

Integrating Climate Change into Asset Management: Lessons from Communities in B.C.'s Kootenay Region

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by

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Introduction

Rural local governments are increasingly concerned with preparing their communities for climate impacts such as heat, drought, flooding, and wildfire. Long-term resilience of core services, with overall strategy for sustainable service delivery under changing conditions over time is critical for securing the resilience of communities. Amidst demographic and land-use, climate change is an additional driver of change that must be factored into asset management processes. The Rural Development Institute’s Climate Change and Asset Management Support Program, a part of the Rural Climate Adaptation Capacity Building Project, is undertaking a preliminary scoping exercise to better understand how local governments in the Columbia Basin are incorporating climate change into their asset management processes and what gaps need to be filled to ensure sustainable assets and services over time.

Five participating local governments were consulted to determine where and how regional climate projections were being applied to service areas such as service areas relating to water, drainage, wildfire, etc. The City of Cranbrook, City of Golden, Village of Slocan, Regional District of Kootenay Boundary, and Regional District of Central Kootenay were asked to identify at which stage of asset and climate integration they were at, using the Federation of Canadian Municipalities (FCM) 12-Step Integrated Climate Change into Asset Management Framework (see Figure 1). Each local government was at a different stage of asset management, and, within local governments, different service areas were at different stages of integrating climate projections. In most cases, water supply was the most developed service area, with sophisticated asset management planning that incorporated climate impacts on water supply, and in certain cases, preliminary or next step opportunities for sustainable service delivery.

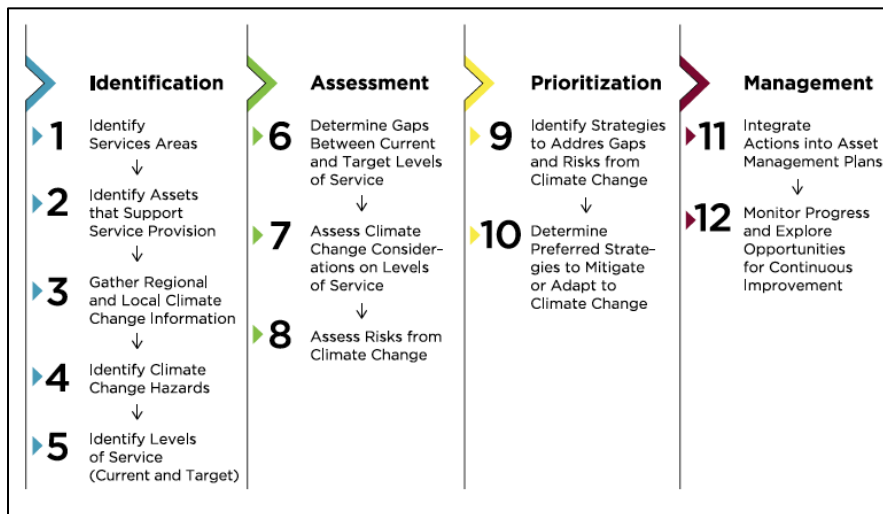


Figure 1: FCM's four phase, 12-step framework provides a general process for integrating climate change projections and data into local government asset management planning.

The goals of this report are to:

- Identify the local government’s progress and needs on using climate change projections to inform their asset management planning decisions.
- Determine to what extent climate risk and low carbon opportunities are being integrated into levels of service (LOS) analysis, priority setting, and sustainable service delivery.
- Generate common ‘next steps’ to support local governments in including climate change in their asset management planning process.

In addition, natural assets and nature-based solutions have been identified as an asset management priority among most participating local governments. To better understand the state of natural asset

assessment and ways to operationalize it in planning, we identified where local governments were on the Municipal Natural Asset Initiative’s 6-step framework (Figure 2).

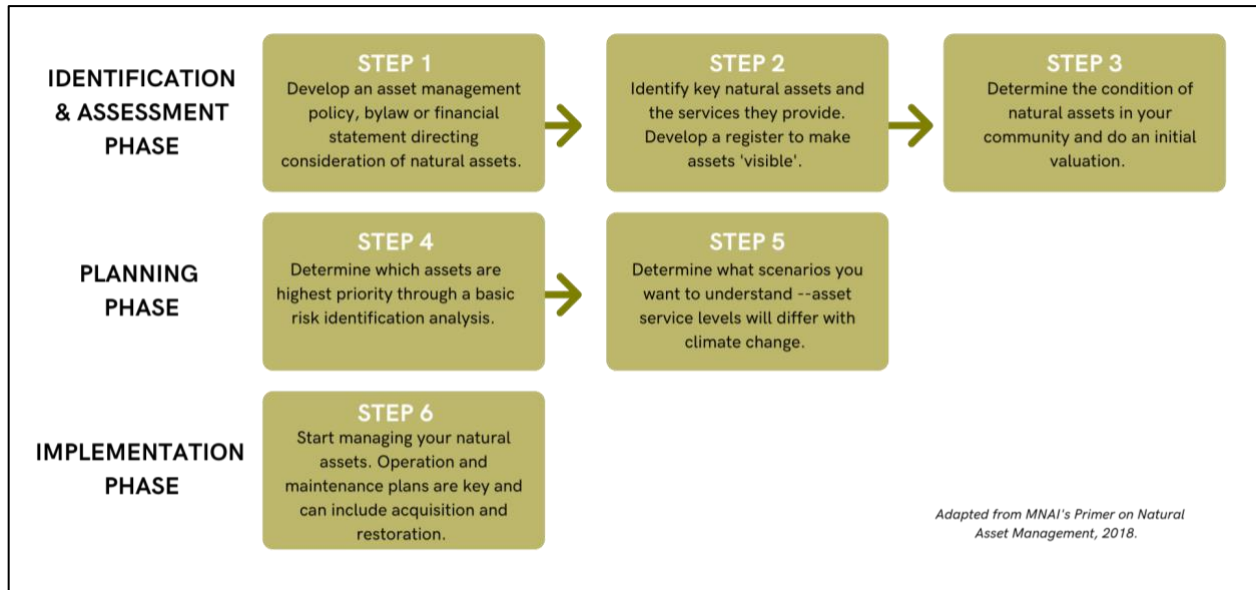


Figure 2: The Municipal Natural Asset Initiative’s 6-step framework from their Primer on Natural Asset Management provides a general process for natural asset management planning (MNAI 2018).

Three common themes emerged from the consultation. These themes relate to:

- 1) The lack of consistency and comprehensiveness of asset management planning within and across local governments.
- 2) The need to operationalize natural assets in existing asset management planning.
- 3) The need to apply and embed regional climate projections in all asset management planning and investment decisions.

These themes were viewed as necessary for streamlining decision-making, prioritizing budgets and investments, and advancing sustainable asset management and service delivery with a climate forward lens.

City of Cranbrook

Identified FCM Step: Step 9-10 for Built Assets, Step 2 for Natural Assets.

Participants:

Mike Matejka, Manager of Infrastructure,
Katelyn Pocha, Water/Waste Water Project Manager

Opportunities:

- Undertake a comprehensive asset and service review and include climate change data.
- Identify and develop LOS for natural assets (including recreation-type assets).
- Increase communication with decision-makers and senior management via the city-wide Asset Management Steering Committee to communicate the necessity of embedding climate change in asset management and the benefits and value provided by natural assets.

The City of Cranbrook has an asset management policy in place for managing select engineered assets¹ and is currently working on developing an asset management strategy. Asset management is championed by the city's Public Works lead, but is not standardized throughout the organization, rather, it is pursued independently at different departmental levels with varying levels of sophistication. Water quality and supply assets for instance, have an established LOS and assessed risk and consequences of failure, positioning these assets at a Step 9 or 10 in the Prioritization Phase of FCM's guide. For natural assets however, the city is still in the Identification Phase. Currently they are working on developing a natural asset inventory and would like to develop risk identification and LOS for their natural assets. Cranbrook has recently committed to the renewal of their city-wide Asset Management Steering Committee, which they hope will lead to greater understanding of the complexity of asset management, including levels of risk and finance, but also the influence of climate change on service provision over time. The goal is to enhance cross-departmental collaboration and coherence.

A key opportunity identified by the participants is to increase staff literacy about climate change in asset management planning. Ideally this will be done by leading staff through an asset service review that includes climate change considerations and data so that relevant staff develop a more robust understanding of the impacts of climate change on specific assets and core services. Like other local governments, Cranbrook has ongoing multi-million-dollar investments which require the inclusion of best available climate projections to gain a better understanding of life cycle of the project, consideration of long-term service provision, and overall return on investment. Working with land use planners and the community was identified as necessary to develop a coherent framework for asset management that considers resilient, low carbon opportunities in land use planning decisions (e.g., to curb sprawl and related service provision, encourage natural asset protection, etc.) and other areas of community planning such as emergency management planning.

Communicating the costs of climate action vs. inaction is another key opportunity in Cranbrook. For instance, communicating the free services provided by natural assets, and the costs of losing these assets and services due to zoning or mismanagement would be helpful. This would help support the development of Cranbrook's natural asset inventory, including recreational assets, as part of LOS analysis.

City of Golden

Identified FCM Step: Step 5/6 for Built Assets, Step 2 for Natural Assets

Participants:

Chris Cochran, Manager of Operations/DCAO

Phil Armstrong, Manager of Development Services/Planner

Opportunities:

- Access and integrate up-to-date climate data and projected climate impacts across all service areas, particularly for upcoming infrastructure renewals.
- Identify targeted LOS and compare with current LOS to determine gaps.

¹ MNAI. (2021). Towards Natural Asset Management in Kootenays British Columbia: A Summary of inventory results and recommendations. Retrieved from: <http://www.cbrdi.ca/sites/default/files/Documents/PDF/Climate%20Adaptation/MNAI-Kootenay-Cluster-report-104.pdf>

The City of Golden has self-identified as Step 5/6 on FCM's 12 Step Guide for built assets, placing themselves on the tail end of the Identification Phase and moving into the Assessment Phase. Golden has an asset management policy in place, has completed condition assessment studies for roads, water, sewer, and utility, and has asset management plans for core infrastructure, which includes recommendations for the next 10-20 years, but does not include climate projections. They have initiated a preliminary natural asset inventory, and this data needs to be expanded and incorporated into their overall asset management planning process.

Golden has recently revised their Intensity Duration Frequency (IDF) curves, including rainfall projections under climate scenarios, to be used in their Stormwater Management Plan Update. These IDF curves are being disseminated to the development community, in subdivision requirements for example, so that developers, planners, and engineers can consider how new development and key service needs might be impacted under changing climate conditions. Facilities is also applying energy and emissions standards in a second iteration of condition assessment and reporting. In the future, the participants see an opportunity to expand the wildfire development permit areas (DPA) and, possibly an opportunity to develop a climate DPA. Moving forward, Golden would like access to up-to-date climate data to use for all upcoming infrastructure renewals.

There is an important distinction between the services that local governments are currently providing and the objective or target levels they are working towards providing.² Currently, Golden has not compared their current LOS to their target LOS, presenting an opportunity to embed climate projections into future LOS targets across all service areas. The participants would like targeted advice around climate change and LOS to develop a more holistic framework for thinking about sustainable service delivery that includes climate changes over time. The city will be working with Urban Systems in Fall 2021 to set a direction for their asset management program and to determine what gaps need to be filled.

Village of Silverton

Identified FCM Step: Step 9/10 for Built Assets, Step 2 for Natural Assets

Participants:

Hillary Elliot, Chief Administrative Officer
Andre Van den Berg, LandInfo Tech

Opportunities:

- Complete a clickable condition assessment for all built assets that includes climate projections, for the village's QGIS platform.
- Map existing climate data, risk information, and natural asset information into their open-source QGIS platform.

Village of Silverton participants estimate they are in the Prioritization Phase or Step 9/10 of the FCM spectrum for their built assets. The village is currently working on Phase Three of their Asset Management Plan: Climate Adaptation Initiatives and sees this prioritization phase as a pivotal opportunity to include a low carbon resilience lens, or climate risk, emissions, and co-benefits considerations, into their asset

² Federation of Canadian Municipalities. (2018). Guide for Integrating Climate Change Considerations into Municipal Asset Management. Retrieved from: <https://fcm.ca/sites/default/files/documents/programs/mcip/guide-for-integrating-climate-change-considerations-into-municipal-am.pdf>

management planning process. For instance, the village's current drinking water pipe runs over Silverton Creek. The condition is poor and under climate projections, this is a high-risk asset due to increased frequency and magnitude of flooding, including debris flow and/or ice jams, and the fact that the community's drinking water could be disrupted. Spending the extra money now to lay the pipe underground could be a strategic investment for the village over the long term and enhance their adaptive capacity.

A fundamental part of this work has been conducted alongside consulting firm, LandInfo Tech, who have been working with the village to perform on their built asset management planning, while also building considerations for climate risk, emissions, and natural assets into their open-source QGIS platform. The QGIS platform can be updated remotely and does not require an in-house specialist. This process has allowed the village to approach asset management from a data, e.g., condition assessment, rather than policy perspective, and helps support decision-making to Council.

At this stage, the participants hope to develop a clickable condition assessment that will visually detail the state of their assets along with other relevant information, such as construction year, and combine this with climate risk data to better understand how asset vulnerabilities may advance over time and to prioritize decisions about upgrades, renewals, and/or future investments. The village is also interested in exploring in more detail how to embed natural asset information into their QGIS platform and has performed an initial exploratory natural asset inventory (Step 2).

Regional Districts

Regional districts face special challenges in asset management planning compared to other local governments. The distinct differences in service areas, assets, and service provision over expansive, rural areas and in their decision-making and financing models contribute to very specific challenges for Regional Districts. Some of these challenges relate to service provision:

- 1) Regional districts are required to match costs and benefits of services to people who benefit from services, essentially, residents pay for what they get³ and don't get what they don't want to pay for. This has implications when it comes to decisions about upgrading and/or investing in assets.
- 2) Service areas and services provided are determined by a regional board and electors, which can lead to not only a broad scope, but variation in services to manage across significant geography.
- 3) Regional districts are an arm of the provincial government, and their jurisdiction is limited. For instance, Crown Lands are provincially and/or privately managed, yet relied heavily upon by the municipalities and electoral areas within a regional district, yet the regional districts can only recommend, not regulate, management strategies for crown land.

In regional districts water systems provide water treatment, supply, and distribution to specific municipalities and electoral areas. The systems will be unique across different regional districts in terms of how many active connections they provide service to. The largest expenditures for regional districts include protective services and environmental services, such as water provision and recreation.³

³ Regional District of North Okanagan. What is a regional district? Retrieved from: <http://www.rdno.ca/index.php/about/regional-district>

Regional District of Central Kootenay

Identified FCM Step: Combinations of Assessment & Prioritization Phases for Built Assets, Step 2 for Natural Assets.

Participants:

Tanji Zumpano, Water Services Liaison
Paul Falkner, Senior Energy Specialist
Mark Crowe, Parks Planner
AJ Evenson, Senior Project Manager
Matthew Friesen, Financial Analyst

Opportunities:

- Advance built and natural asset inventories and condition assessments with a climate forward lens and include already collected climate data where available.
- Develop a cohesive set of regional policies and procedures for asset management that include climate projections to guide work across different electoral areas.
- Develop GIS mapping for assets for ease of use by staff across the regional district.

The Regional District of Central Kootenay (RDCK) recognizes the importance of formalizing asset management planning for the region¹ and advancing this work with a climate forward lens. RDCK does not yet have a cohesive asset management policy, and currently, asset management planning varies widely across service areas. Parks, for instance, has completed an asset inventory, while water systems have developed asset management plans (AMP) for all 19-20 water systems in the district. These AMPs are updated annually and include an asset inventory, estimated service life, and risk and criticality assessments. According to the participants, the inclusion of climate data and incorporation of natural assets are significant for protecting supply and must be included in forthcoming AMP updates and LOS assessments. Due to the advanced work done on water systems, participants mapped RDCK at a Step 9 in the Prioritization Phase and identified water systems as the benchmark for all other asset management planning. Though other service areas and asset inventories were identified as Step 2 on FCM's guide, there was a feeling that there is an opportunity to embed climate data more systemically into condition assessments to provide sustainable service delivery over time.

RDCK participants noted the importance of coordinating with general managers of different service areas and developing a unified set of asset management policies and procedures to guide work happening across the regional district. This cohesive approach will help embed regional climate data into all service areas and asset management plans and guide service prioritization opportunities. Coordination with general managers and those in operations will be critical to advance asset management with a climate forward lens. It also has the potential to expand opportunities for acquiring regional climate data and for the joint procurement of services for asset management planning, bringing the best value for municipalities throughout the region. This type of cohesive asset management is best supported with region-wide GIS tools that can be accessed by staff across the district.

Regional District of Kootenay Boundary

Identified FCM Step: Phase 2-3 for Built Assets, Step 2 for Natural Assets

Participant:

Goran Denkovski, Manager of Infrastructure and Sustainability

Opportunities:

- Obtain detailed adaptation data for the whole regional district and information on services unique to each municipality and electoral area to determine how services will be impacted by climate change.
- Adopt a common lens to advance holistic asset management planning across the region.

The Regional District of Kootenay Boundary (RDKB) participant identified the district in Phase 2/3, the Identification Phase on FCM's guide. The RDKB does not currently have an asset management plan or policy in place but has completed an asset inventory and are in the process of developing asset management plans for their five water systems. The RDKB worked with FCM's Municipal Asset Management Program (MAMP) to develop their asset inventory and develop a preliminary state of infrastructure report. This data is in review to be included in the regional district's asset management plan. The RDKB has also worked with MNAI to develop a baseline natural asset inventory. The participant is now looking for support integrating climate projections, risks and the services provided by natural assets into current reporting, forthcoming levels of service assessments, and accounting structures.

The RDKB has various valuable data sets, for instance a Climate Adaptation Report for Area A and Natural Hazards Mapping for Areas A, B, and D, but would like detailed adaptation data for the entire regional district to manage and track assets and services unique to each municipality and electoral area. This information will provide insights into how different regions and service areas will be impacted by climate change.

To overcome capacity constraints and reduce siloes, the participant suggests a regional approach to asset management using a common climate lens. Currently, each water system in the RDKB has an individual manager, leading to siloed management and financial decision-making done without a consistent and systemic understanding of the state of assets throughout the region. Alternatively, adopting a connected, system-wide approach could streamline management and decision-making processes and foster collaborative opportunities to develop aligned regional policies. This approach would be especially beneficial when managing natural assets, for instance, which are regional in scale but difficult to govern due to jurisdictional challenges (e.g., watershed DPAs or sensitive areas assessment).

The RDKB is currently working with Fortis BC and hope to align their work with them, and the data collected for asset management to advance the development of an integrated climate action plan in the near future.

Workshop Overview

Based on the needs assessment of the five participating local governments, two workshops will be conducted. The workshops will be led by service providers who have been working in and are familiar with asset management and climate change projections in the Columbia Basin. These are:

Workshop 1: Integration of Climate Change into Comprehensive Asset Management Planning and Levels of Service Reviews (1.5 hours)

Confirmed Consultants: Sara Anderson, Urban Systems and Mel Reasoner, Climatic Resources Consulting

Rationale: Communities have identified the need to learn how to undertake comprehensive asset management and service reviews to better understand asset condition, with the inclusion of climate risks, and the influence on levels of service (LOS) (current/target) over time. Understanding climate impacts to service areas, and the risks to assets and services is necessary to secure existing assets, to identify opportunities for resilient, low carbon solutions (e.g., natural assets), and to prioritize approaches that ensure sustainable service delivery over time. This type of comprehensive approach minimizes the gaps identified in current departmental approaches where systems managers make the case for infrastructure renewal and budget in isolation. A more comprehensive cross-departmental approach will help to build in systemic analyses about key vulnerabilities and risks across all service areas and to effectively prioritize decisions and direct funding.

In this workshop local governments will better understand the influence of climate change on their service areas and assets, how climate will influence current and future service delivery, and identify key next steps to streamline climate data into asset management, and best approaches and tools that can be applied to climate-proof your local government assets and services.

Workshop 2: Integration of Natural Asset Inventories and Plans in Asset Management Planning (1.5 hours)

Confirmed consultants: Roy Brooke, MNAI; Andre van den Berg, LandInfo Tech; and Alison Shaw, FlipSide Sustainability.

Rationale: This workshop emerged from the conversation with local governments about the integration of climate change into asset management. Identifying natural assets and their services was viewed as a critical piece of asset management planning, particularly as a low carbon resilience approach under changing climate conditions. Four of the five participating local governments have done previous work with MNAI, identifying natural assets and their services for specific service areas, e.g., flood management, water supply, etc. One of the five local governments has been working with LandInfo Tech to embed natural assets into their existing asset management planning process. In this workshop local governments will be guided on next steps for operationalizing natural asset approaches in asset management planning in the face of climate change.

The goal of the workshops is to orient Basin governments toward next steps and most strategic opportunities to embed climate change in asset management planning.

Concluding Remarks & Next Steps

Asset management is occurring in departmental siloes in local governments, leading to systems and service areas at different stages of management. In general, water assets and systems were the most advanced areas for asset management planning, with many including climate risks to identify climate impacts on the resource, the assets, and the influence on levels of service over time.

Amidst each unique local government asset management planning process, three common needs were identified across the five local governments which will form the basis of two workshops hosted by local service providers:

1. Asset management is currently organized on a departmental basis with very little oversight as to a more comprehensive understanding of existing assets, condition assessments, and levels of service assessments. It is therefore not uncommon for one service area like water systems and/or drainage to be more advanced than other service areas. For instance, a local government may be on Step 10 for their water systems, but only at Step Two for evaluating their transportation infrastructure. There is a need for more comprehensive asset management to streamline climate projections into all asset management decisions, to prioritize renewal and investment decisions, and guide decision making at all levels of government and across regions.
2. Specific natural asset inventories have been done in several communities, mostly focused on stormwater and drainage services, yet more work is needed to embed natural assets into asset accounting and management structures and showcase the benefits and cost-savings of natural assets. Natural assets, in general, are viewed as a critical piece of the management calculus moving forward.
3. Climate projections need to be more systemically applied to asset management planning, particularly in levels of service assessments, to secure core services under changing conditions and to identify future needs and low carbon opportunities to ensure sustainable service delivery into the future.

This report briefly describes the state of asset management in each participating local government and summarizes identified gaps and potential needs and priority next steps moving forward.

The three themes will make up the two workshops providing an opportunity for local governments to ask service providers necessary questions about moving forward. It will also provide an opportunity for peer learning and exchange among local governments in the hopes of sharing steps for accelerating the implementation of climate change into asset management planning across the Columbia Basin.

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