Time to act

A forward-looking approach to municipal infrastructure and climate change action

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From the heat dome that impacted the west coast this summer to the devastating wildfires that have gripped much of the country to the flooding and thunderstorms across different provinces, the impacts of extreme climate events have been stark. That is the backdrop for Canadians as the country participates in the United Nations Climate Change Conference (COP26) this month. While world leaders come together in Glasgow with goals to reach global net-zero by 2050 and to "keep 1.5 degrees within reach," municipal leaders are on the front lines of the climate crisis.

The impacts associated with climate change are complex and contribute to a changing municipal risk landscape. Municipal leaders need new strategies to manage the risks associated with climate change while continuing to deliver high-quality services to residents. Fortunately, there are impressive examples of municipalities that are leading change and addressing interrelated financial, environmental, and community sustainability issues.

By embracing an integrated, forward-looking approach, municipal leaders can tackle these system-level challenges head on and build thriving, resilient communities.

Challenges to Municipalities

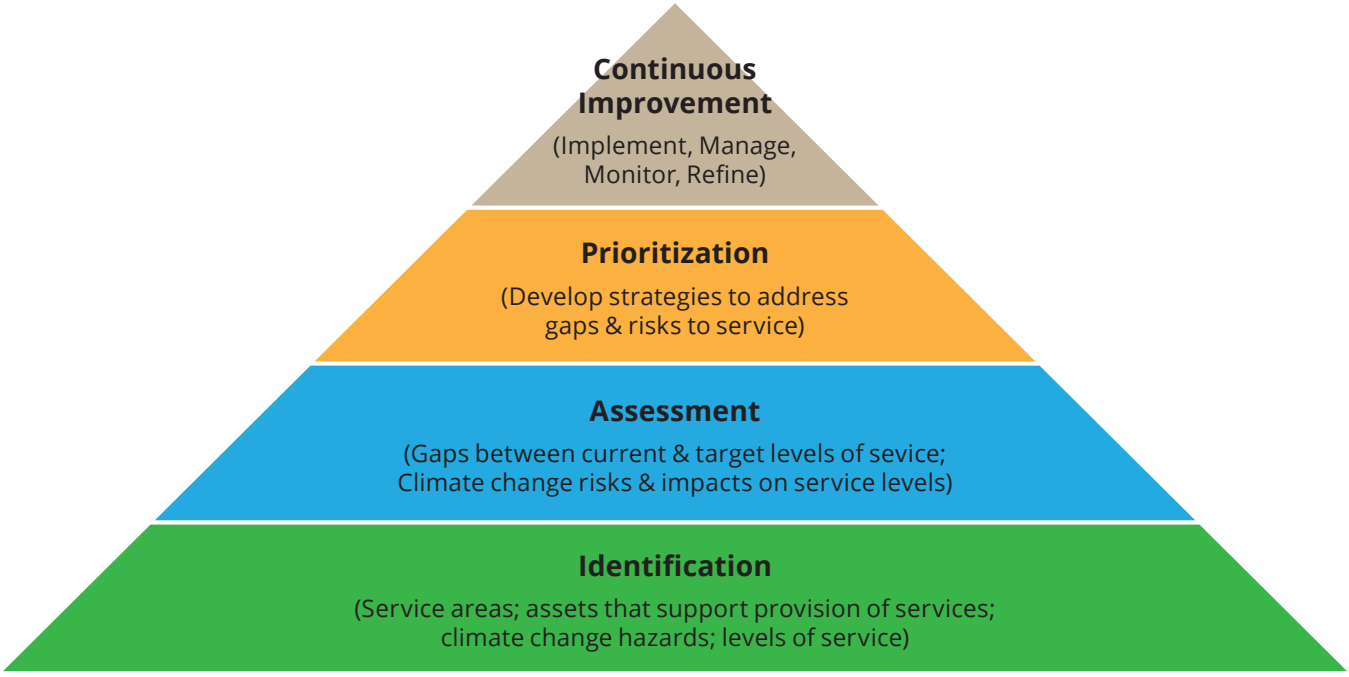
One of the key takeaways from the Intergovernmental Panel on Climate Change's Sixth Assessment Report is that without significant reductions in greenhouse gas (GHG) emissions, the world cannot win the "war" against climate change. The UN Secretary General describes the climate crisis as "approaching a point of no return" in the absence of immediate and dramatic action.

The reduction of harmful GHG emissions is often described as the mitigation challenge. But as the increased frequency of extreme weather events shows, dealing with impacts associated with a changing climate is no longer a future risk but a present threat to municipalities' capacity to deliver services.

Making municipalities more resilient to the impacts of climate change can be characterized as the adaptation challenge. Both challenges are particularly acute in Canada. As "Canada's Changing Climate Report"[1] notes, the country is warming twice as fast as the rest of the world.

1 Government of Canada (2019), "Canada's Changing Climate Report," Environment and Climate Change Canada, https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/Climate-change/pdf/CCCR_FULLREPORT-EN-FINAL.pdf.

Figure 1
Integrating climate change and asset management planning



A robust and comprehensive response to climate change: Climate change and asset management planning follow complementary processes where integration capitalizes on the interconnections between identification, assessment, and prioritization of issues as well as interventions or investments.

The climate emergency has changed the risk landscape for municipalities. It has accelerated the pace of climate response expected by taxpayers and broadened the way that infrastructure-related services are expected to influence outcomes associated with community resilience and social, health, and equity impacts.

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As Sherena Hussain of Schulich School of Business points out, the COVID-19 pandemic has challenged the public sector and revealed gaps in municipalities' resilience.[2] This strained resilience is partly due to the need to reallocate scarce resources but also arises from how interconnected many complex challenges are, including the impact of climate risks on municipal infrastructure.

For society to address a range of challenges effectively, infrastructure asset management is increasingly part of conversations around driving a green recovery and more inclusive society. Hussain describes this moment as an opportunity for an "infrastructure reset" across the public sector, a theme that resonates with FCM's recommendations for the federal post-COVID economic recovery as outlined in its "Building Back Together Better" report.[3]

While over 500 Canadian municipalities have declared a climate emergency,[4] few have defined what that commitment will entail in terms of changes to service levels or how different climate hazards will impact enterprise-wide risks. Even fewer have costed the scope of this commitment. There is a gap between the aspiration to meet climate change challenges and the preparedness of municipalities to do so.

The challenges facing municipalities around the speed and scope of their climate responses are also complicated by the dozens of infrastructure-related services they offer. Each of these services and their associated asset classes present unique life cycle needs and risk management priorities that are influenced by different climate hazards.

Fortunately, there are replicable examples across Canada about how to meet these complex challenges effectively. Four approaches that embody the "infrastructure reset" and lay the foundation for a new municipal climate action model include:

- demonstrating climate leadership and governance;
- integrating climate change and asset management planning;
- reframing existing structures and approaches; and
- incorporating "green infrastructure" as part of the asset management process.

2 Sherena Hussain (February 22, 2021), *Resetting Infrastructure Asset Management* [Conference presentation], AMONTario 2021 Climate Change & Asset Management Conference, https://youtu.be/g8Ukiv1vHIQ.

3 Federation of Canadian Municipalities (November 2020), "Building back better together: Municipal recommendations for Canada's post-COVID recovery," https://data.fcm.ca/documents/COVID-19/fcm-building-back-better-together.pdf.

4 Random Acts of Green, "506 Municipalities have Declared a Climate Emergency in Canada," April 3, 2019, https://raog.ca/2019/04/03/457-canadian-municipalities-have-declared-a-climate-emergency/.

Demonstrating Climate Leadership and Governance

Effective leadership and governance are foundational for climate change action. Any municipality must incorporate or "mainstream" climate action across its operations and services to address climate change impacts successfully. This process entails guiding the organization in the alignment of its policies, data, financial practices, procedures, technology, and human resources to ensure that municipal services are maintained in spite of a changing climate. Without a depth and intensity of leadership, meaningful and sustained climate change actions are likely to fail.

The City of Selkirk, a regional hub in Manitoba with a population of just over 10,000, is notable for its vision and commitment to addressing climate change impacts on municipal services. City council and the administration are aligned in terms of a vision for a healthy, sustainable community. Selkirk's council passed a strategic plan that makes environmental stewardship and the sustainability of operations a priority. The city's Climate Change Adaptation Strategy, which it developed collaboratively with the University of Winnipeg's Prairie Climate Centre, helped establish a shared understanding about how climate change would impact Selkirk's municipal service delivery.

After understanding how the local climate was projected to change over the next decade, the city scoped potential impacts, assessed risks and opportunities, and identified adaptation actions. The Climate Change Adaptation Strategy assisted the municipality in its tactical development of various approaches customized to eight service lines, including transit, sewer utility, parks, and government services. The city's CAO Duane Nicol recognizes that "We're spending millions of dollars every year on infrastructure, and so we better be making the right long-term investments. Without that long-term climate vision, you may have to prematurely replace or repair assets. If we are not considering whether that infrastructure can operate successfully within the climate it will experience over its full life cycle, then we're being negligent as stewards of the community. It's not just the financial risk of having to prematurely replace or repair assets, we're talking about risk to human life and property."

Selkirk's Climate Change Adaptation Strategy has influenced infrastructure decisions like:

- separating storm and septic sewers to handle flooding better;
- decreasing reliability on the electricity grid through installation of solar panels at the arena and geothermal at the water treatment plant;
- expanding streets to hold more snow in the winter; and
- auditing the city's inventory of trees with a plan to plant more for increased shade and capacity to hold water.

These are manageable, positive actions which ensure that risks to the delivery of Selkirk's current and future services will be minimized.

Integrating Climate Change and Asset Management Planning

Wise municipalities are integrating their climate change and asset management functions to implement robust and comprehensive responses to the impacts of climate change. This approach recognizes that climate change and asset management planning follow complementary processes. Integration capitalizes on the interconnections between the identification, assessment, and prioritization of climate change and asset management issues as well as the interventions or investments (see Figure 1).

At the Town of Halton Hills, the roles of climate change and asset management planning have been combined at the senior managerial level. This facilitates, from a governance perspective, a single process for integrating climate change in the development of service levels and risk management frameworks across the town's services and asset classes. It avoids duplication of resources across departments and has enabled the mid-sized Ontario municipality to be more nimble in addressing issues that have corporate impact.

As both the Selkirk and Halton Hills examples illustrate, the integration of climate change within a municipality's asset management framework is important for allowing climate adaptation and mitigation measures to be operationalized effectively. Traditionally, the management of physical assets within municipalities has been siloed. This has led to individual staff (or departments) becoming proficient at managing assets as opposed to the organization being effective, holistically, in addressing system-level issues.

The approach of integrating climate change and asset management enables a municipality to address enterprise-wide issues more cost effectively while connecting service delivery expectations and risks in an integrated way.

Reframing Existing Structures and Approaches

Many municipalities are innovating the way they approach problems by considering the holistic outcomes they aim to achieve and then reassessing or reframing the way functions have conventionally been approached within the organization.

For example, the City of Mississauga has leveraged the procurement function to reduce its net environmental impact and become more sustainable.

The city's approach is innovative in that it realizes greater value from the collaboration of procurement professionals with other departments when compared with conventional approaches. At many municipalities, the procurement function is primarily engaged after investment decisions have been made and budgets have been approved. In these circumstances, the procurement function is mainly transactional.

In Mississauga, by contrast, the sustainability procurement coordinator educates other departments about a life cycle approach to asset acquisitions from a sustainability perspective. This involves helping departments redefine best value for their assets – from considering modularity, reuse potential, reparability, and related issues. This approach encourages staff to consider not only the financial costs of investments, but also their net environmental impact on a life cycle basis. It also engages asset stewards in incorporating environmental impact considerations at a much earlier stage in the planning process, which drives better outcomes.

The city has also been updating its procurement and disposal of assets policies, refining these to balance fiscal responsibility and environmental stewardship. As Andrea Westfall, the city's sustainability procurement coordinator,

notes, "Sustainable procurement is an incredibly valuable tool. I can't think of another mechanism that allows us to manage risk, save money, meet the challenges of climate change, engage and retain staff, remove barriers for diverse suppliers, and work toward Reconciliation with our Indigenous communities, along with procuring the goods and services we need."

Incorporating "Green Infrastructure" as Part of the Asset Management Process

Another key tactic to addressing complex challenges starts with broadening municipal perspectives on what "infrastructure" entails and how services can be delivered. Green infrastructure can play a significant role in helping municipalities build climate resilience by cost-effectively providing a variety of services that support climate change adaptation and mitigation, as well as a variety of other economic, environmental, health, and social benefits.

"Green infrastructure" encompasses natural assets, such as:

- wetlands and parks;
- enhanced assets like bioswales or naturalized stormwater ponds; and
- engineered assets, such as permeable pavement or infiltration trenches.

Forward-looking municipalities have been increasingly strategic about preserving and managing existing green infrastructure, including integrating these assets into their asset management planning process. There are leading examples across the country, but Saskatoon's approach is particularly comprehensive and integrated.

In 2020, the City of Saskatoon launched an ambitious Green Infrastructure Strategy to "enhance the urban environment and improve quality of life" by integrating green infrastructure into land use planning and asset management. An implementation plan for the strategy, currently under development, proposes five programs proposed for implementation over the next decade. These programs include:

- protecting, restoring, and managing natural areas across the city;
- increasing green infrastructure in urban areas;
- enhancing community engagement;
- promoting local, sustainable, and equitable food in the city; and
- connecting Saskatoon's "Green Network," which covers almost one-quarter of the city's territory, between natural and urban areas.

The vision informing this strategy is to create an interconnected green network that provides sustainable habitat for people and nature. Actions could include enhancing green spaces, trees, and parks as well as improving social equity in terms of access to green spaces and sustainable, locally grown food.

While Saskatoon is early in the process of incorporating green infrastructure into their asset management plans, they have created a solid foundation by starting with a comprehensive strategy that positions green infrastructure as essential and considers its value across a range of municipal services. They have also started to develop an ecosystem based, system-level approach to asset management, including processes to inventory their green infrastructure assets.

Looking Ahead

Canadian municipalities are leaders in integrating green infrastructure with asset management. In addition to Saskatoon, Ontario municipalities such as the Regional Municipality of York and City of London are recognized leaders in integrating forestry assets into their asset management plans, while other municipalities, such as the City of Thunder Bay, have successfully implemented Low Impact Development (LID) strategies to manage stormwater issues.

Infrastructure decisions have consequences for decades to come. Assets that are built today must be able to adapt to changing climate conditions and should also be planned with climate change mitigation in mind. Although these challenges are formidable, they present tremendous opportunities to build more resilient and equitable communities that are sustainable financially and environmentally over the long term.

By embracing a systems-level perspective, municipal leaders can play a key role in improving the world we want to leave behind for future generations and start laying the groundwork for that future today. MW

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