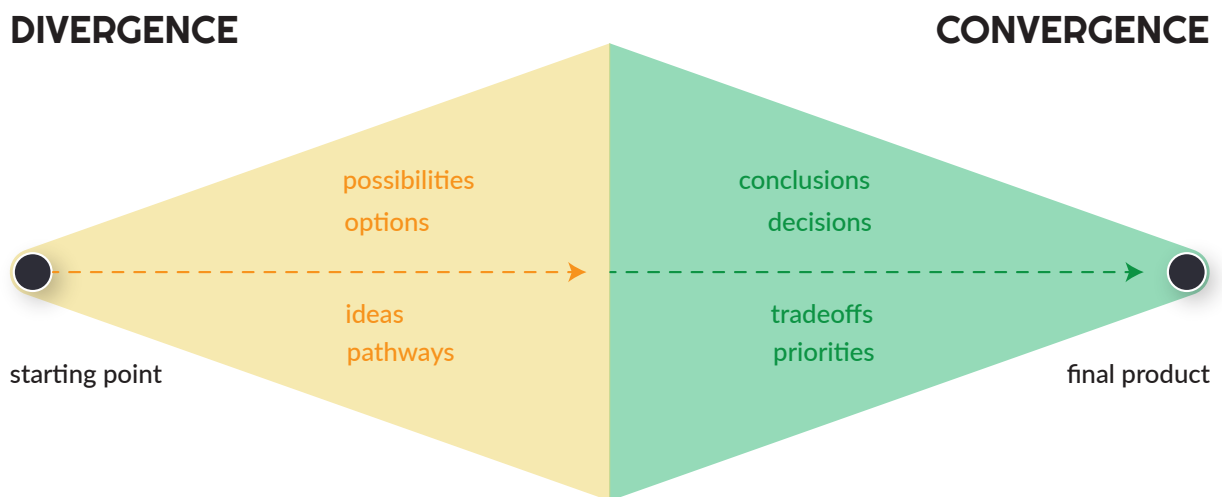
The integration of asset management and climate change falls squarely in the Complex Context realm. While there are some templates, case studies, frameworks and guides available to you to advance in asset management and/or climate change, these tools are often most helpful for tackling specific parts of the problem and won't be the answer on their own.

AN ADAPTIVE APPROACH TO COMPLEXITY

An adaptive approach is another way to think about the trial and error approach. It involves:

1. Acknowledging that the problem is complex
2. Identifying and exploring all the things you could do to address the problem
3. Making decisions between all the options to determine what you will do
4. Implementing the option
5. Evaluating the outcomes and new information learned through implementation, identifying any other information required
6. Going back to Step 1 with additional information and a new outlook on the complex problem

The irony of an adaptive approach presented in a linear way is not lost on us! This can also be explained visually:



Original illustration posted in Building a Second Brain, Creativity, Flow, Workflow on May 16, 2022 by Tiago Forte

Team Resilience Through Complexity

Adaptive approaches to complex problems take energy and resolve. They can also be challenging to explain to others that are not involved in the approach to the problem but are interested in the outcomes. An adaptive approach involves taking risks at a variety of scales without guaranteed outcomes, which is a very challenging thing to do in an organization.

There will always be a “**Messy Middle**” in an adaptive approach – where the next steps are not clear, and the team has experienced what can feel like setbacks. Reframing your relationship to these setbacks can be helpful – they’re not setbacks, they’re opportunities to review the results of your last experiment to help you determine the next best step to take.

THE MESSY MIDDLE



The Asset Management Mindset

Approaching asset management as a mindset, rather than a linear problem can be helpful:

ASSET MANAGEMENT AS A PROJECT

- . Defined start and end
- . Outcomes are certain
- . Singular, with connection to other projects

ASSET MANAGEMENT AS A MINDSET

- . Ongoing process
- . Outcomes are information that help to better understand context
- . Is integral in ongoing organizational decision-making



SESSION 2: INTEGRATING CLIMATE CHANGE AND LEVELS OF SERVICE

MODULE C: Level of Service and Climate Change

LEARNING GOALS

After completing this module, you will be able to:

1. Communicate the benefits of integrating climate change and level of service
2. Identify challenges of integrating climate change and level of service in your context and identify strategies to mitigate challenge

USING THIS WORKBOOK



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Why integrate Level of Service and Climate Change?

Reasons for integrating climate considerations into level of service

1. **Climate change impacts levels of service.**

- . Increasing risks and costs of delivering current levels of service – e.g., fires, drought, extreme rainfall, and invasive species can all impact watersheds, affecting source water quality and quantity.
- . Changing the levels of service that need to be provided – e.g., increasing demands on public beaches or green spaces during heat waves, or increasing design flows for stormwater conveyance systems.
- . Changing the types of services communities need – e.g., introducing a need for cooling centers or clean air shelters, or a new need for flood protection adjacent to waterways now more susceptible to flooding.

2. **Decisions about levels of services will impact climate change.**

Impacts decisions about what infrastructure we build and what we don't build and how infrastructure is maintained – which impacts community GHG emissions.

3. **Making decisions about level of service is a process that supports managing the uncertainties of a changing climate.**

A part of what makes integrating climate change into decision-making difficult is managing uncertainty. Making decisions about Levels of service support the continuous improvement that's needed to understand and communicate future costs and risks.



“Climate change may be a global problem, but it is often municipalities facing the biggest impacts of extreme weather events.

The ways in which a community is vulnerable depend on factors such as the services provided, local industry, population, historical planning decisions, community health, area, and geographic location.

These changes to our climate impact major community-owned and operated assets (both built infrastructure and natural assets), and often affect the conditions within which these assets operate in ways that were not anticipated when design occurred.

As a result, we need to understand the impacts and limitations of our assets, which could result in a change in how we deliver services to the community.

Municipalities provide a wide variety of services that support the people, the future, and the environmental health of communities. By assessing and managing risk, as well as levels of service, through a climate change lens, communities become more resilient.”

**FCM GUIDE FOR INTEGRATING CLIMATE CHANGE
CONSIDERATIONS INTO MUNICIPAL ASSET MANAGEMENT**

Level of Service 101

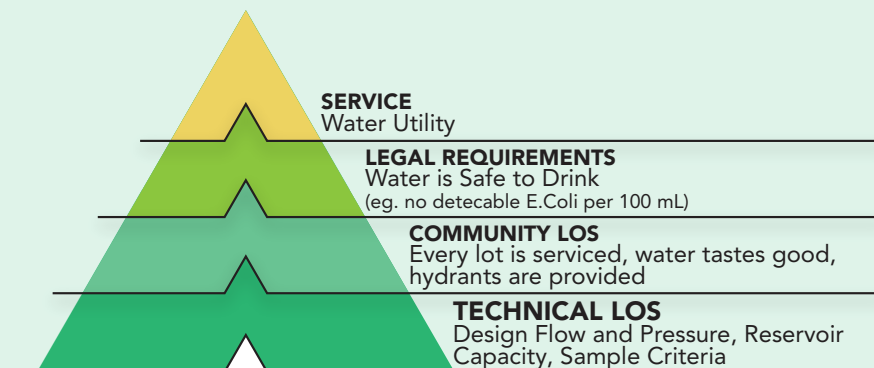
WHAT ARE LEVELS OF SERVICE?

Levels of service are specific parameters that describe the extent and quality of services that the municipality provides to users. This dictates the need for infrastructure, resources (e.g., staff time, funding, or materials), and ultimately the costs of providing the services.

Factors that influence levels of service include local conditions, priorities of decision makers, regulations set by provincial, territorial and federal governments, and customer expectations. Levels of service can generally be described in the following ways:

- . **Regulatory** – Does the service comply with applicable laws?
- . **Capacity/Availability** – Is there adequate capacity to meet the needs of users?
- . **Safety** – Is the system safe for workers and the public?
- . **Quality** – Does the service meet quality standards? How good is it?
- . **Reliability** – Is the service reliable? How often is it interrupted?
- . **Sustainability** – How does the service provide for quality of life, leadership, resource use, natural environment, and resiliency?

The pyramid below illustrates the layers associated with levels of service. The municipality can track and measure the delivery of a service based on legal requirements, community expectations and needs, and operational requirements. If the municipality is not meeting a commitment, it may have to be reconsidered or more funding may be reallocated to hit this commitment. Community expectations are an important factor when assessing levels of service, costs and risks over the lifecycle of assets.



FCM Guide for Integrating Climate Change Considerations into Municipal Asset Management

COMMUNITY VS. TECHNICAL LEVEL OF SERVICE

Climate change impacts Levels of service by changing the levels and types of services that need to be provided, as well as the risks and costs associated to these Levels of service. In other words, climate change sets a new bar for what to expect and consider when developing Levels of service. This is why it's important to come back to the fundamentals when thinking about Levels of service and climate change: What infrastructure exists to support service delivery? What level of service does your community value? And what are they willing to pay for? And how might this all change with climate change?

Infrastructure is only as valuable as the service it provides to the community.

Rather than jumping straight to pipe breakage rates or pavement quality index, it's important to start with defining the service in terms that community members and businesses understand – what can the community expect from their services in terms of water service outages, parks, or driving comfort? What are the community's expectations for Greenhouse Gas emissions reductions? This helps to ensure the priorities for limited resources are aligned with what the community values.

Benefits of understanding service:

- . Staff can seek efficiencies with clear performance targets established.
- . Members of the community know what to expect and what they are paying for.
- . You need to be clear about what the community is asking for before you can figure out if you can afford it.
- . Staff and council can communicate clearly and consistently with the public about what service levels will be provided and why and make aligned decisions.
- . Knowing where you're at and where you need to be makes it easy to find gaps and correct them.
- . Projects can be prioritized based on their impact to providing or sustaining service.
- . Actions such as cutting costs and making investments can be evaluated in terms of their impacts on services.
- . The consequence of risks can be evaluated in terms of their impacts on services .

Community levels of service provide clarity about expectations for **service outcomes** in plain language that everyone can understand. Technical levels of service measure **actions and inputs** that result in the outcomes. Technical levels of service are the levers that staff can adjust to optimize use of resources and deliver desired service outcomes.



NORTHERN CLIMATES, EXAMPLE OF COMMUNITY LEVEL OF SERVICE

Many local governments and First Nations spend a lot of time thinking about snow. How much snowfall must there be on a road before a truck or plow is sent out to clear it?

That number varies widely between communities, depending on their context. Communities that receive a lot of snowfall in a year have probably adapted to this reality – perhaps more people are equipped with trucks or large SUVs with ample clearance and winter tires, so plows do not need to be out when there is less than 2 inches on the ground. In communities that receive less snow, people may not have vehicles that are equipped for winter conditions. With less snow less often, that Local Government or First Nation may decide that they need to send the plows out when there is only half an inch of snow to provide safe travel in the community. The right level of service depends on the context of the community.

Climate change adds a dimension to sustainable levels of service – in the example of snowfall, will climate change cause more or less snow to fall in your community? Will you continue to maintain your current Levels of service? How will you adjust how you deliver services to maintain, increase, or decrease your level of service?

WHAT ARE IMPACTS OF CLIMATE CHANGE ON LEVELS OF SERVICE

Climate change introduces need for new or changed levels of service

A new or changed level of service may need to be provided to deal with the impacts of climate change. For example, your community may need to provide new services like cooling stations, increase green space provision to address urban heat island and reduce flood risks, or introduce Greenhouse Gas (GHG) reduction targets as levels of service. Changes to levels of service will change the costs of providing these services, which is a key consideration in decisions about how you will fund those services.

Climate change changes the context for delivering target levels of service

Climate change increases frequency of extreme weather events and changes the operating conditions for assets. These changes can impact the tasks and costs required to deliver target levels of service. For instance, you may see changes in precipitation patterns, which requires increased infrastructure capacity to deliver the same levels of service. For service areas where levels of service are set by regulations, organizations will need to anticipate and plan for changes in infrastructure, operations, maintenance, and programs required to deliver levels of service in a climate change context. Anticipated climate change impacts may also change your risk tolerance, which may affect how you and your team approaches asset management and makes trade-off decisions.



The International Institute for Sustainable Development produces a report on Advancing the Climate Resilience of Canadian Infrastructure. The review includes a range of climate hazards and impacts that present risks for Canadian infrastructure, such as:

- . **Land transportation infrastructure:** Softening and rutting of roads due to more frequent heatwaves and a shorter winter ice road season due to warming.
- . **Buildings:** Threats to the integrity of building foundations as seasonal temperature increases degrade permafrost, leading to subsidence and buckling.
- . **Water supply infrastructure:** Reduced sources of potable water due to greater frequency of drought.
- . **Wastewater and stormwater infrastructure:** Overwhelmed drainage and stormwater infrastructure as changing precipitation patterns increase the intensity of heavy downpours and flooding.
- . **Marine infrastructure:** Damage to ports and coastal infrastructure as sea levels rise and storm surges increase erosion.
- . **Energy and information and communications technology (ICT) infrastructure:** More frequent power outages as winter storms and high winds compromise utility lines and potential overheating of data centres due to increased temperatures and heatwaves.



DISCUSS: Consider the examples of climate hazards and impacts on infrastructure assets listed above. What infrastructure impacts are relevant to the services you provide in your community? What level of service does your community value with respect to those services?

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CHALLENGES IN DEFINING LEVELS OF SERVICE



POLL – What are the challenges you’re encountering in your organization when it comes to defining levels of service?

- Getting out of the weeds and focusing on what matters
- Using LOS in decision-making
- Data overwhelm
- Managing uncertainty
- Other: _____

DISCUSS: What are the challenges you’re encountering in your organization? What are ideas and approaches for managing these challenges?



SESSION 2: INTEGRATING CLIMATE CHANGE AND LEVELS OF SERVICE

MODULE D: How to integrate Climate Change and Levels of Service - The Approach

LEARNING GOALS

After completing this module, you will be able to:

1. Move forward with integrating climate change and level of service in the context of your community.

USING THIS WORKBOOK



LEARNING GOAL

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Starting with community levels of service

It is normal for different service areas within an organization to be in different stages of maturity with defining and using levels of service in decision-making. However, in order to support effective integration of climate considerations into asset management processes, all service areas need to have a baseline understanding of community levels of service and the implications of climate change.

Integrating climate change and levels of service begins with understanding the impacts of climate change on community levels of service. What impacts of climate change on our services do we anticipate? Which new services might we need to plan for? Where might we need higher or lower levels of service to reflect climate change mitigation and adaptation?

- . Making clear connections between climate change and community levels of service helps to:
- . Minimize jargon and establish common language between staff of various backgrounds, disciplines, and departments
- . Apply a consistent approach to understanding climate impacts to services across the organization
- . Communicate impacts and risks clearly with Council and the public
- . Consider priorities based on service outcomes rather than inputs or tasks
- . Get started even when more detailed technical levels of service have not yet been defined

Once the connections between community levels of service and climate change have been established, service area specialists can determine the changes in technical levels of service required to deliver desired community levels of service. This will provide further information about costs of achieving target levels of service and may lead to reconsidering community level of service targets.

THE PROCESS

The following process outlines the basic steps of integrating climate change into level of service considerations. This process begins with basic steps of defining levels of service, as many organizations have not yet defined their levels of service. This is a process of continuous improvement.

Actions to get started in the process are identified below.

The success of this process depends on including the right people at the right time. Before beginning the process, work with your AM team to determine who should be involved at the stages of the process that you're working through.

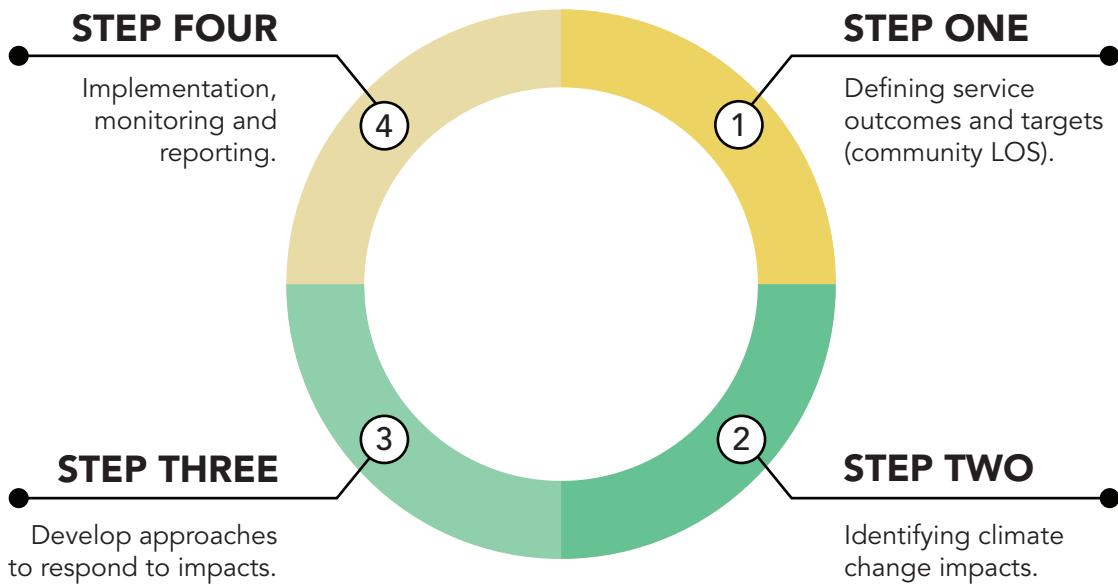


Figure: Steps of Integrating Climate Change



	QUESTIONS TO ANSWER	ACTIONS TO GET STARTED
STEP 0. Identifying participants	Who needs to be involved in each step of this process?	<ul style="list-style-type: none"> Work with your AM team to determine which steps of this process you aim to work through next, and who needs to be involved.
STEP 1. Defining service outcomes and targets (community LOS).	<p>What are our services?</p> <p>What expectations does the community have for these services?</p> <p>What are our regulatory requirements?</p> <p>What is our current performance compared to expectations and regulatory requirements?</p> <p>What commitments can we make? (LOS targets)</p> <p>Focus on matters most for your community.</p>	<ul style="list-style-type: none"> Define service areas (e.g. water, parks). Consider starting with one or two service areas to learn about the process before tackling all of them. Write down statements that capture the expectations that the community has for the services. E.g. water is safe to drink, I have access to a green space not far from where I live. Write down regulatory requirements. Connect these to the expectation statements where possible. For each expectation statement, identify if your current service delivery is generally below, meeting, or exceeding community expectations and how you know (i.e. what is informing your understanding of current performance?) For each service expectation statement, identify what service level commitment your organization can make (e.g. set LOS targets).
STEP 2. Identifying climate change impacts.	<p>What is the impact of climate change on our services? (NOT ASSETS)</p> <p>What new LOS will we need to deliver?</p> <p>How will our LOS performance change if we continue with the status quo?</p> <p>Ensure impacts to natural assets are considered here.</p>	<ul style="list-style-type: none"> Identify a source of information for climate projections. If local projections have not been developed, begin with a source like climateatlas.ca or climatedata.ca. Review climate projections to understand how temperature patterns and precipitation patterns are expected to change. Summarize these changes by season (e.g. hotter, drier summers). Review each service area and service commitment (LOS target) by season. For each season, identify how projected changes will impact services. What new services will be required? Where will the expectation or commitment for service levels change? Where will service levels likely decrease if nothing different is done?

	QUESTIONS TO ANSWER	ACTIONS TO GET STARTED
STEP 3. Develop approaches to respond to impacts.	<p>What will we do to manage climate impacts?</p> <p>What will we do to deliver new LOS?</p> <p>When will we do it?</p> <p>How will we fund it?</p> <p>Do we need to refine our commitments (LOS targets)?</p> <p>Ensure natural assets are considered here.</p>	<ul style="list-style-type: none"> . Using the results of Step 2, identify options for managing impacts and delivering new service levels. Identify when actions must take place (i.e. near term, medium term, longer term, don't know) and approximate costs. . Evaluate the options by considering costs and benefits. . Review selected options compared to LOS commitments to identify if any LOS commitments may need to be revised based on what it will take to meet commitments (e.g., are commitments affordable? Can they be influenced by your organization?).
STEP 4. Implementation, monitoring and reporting.	<p>What approaches have we implemented?</p> <p>How does our LOS performance compare to our targets?</p> <p>What have we learned?</p> <p>Who needs this information?</p>	<p><i>Note: In working through Step 3, you may end up with more questions than answers. If this is the case, focus on identifying what information you need before you can decide to move forward, and how you will get this information. Then, create a plan for implementing actions to get the required information.</i></p> <ul style="list-style-type: none"> . Together with the team that identified the impacts and developed the actions, review which actions you've implemented, impacts to your LOS performance or future risk, and learnings. . Identify reporting audiences and key information. Reporting on LOS and climate impacts may be integrated into other reporting processes.



INCREASING LEVELS OF MATURITY

The table above identifies actions to take to move through the process for the first time. As your organization progresses through levels of maturity with developing asset management processes and integrating climate change into those processes, you will continue to move through the cycle – answering the same questions but with increasing levels of data and detail where appropriate to inform decision-making. The figure below identifies qualities of later stages of maturity in defining levels of service and integrating climate change.

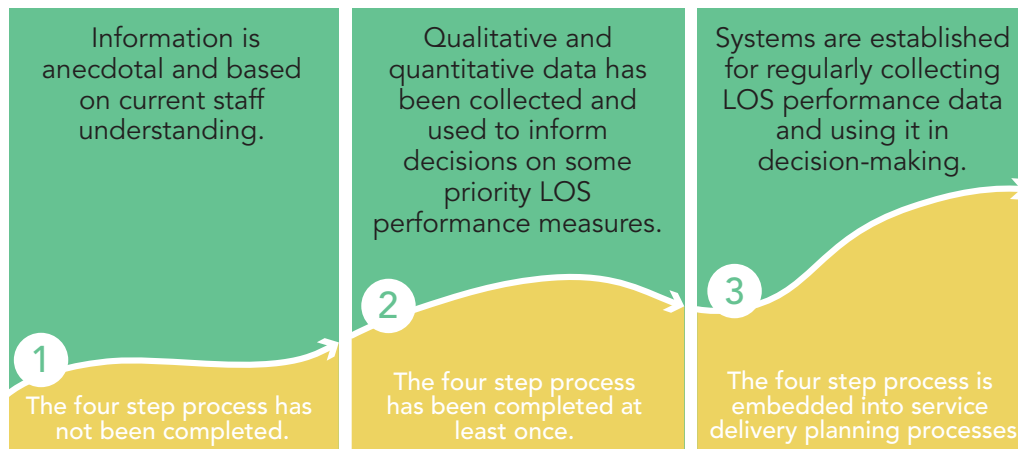


Figure: Increasing levels of maturity in the process of integrating climate considerations into LOS



Guide for Integrating Climate Change Considerations into Municipal Asset Management, FCM.

<https://fcm.ca/sites/default/files/documents/programs/mamp/guide-for-integrating-climate-change-considerations-into-municipal-am.pdf>

Asset Management Levels Of Service Guide, Northwest Territories Association of Communities.

<https://www.assetmanagementbc.ca/wp-content/uploads/Levels-of-Service-Guide-NWT.pdf>

The Building Blocks of Asset Management: A how-to guide for reaching Level 1 of FCM's Asset Management Readiness Scale (Municipal Asset Management Program)

<https://fcm.ca/en/resources/mamp/guide-getting-started-asset-management-in-your-municipality>

Weathering the Storm: Asset Management and Climate Change

<https://rmlberta.com/wp-content/uploads/2018/07/2018-05-24workbook-climate-press-bleeds.pdf>



SESSION 2: INTEGRATING CLIMATE CHANGE AND LEVELS OF SERVICE

MODULE E: How to Integrate Climate Change and Levels of Service - Application

LEARNING GOALS

After completing this module, you will be able to:

1. Start working on integrating climate change and Levels of Service while learning from facilitators and other participants.

USING THIS WORKBOOK



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Applying the approach

Using the remaining time in the session and the process for integrating climate change into level of service considerations (outlined in **Module D**), you will have the opportunity to work on assessing where you are at in the process, where you want to go, and how you will get there.

WHERE ARE YOU?

DISCUSS: Where you are at in the process of integrating climate change into level of service considerations? Consider drawing from your Asset Management Readiness Scale (AMRS) assessment that you completed in **Session 1**.



Some guiding questions to help you along the way:



What is going well in integrating climate change considerations in levels of service? Why do you think it's going well?

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What's challenging about integration climate change considerations in levels of service? What makes this challenging?



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WHERE DO YOU WANT TO GO?



DISCUSS: Identify your next milestone for what you would you like to accomplish in the process of integrating climate change into levels of service.



Some guiding questions to help you along the way:

What will it feel like when you've achieved this milestone?



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What will be different? What will be the same?



Who needs to know/is affected by the journey to get to the milestone?
Who isn't affected?





HOW DO YOU GET THERE?



Is this simple, complicated, or a complex problem?

What kind of approach is best suited to this problem?

Why do you think this approach will be effective for reaching your next milestone?



Identify preliminary strategies for achieving your next milestones.



Instead of focusing on all identifying all the steps necessary to get to your goal, what is the first thing you could do? How could your team come together after this first step to evaluate what you learned?





How can the other cohort participants and/or facilitators help you to take action on these first steps?



A large, empty rectangular box with rounded corners and a thin green border, intended for participants to write their responses to the question above.



DISCUSS: Share your discoveries in working through these questions with your breakout group. What observations did you make about working together on this type of problem? What approach did you decide on taking? Share how the approach will help you accomplish your next milestone?

A large, empty rectangular box with rounded corners, intended for participants to write their discussion notes.

