

The Next Evolution of Asset Management

From Local Data to Infrastructure Intelligence

Canadian Infrastructure Council
Conseil canadien des infrastructures

Table of Contents

Executive Summary 3

The Evolution of Asset Management Planning in Canada 5

Asset Management Planning is Becoming More Widely Adopted, but Maturity Remains Uneven 10

From Asset Management Data to Infrastructure Intelligence 14

A Practical Agenda for Infrastructure Intelligence 21

1. Establish a common language for infrastructure data 21

2. Increase investment in long-term asset management capacity 23

3. Expand models for shared technical services 24

4. Make asset management more forward-looking 25

Conclusion 25

Endnotes 26

Executive Summary

Canada's infrastructure decisions are becoming more complex. Governments must renew or upgrade aging infrastructure while supporting population growth, enabling housing, strengthening climate resilience, and adapting to climate change, and making the best use of limited public resources. Meeting these challenges requires more than additional investment. It requires better information to make better choices about what to maintain, optimize, renew or rebuild; where existing infrastructure can support housing and growth; and where investments can have the greatest impact.

Canada's first National Infrastructure Assessment concluded that solving the country's infrastructure challenges is not simply a matter of building more. It requires making better use of existing infrastructure while planning strategically for future needs. It also identified fragmented planning, inconsistent infrastructure data, and limited visibility into asset condition as barriers to effective decision-making.

> Asset management planning provides an important foundation for better infrastructure decisions.

Over the past decade, its adoption has grown across Canada, helping communities understand their assets, condition, lifecycle costs, and long-term investment needs. But adoption and maturity remain uneven, particularly in smaller communities, and asset management plans are not always maintained or used to guide infrastructure decisions. Differences in how infrastructure data is defined and collected also make information harder to compare and use. Asset management must also evolve to better account for climate risks and natural infrastructure.

Drawing on the Council's research and engagement with academics, governments, and practitioners from across Canada, the paper identifies an opportunity to **turn local asset management data into broader infrastructure intelligence:** information that can be readily shared and used by decision-makers to understand infrastructure needs, risks, performance, capacity, and investment priorities across jurisdictions. This does not require a single asset management system. It requires greater interoperability (i.e., the ability to make data more comparable and easier to share and use across different systems), and capacity supports, so that locally generated information can support decisions by Indigenous governments and communities, as well as between local, regional, provincial, territorial, and federal governments.

Executive Summary

The paper proposes the following **practical actions** to strengthen both asset management practice and infrastructure data production and deployment for better infrastructure outcomes:

1. 

Establish a common language for infrastructure data by collaboratively developing and agreeing on minimum common data fields, definitions, and reporting conventions.

2. 

Increase investment in long-term asset management capacity, particularly for communities with limited technical and organizational resources.

3. 

Expand models for shared technical services so smaller communities can access specialized expertise in asset management, engineering, data, finance, and climate risk.

4. 

Make asset management more forward-looking by better integrating climate risks, natural infrastructure, and emerging data into planning.



The Evolution of Asset Management Planning in Canada

Understanding how Canada got here can help shape what comes next

Today, asset management in Canada is widely recognized as a cornerstone of sound infrastructure decision-making across Canada and at all orders of government. Strong asset management practices provide a clearer picture of infrastructure condition, performance, risks, and long-term costs, which can help communities and local governments plan investments over time, reduce unexpected costly service disruptions and emergency repairs, and better align infrastructure decisions with broader priorities, such as housing growth and climate resilience. Fundamentally, asset management can help decision-makers get more value from existing assets by identifying where maintenance or optimization can extend asset life or create capacity before new infrastructure is required. It can also help them understand the longer-term cost implications of today's choices, including where delaying maintenance could lead to higher costs in the future. This paper focuses primarily on how these practices have evolved at the community level, where much of Canada's public infrastructure is owned and managed.

There is no single international model for asset management. As the examples of New Zealand, England, and Australia below illustrate, countries have taken different approaches to local infrastructure asset management, ranging from national legislation and guidance to professional frameworks and subnational requirements, each reflecting their own governance structures and local contexts. Canada's asset management landscape has similarly evolved through a combination of international management frameworks, accounting standards, capacity building efforts, and policy requirements that together shape how communities plan, finance, maintain, and renew infrastructure assets.

A key driver of the evolution of asset management has been the adaptation of international frameworks – most notably the ISO 55000[1] series and the International Infrastructure Management Manual (IIMM)[2] – to Canadian municipal realities. These standards were not imposed through regulatory channels; rather, they were operationalized through practitioner networks (e.g., Canadian Network of Asset Managers, PEMAC Asset Management Association of Canada, and the Municipal Asset Management Program (MAMP) delivered by the Federation of Canadian Municipalities) that have provided accessible tools and guidance calibrated to local capacity.

Financial reporting requirements provided another important building block. The Public Sector Accounting Board's Standard 3150 (PSAB 3150)[3] required municipalities to recognize infrastructure assets, such as roads, bridges, water systems, and buildings, on their financial statements and estimate their value and useful life. Although developed for accounting purposes, the standard prompted many municipalities to establish asset inventories and improve infrastructure data collection, creating an important foundation for modern asset management planning.

Federal, provincial, and territorial governments have reinforced this evolution through funding requirements and policy incentives. The federal government's primary role has been to encourage asset management through long-term infrastructure funding agreements, most notably through the Build Communities Strong Fund (BCSF) Community stream (formerly known as the Canada Community-Building Fund and the federal Gas Tax Fund), which requires provinces and territories to support communities in developing and maintaining asset management plans as a condition of accessing predictable infrastructure funding.[4]

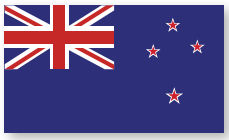
Provinces and territories across Canada have adopted a variety of approaches. Ontario introduced a legislated approach to asset management planning through O. Regulation 588/17, which came into effect in 2018 and has been phased in over time. Communities were first required to develop plans for core infrastructure assets, with requirements expanding in July 2024 to cover all municipal infrastructure assets. The regulation establishes a common reporting framework for asset inventories, condition, levels of service, lifecycle activities, and long-term financing needs, with the full requirements phased in by July 2025, while allowing municipalities flexibility in how information is assessed and reported.

Provinces, such as Alberta, Saskatchewan, and all four Atlantic provinces, encourage asset management primarily through incentive-based models, such as funding formulas, tiered progress frameworks, or targeted capacity-building programs, rather than mandated through legislation.[5,6] More broadly, asset management is embedded within broader frameworks for sustainable service delivery[7] or capital planning[8] in some jurisdictions. Depending on the program or agreement, communities may also be required to demonstrate progress as a condition of accessing infrastructure funds.

In the territories, asset management planning practices are more closely linked to capacity-building efforts and federal–provincial/territorial funding arrangements. Early initiatives, including the 2005 Gas Tax Fund agreements and the implementation of PSAB 3150 accounting standards in 2009, focused on establishing foundational asset inventories and financial reporting practices. More recent funding agreements under the BCSF Community Stream embed asset management requirements within core funding arrangements, linking access to capital investment with demonstrated planning maturity.[9]

What can Canada learn from international approaches?

New Zealand, England, and Australia have taken different approaches to strengthening local infrastructure planning and asset management.[10]



New Zealand has embedded long-term infrastructure planning in legislation. Local governments must prepare infrastructure strategies covering at least 30 years that consider asset renewal, changing demand, levels of service, resilience and the financial implications of future infrastructure needs. These strategies are intended to connect asset-level planning with broader financial and long-term planning.



In **England**, every local highway authority is expected to maintain asset management policies and strategies. National guidance sets common expectations around lifecycle planning, risk management, performance monitoring and continuous improvement, while local authorities develop approaches that reflect their own transport priorities. Some highway maintenance funding is also tied to demonstrating good asset management practices.



In **Australia**, the Institute of Public Works Engineering Australasia (IPWEA) provides tools and guidance aligned with international ISO 55000 standards to help councils develop asset management plans and connect them with long-term financial planning. States then set their own requirements. For example, Victoria requires councils to prepare Asset Plans covering at least 10 years, while allowing councils flexibility in their approach to asset management. In New South Wales, councils must plan for all assets under their control over at least 10 years, including service standards and the expected costs of maintenance, rehabilitation and replacement. These costs must be reflected in long-term financial plans.

These examples show that stronger asset management can take different forms, but they also share a common goal: **moving beyond simply having a plan, to using it to inform long-term infrastructure decisions.** For Canada, these examples offer different ways to think about how common expectations, long-term planning, and local flexibility can work together.

Building capacity remains central to improving asset management outcomes

Capacity-building initiatives have been equally important in improving asset management planning in Canada, particularly for smaller communities with limited technical and financial resources. Rather than prescribing a single approach, these initiatives have focused on equipping communities with the tools, guidance, and expertise, and supporting local capacity development, needed to build and sustain asset management practices.

Across Canada, the MAMP, delivered by the Federation of Canadian Municipalities with funding from the Government of Canada, provided asset management capacity-building support from 2017 to 2024.[11] Over its eight years, the program helped 2,773 communities across Canada through grants, training, technical support, and peer learning. The program supported communities of all sizes to improve data collection, lifecycle planning, financial decision-making, and long-term infrastructure sustainability. MAMP played an important role in advancing asset management adoption across Canada, particularly among smaller and rural communities with limited internal capacity, while also encouraging the integration of key elements – including climate resilience, service delivery, and evidence-based infrastructure investment – into municipal planning.

Many provinces have complemented these efforts with their own technical supports. In Quebec, for example, the Centre d'expertise et de recherche en infrastructures urbaines (CERIU) has been mandated and supported by the provincial government to develop practical asset management tools, including fillable asset management spreadsheets, model plans, and detailed implementation guides that help municipalities produce more consistent asset management plans while reducing the technical burden on local governments.[12] Though not prescriptive, this support provides the baseline foundation required to improve consistency and data translation across asset management plans.

Capacity-building initiatives have also increasingly supported the adoption of asset management planning in Indigenous and northern communities. These efforts aim to improve long-term infrastructure sustainability, support evidence-based investment decisions, and strengthen local governance capacity. However, as in many communities across Canada, significant gaps remain in infrastructure data quality, condition assessment practices, and the availability of consistent lifecycle information across communities. Indigenous and northern communities can face additional challenges, as conventional municipal asset management tools and reporting approaches may not fully reflect the operational realities, local and cultural priorities, or governance structures. Recognizing these distinct needs, tailored supports are emerging, including: Indigenous Services Canada's Asset Management Program; Indigenous-led initiatives, such as the Ontario First Nations Technical Services Corporation's Asset Management Program, which supports First Nations in developing asset management plans and strengthening infrastructure management practices[13]; and, the Standards Council of Canada, which has developed technical, climate risk-informed standards for asset management in northern regions.

As asset management planning continues to expand and mature across communities, it needs to evolve to better account for climate risks, such as flooding and permafrost thaw, and natural infrastructure, such as wetlands, forests, floodplains, and urban greenspaces.[14,15] While awareness of these considerations is growing, many communities continue to face challenges in identifying, measuring, and incorporating climate risks and natural assets into asset management plans, reflecting gaps in data, analytical capacity, and established practice.

Some good guidance on natural asset management comes from the Natural Assets Initiative, which promotes methodologies for identifying, valuing, and managing natural assets as part of municipal service delivery systems.[16] In addition, standards developed by organizations, such as the CSA Group, including guidance on climate adaptation, resilient infrastructure, and nature-based solutions, are helping communities incorporate natural infrastructure into risk management and long-term planning processes.[17]

Key Takeaways

Collectively, these approaches have **helped advance the adoption of asset management planning** across Canada and supported communities to develop asset inventories, assess condition, and manage lifecycle planning in a way that reflects local priorities and operational realities and strengthens local decision-making.

At the same time, however, this flexibility has led to the **creation of asset management systems, which vary considerably** in how information is defined, collected, assessed, and managed, making infrastructure information more difficult to compare and use across jurisdictions, and in some cases, has not levelled up to the quality of asset management planning needed.

Sustained, practical support remains essential as communities move from adopting asset management to strengthening how it is applied.



Asset Management Planning is Becoming More Widely Adopted, but Maturity Remains Uneven

Canada's investments in standards, policy and legislative requirements, funding, and capacity building have advanced asset management planning. Today, only about half of Canadian communities have formal asset management plans for most core infrastructure assets and adoption remains uneven across jurisdictions, asset classes, and community sizes. This variation reflects differences in policy approaches, municipal capacity, and local priorities, and has important implications for the quality and consistency of infrastructure data.[i]

Asset management adoption continues to grow

Reflecting the differing policy drivers described in the previous chapter, the prevalence of asset management planning varies across provinces and territories and among different asset classes. **Jurisdictions that have introduced legislative requirements or linked infrastructure funding to demonstrated asset management progress generally have higher rates of adoption.** Ontario, for example, reports near universal adoption of asset management plans for the core infrastructure asset classes covered by the earlier phases of its asset management regulation, while New Brunswick has also achieved high rates of adoption through funding requirements tied to municipal infrastructure programs.

In contrast, jurisdictions that rely primarily on voluntary guidance generally report lower adoption rates. This is particularly evident in smaller, remote, and northern communities, where limited capacity, staff turnover, and geographic isolation present persistent challenges to developing and maintaining comprehensive asset management plans. Table 1 illustrates these differences across Canada.

i This chapter uses data from Canada's Core Public Infrastructure (CCPI) survey to assess how adoption of asset management planning varies depending on the region or size of the community.

Table 1: Asset Management Planning Adoption by Province and Territory, 2022

Infrastructure Category	AB	BC	MB	NB	NL	NT	NS	NU	ON	PE	QC	SK	YT
Active Transportation	43%	28%	20%	78%	36%	14%	40%	0%	63%	21%	10%	45%	14%
Bridges and tunnels	64%	58%	60%	73%	38%	0%	31%	100%	99%	0%	25%	66%	50%
Culture, recreation and sports	60%	53%	53%	78%	55%	15%	55%	13%	82%	71%	30%	59%	50%
Potable water	71%	81%	54%	83%	58%	43%	69%	80%	98%	73%	58%	62%	60%
Public transit	34%	27%	25%	60%	0%	0%	33%		59%	75%	14%	36%	100%
Roads	76%	80%	59%	94%	61%	25%	59%	8%	99%	41%	54%	77%	60%
Solid waste	60%	41%	43%	78%	35%	22%	56%	43%	77%		34%	59%	75%
Stormwater	64%	73%	47%	86%	44%	0%	55%	0%	94%	21%	44%	57%	25%
Wastewater	71%	79%	53%	86%	58%	50%	69%	80%	98%	83%	55%	63%	50%

Source: Statistics Canada Table 34-10-0290-01 (Canada's Core Public Infrastructure (CCPI) 2022)

Policy differences do not tell the whole story; municipal size also plays an important role in explaining variation in the adoption of asset management planning in Canada. Larger municipalities are significantly more likely to have formal, documented asset management plans across all major infrastructure asset classes. This reflects greater organizational capacity, dedicated staffing, regulatory exposure, and larger infrastructure portfolios that justify more sophisticated asset management systems. Smaller municipalities continue to report lower adoption rates across most asset classes. While many have established foundational asset inventories, they often face greater challenges maintaining comprehensive asset management systems because of limited staffing, competing operational priorities, and constrained financial resources.

Table 2 demonstrates this relationship between municipal size and asset management adoption. It also helps put the jurisdictional differences in Table 1 into context: provincial and territorial averages reflect not only different policy approaches, but also differences in the size and capacity of the communities within each jurisdiction.

Table 2: Asset Management Plan (AMP) Adoption by Municipal Size and Asset Class, 2022

Infrastructure Category	Very Small	Small	Medium	Large	Very Large
Active Transportation assets	33%	37%	30%	54%	81%
Bridges and tunnels	54%	76%	71%	85%	100%
Culture, recreation and sports	48%	60%	64%	76%	93%
Potable water assets	62%	80%	83%	83%	100%
Public transit assets	24%	41%	48%	53%	70%
Roads	66%	83%	84%	93%	100%
Solid waste assets	54%	59%	52%	43%	85%
Stormwater assets	52%	73%	77%	79%	92%
Wastewater assets	62%	78%	81%	83%	100%

Source: Statistics Canada Table 34-10-0290-01 (CCPI 2022)
Note: Very Small (<5,000), Small (5,000–29,999), Medium (30,000–99,999), Large (100,000–499,999), Very Large (500,000+) as defined in CCPI survey. Calculations combine urban and rural municipalities.

Adoption does not equal maturity

The Council's engagement with provincial, territorial, and municipal governments reinforces the finding that asset management uptake is improving but remains uneven. **Across jurisdictions, there was widespread recognition of the value of asset management.** While the impact of funding constraints and political priorities on asset management planning were noted, **community capacity was consistently identified as the primary barrier to progress.** Smaller communities often lack the staff, technical expertise, and institutional capacity needed to maintain asset inventories, update plans, integrate asset information into financial planning, and sustain asset management as an ongoing business process. As a result, many communities rely on external consultants to develop and update asset management plans. While this can provide important expertise and help address immediate capacity needs, communities still need sufficient internal capacity to maintain asset management practices and use asset information in ongoing decision-making.

High staff turnover and reliance on external consultants were recurring challenges, particularly in rural, northern, and remote communities. Several jurisdictions also noted that dedicated staffing support is often more valuable than one-time planning grants because maintaining asset management systems requires continuous effort and technical expertise, rather than periodic updates.

Key Takeaways

Taken together, these findings suggest that Canada has largely succeeded in establishing asset management planning as a best practice. It has strengthened and extended asset management planning in many communities, and there is much more work to do. The challenge facing infrastructure decision-makers is no longer simply increasing the number of asset management plans. Instead, **attention is increasingly shifting toward improving the maturity of asset management plans, ensuring that they are maintained over time, integrated into day-to-day decision-making, and capable of generating high-quality infrastructure data** that can support decisions beyond the municipal level.



From Asset Management Data to Infrastructure Intelligence

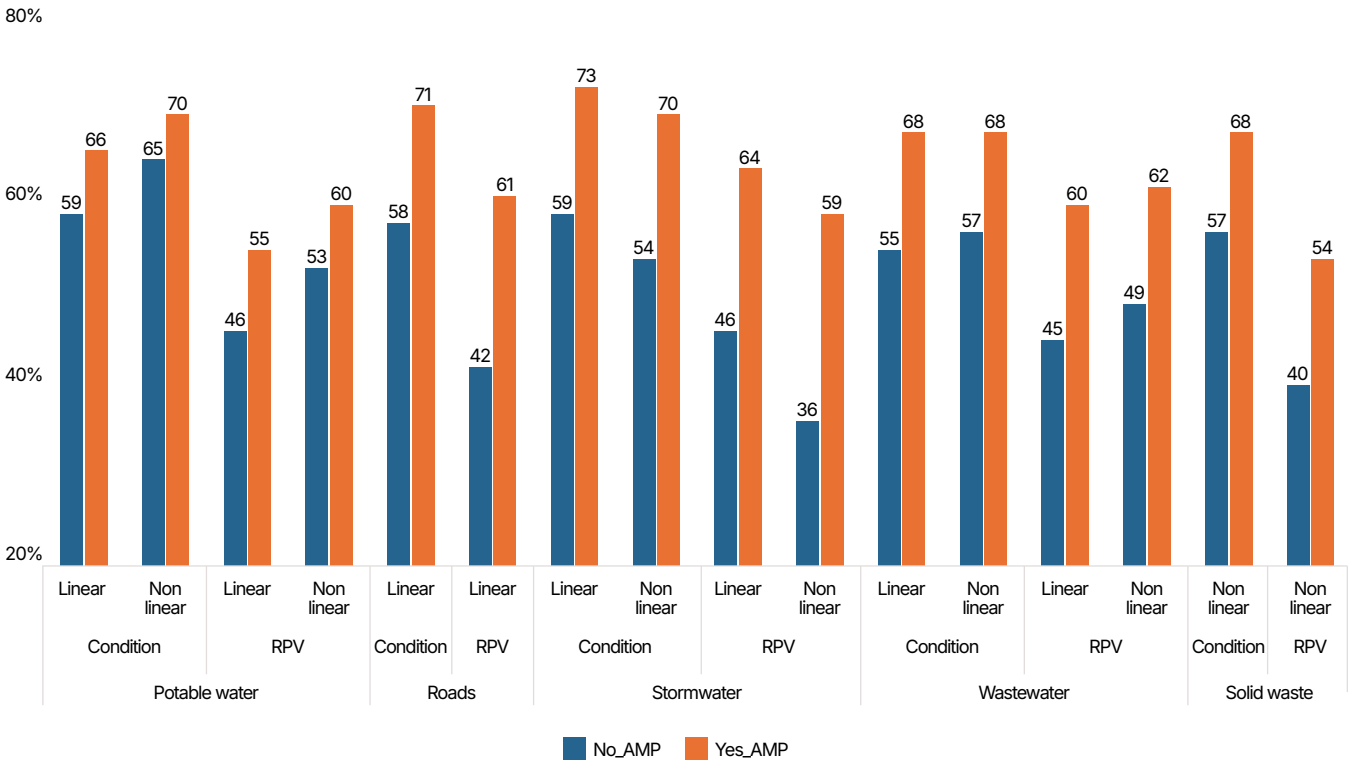
The widespread adoption of asset management planning has improved insight into Canada's infrastructure systems, and the value of this information extends well beyond individual communities. **When infrastructure data can be consistently interpreted and shared, it becomes a powerful resource for all infrastructure decision-makers** – that is, governments, Indigenous communities and organizations, investors, and industry. It can help identify national infrastructure trends, improve investment decisions, and strengthen climate resilience. It can also help decision-makers understand where existing infrastructure has capacity to accommodate growth, where it is approaching its limits, where investment is most needed, whether infrastructure is delivering the services and outcomes communities need, and how today's choices may affect future infrastructure needs and costs.

Canada's next challenge is therefore not simply to collect more data. It is to ensure that the information generated by asset management planning can be translated into infrastructure intelligence – that is, **consistent, decision-ready information that supports asset performance, planning, and investment across jurisdictions while respecting local priorities and flexibility.**

Infrastructure data is improving, but remains difficult to translate

Data from Canada's Core Public Infrastructure (CCPI) survey suggests that municipalities with documented asset management plans are more likely to rely on their own condition assessments and replacement value estimates than municipalities without formal plans (see Figure 1). This suggests that asset management planning is associated with stronger local infrastructure information.

Figure 1: Use of "Own Reporting" for Infrastructure Condition and Replacement Values, by AMP Status (Municipalities, 2022)[ii]



Source: Statistics Canada, CCPI, 2022 public-use microdata.
Note: All numbers are percentages.

Figure 1 also illustrates an important limitation. Even among municipalities with formal asset management plans, reporting remains incomplete across every major infrastructure asset class. However, this gap in national reporting does not necessarily mean that more detailed information does not exist locally. Differences in asset classification, condition-rating systems, and valuation methods, and data collection and assessment practices can make local information difficult to translate into common reporting categories and datasets.

ii Note: Percentages represent the share of municipalities reporting their own information for at least one asset within each infrastructure category. They reflect how many municipalities use their own data, not how complete their data are across all of their assets. For example, a municipality with its own condition data for some, but not all, roads assets would still be counted as using its own data for roads. The number of municipalities represented may vary by infrastructure category because not all municipalities own or report on each type of infrastructure. "Linear" and "Non-linear" refer to CCPI asset groupings: linear assets include categories such as roads and pipes, while non-linear assets include categories, such as pumping stations, treatment wplants, and transfer stations, among others.

The CCPI survey captures whether municipalities have asset management plans and how they report infrastructure information, but it provides limited insight into the quality of those plans, the maturity of organizational practices, or the extent to which asset management influences investment decisions. Municipalities and local governments also rely on a wide range of asset management systems – from advanced software platforms to spreadsheets and paper-based records – reflecting differences in organizational capacity, available resources, and infrastructure complexity.

All this to say, existing national datasets provide only a partial picture of the information communities hold.

Data interoperability is the next move

As infrastructure information is increasingly used beyond the municipal level, the challenge shifts from collecting data to interpreting it consistently. Communities collect infrastructure information for different operational purposes using their own asset classifications, condition rating systems, valuation methodologies, lifecycle assumptions, and software platforms. While communities may be familiar with their own systems and approaches, these differences can create challenges when information needs to be shared, compared, or combined across jurisdictions.

However, this issue becomes challenging when infrastructure information is aggregated across jurisdictions to inform provincial planning, national reporting, or federal and private sector investment decisions. Common indicators, such as asset condition ratings or remaining useful life, are often measured using different definitions and scales, making direct comparisons difficult without additional interpretation. Even where communities are reporting similar information, differences in methodology can reduce confidence in the analysis and make it more difficult to identify trends or establish comparable measures of infrastructure needs. Understanding how information was collected, assessed, and reported is therefore often as important as the information itself when interpreting results across jurisdictions.

Importantly, improving interoperability does not require communities to adopt identical asset management systems or reporting practices. Canada's diversity of communities means that local governments will continue to manage infrastructure in ways that reflect their own priorities, governance structures, and operational realities. Rather, **interoperability requires sufficient consistency in definitions, classifications, and data exchange, along with clear documentation of how information is produced, to allow local information to contribute to a broader understanding of the performance of Canada's infrastructure systems.** By establishing a common language for infrastructure data, locally-generated information can be more readily combined and interpreted to identify broader trends in infrastructure condition, capacity, risk, and investment needs. This can support better planning and investment decisions beyond individual communities while preserving local ownership and flexibility.

This balance between consistency and flexibility is already being put into practice in parts of Canada. British Columbia's Local Government Data Entry (LGDE) system – profiled below – illustrates how reporting requirements can gradually evolve to strengthen infrastructure data while allowing communities and local governments to continue using the asset management systems that best reflect their local circumstances.[18]

Leading Practice: British Columbia (BC)'s Local Government Data Entry (LGDE) System

BC's LGDE system illustrates how infrastructure reporting can evolve alongside asset management maturity. Rather than introducing comprehensive reporting requirements all at once, the Province has gradually expanded reporting requirements over time, improving data consistency while recognizing differences in local capacity.

The LGDE system originally focused on financial reporting, including historical asset costs, asset additions, and whether communities had asset management plans or risk registers in place. As asset management practices matured, reporting requirements evolved to include more decision-oriented information. Several data fields that were initially optional – including asset age, replacement value, and condition data – became mandatory in 2025, reflecting a shift toward reporting that better supports lifecycle planning and long-term infrastructure sustainability.

Today, communities and local governments report aggregated data by asset class (e.g., replacement value, average asset age, remaining useful life, condition ratings, and asset performance). The LGDE system also captures information on organizational maturity, such as asset management policies, integration of long-term financial planning, risk assessments, and built and natural assets inventories. These reporting requirements provide the Province with a more consistent understanding of local infrastructure while allowing communities and local governments to use asset management systems that reflect their own operational realities.

The LGDE system is also designed to accommodate differences in community size and capacity. Rather than requiring detailed asset inventories, it collects aggregated information by functional asset category, allowing communities and local governments to report from existing asset management systems. This approach supports broad participation while providing comparable indicators on asset condition, replacement value, remaining useful life, and long-term financial sustainability. However, reporting frameworks are only as strong as the data they receive. Communities and local governments must still translate information from their asset management systems into common reporting categories, and differences in definitions and methodologies

can reduce comparability. This is evident for natural infrastructure, where natural asset inventories may exist but information on their condition and value is limited.

Standardized reporting is an important step toward better infrastructure intelligence, but it is not sufficient on its own. Common reporting expectations in the LGDE system strengthened asset inventories, lifecycle information, and better integrated engineering, finance, and long-term planning. But a more coherent picture of Canada's infrastructure requires greater alignment in the underlying data definitions, classifications, and common data fields used across asset management systems.

Emerging climate priorities are exposing new data gaps

As asset management practices continue to mature, infrastructure decision-makers are seeking information that extends beyond traditional asset inventories and lifecycle costs. Climate resilience, natural infrastructure, service reliability, and long-term performance are becoming increasingly important considerations in infrastructure planning. These emerging priorities require data that many existing asset management systems were not designed to collect.

Across Canadian communities, the collection of data on climate-related infrastructure damage, service disruptions, and long-term climate impacts remains limited, fragmented, and inconsistent. While there is growing recognition of escalating climate risks, most available cost estimates are derived from top-down modelling studies rather than systematically recorded municipal data. This makes it difficult to integrate climate considerations into routine asset management, compare impacts across jurisdictions, or evaluate the effectiveness of resilience investments over time. For instance, analysis by the Financial Accountability Office of Ontario estimates billions in additional infrastructure costs due to climate change, yet it acknowledges that governments lack reliable analytics to integrate these costs into routine planning in practice.[19] At the national level, recent Canadian Climate Institute research estimates that proactively adapting public infrastructure to extreme rainfall and heat could save governments between $4.1 billion to $8.6 billion annually in maintenance and replacement costs.[20]

Integrating natural infrastructure into asset management planning presents a similar challenge. Wetlands, forests, floodplains, and other natural assets are increasingly recognized for the important infrastructure services they provide, including flood mitigation, stormwater management, and climate adaptation. However, their incorporation into formal asset management systems remains limited. Although initiatives, such as the Natural Assets Initiative, emerging standards development work across the CSA, the Standards Council of Canada, and National Research Council, and provincial policies (i.e., Ontario's requirement to integrate natural infrastructure into municipal asset management plans), are beginning to support more consistent practices and efforts to collect and publish standardized national data in this area have encountered difficulties (e.g., attempts to gather information through the CCPI survey have not yet produced data of

sufficient quality for publication). As natural asset management practices continue to evolve, working with Indigenous communities and rights holders will also be important, particularly because natural systems and the services they provide can extend across jurisdictional, rights, title, and ownership boundaries.

Provinces, territories, and communities increasingly recognize the importance of incorporating climate risks and natural infrastructure into asset management, but many lack the technical capacity, data, and specialized expertise needed to do so effectively. These challenges are particularly pronounced in smaller, rural, remote, northern, and Indigenous communities, where limited staffing and financial resources make it difficult to undertake climate risk assessments, maintain detailed datasets, or incorporate forward-looking climate projections into lifecycle planning.[21] As a result, climate considerations are often acknowledged in high-level strategies but are not systematically embedded within asset inventories, condition assessments, risk models, or long-term capital planning. This challenge is compounded by the fact that climate risks are uncertain, non-linear, and often operate across long time horizons and multiple spatial scales; this makes it difficult to incorporate them into asset management approaches that have traditionally relied on historical performance and predictable asset lifecycles.[22]

Despite these challenges, communities across Canada are beginning to demonstrate practical approaches to integrating natural infrastructure into asset management. While these efforts remain at an early stage and vary considerably in scope, they illustrate how communities can use pilot projects to begin building inventories, improve data, and incorporate natural assets into long-term infrastructure planning.[23] Saskatoon's experience provides one example of this incremental approach.[24]

Leading Practice: Saskatoon is integrating natural assets into asset management

The City of Saskatoon is one of several Canadian communities exploring how natural assets can be incorporated into asset management. Rather than viewing wetlands, grasslands, and urban forests solely as environmental features, the City has begun identifying, mapping, and valuing them alongside built infrastructure to better understand the services they provide, such as managing stormwater, reducing flood risk, and improving climate resilience.

Saskatoon's work has been incremental. It began by developing an inventory of natural assets, followed by a pilot project to estimate their value and the services they provide to the community. That work is now informing the City's Green Infrastructure Strategy and Natural Area Management Plans, helping integrate natural assets into long-term planning and investment decisions.

The City's experience demonstrates that integrating natural infrastructure into asset management does not happen all at once. It begins with better information. By identifying natural assets, understanding the services they provide, and gradually incorporating them into planning and investment decisions, communities can strengthen climate resilience while building more complete infrastructure datasets for the future.

Key Takeaways

Asset management systems were largely designed to support the management of built infrastructure under historical conditions. **As infrastructure systems become increasingly interconnected and climate risks become more complex, asset management must also evolve.** Improving the collection, consistency, and interoperability of climate and natural infrastructure data will be essential to ensuring that infrastructure decision-makers can make informed, forward-looking investment decisions.

This evolution can be incremental. Practical examples show that communities can start by building better information, and gradually integrate it into asset management planning and investment decisions.



A Practical Agenda for Infrastructure Intelligence

The first National Infrastructure Assessment report helped establish a national picture of Canada's infrastructure needs and highlighted persistent gaps in the data available to support long-term planning. This paper takes that work a step further by identifying how locally generated asset management information can become more consistent, usable, and decision-ready across jurisdictions.

> Canada does not need one national asset management system; it needs interoperable data and sustained local capacity.

To achieve this, the Council recommends:

1 Establish a common language for infrastructure data

Governments should work with Indigenous communities, industry, and standards organizations to identify opportunities for greater alignment in infrastructure data fields, definitions, and reporting conventions that enable information to be translated and compared across jurisdictions. The objective should not be to standardize local asset management systems, but to improve the interoperability of infrastructure data so that locally collected information can help decision-makers identify infrastructure needs and capacity, compare priorities, and make better-informed investment decisions at all levels – local, regional, provincial/territorial, and national. In other words, all parties benefit from improving the quality and comparability of data.

How greater alignment is achieved should reflect different jurisdictional contexts and existing approaches to asset management. Where appropriate, this work could build on existing data collection and reporting processes, including the CCPI and standards such as ISO 55000, both to avoid increasing the reporting burden and to provide value back to communities by making their own information easier to use for planning and investment decisions.

In practice

This should include:

- **Agreeing on a minimum set of core infrastructure data fields** (e.g., asset type, condition, replacement value, remaining useful life, service levels, and, where relevant, capacity and use or demand), aligned where possible with existing reporting processes to reduce duplication and make information easier to reuse;
- **Developing common definitions** and metadata for these fields, including sufficient documentation of assessment methods to support consistent interpretation across jurisdictions;
- **Documenting methodologies for condition assessments and lifecycle assumptions** to improve comparability; and,
- **Supporting data exchange protocols** that allow different asset management systems to communicate while preserving local flexibility.

2 Increase investment in long-term asset management capacity

The next phase of asset management will depend as much on people as on technology. Governments should increase investments in capacity building so that communities can build and maintain high-quality asset management practices, integrate asset management into routine decision-making, and improve the quality of infrastructure data over time. Particular attention should be given to smaller, rural, remote, northern, and Indigenous communities, where capacity constraints remain most significant.

In practice

This should include:

- **Sustaining and increasing investments in training, technical assistance, and peer-learning** networks;
- **Supporting communities in maintaining and updating asset management practices, processes, and supporting systems,** rather than focusing solely on preparing plans;
- **Developing practical tools and guidance** that reflect different levels of organizational maturity; and,
- **Encouraging partnerships** between governments, municipal associations, Indigenous organizations, academia, and industry **to strengthen technical expertise.**

3 Expand models for shared technical services

Many communities lack the resources to employ dedicated specialists in areas, such as engineering, asset management, climate risk assessment, data management, or financial analysis. Expanding collaborative service models would allow communities to access specialized expertise while improving consistency and reducing costs.

In practice

This should include:

- **Establishing regional asset management hubs or centres of expertise;**
- **Supporting shared engineering and asset management services** across neighbouring communities;
- **Developing technical advisory teams** that can provide targeted support to smaller communities **(i.e., "plug-and-play" teams);**
- **Supporting capacity building opportunities in remote and northern communities** that enable sustainable local expertise; and,
- **Encouraging knowledge-sharing networks** that connect practitioners across jurisdictions.

4 Make asset management more forward-looking

Asset management should continue to evolve beyond understanding the current condition and lifecycle of existing assets to better anticipate the conditions in which infrastructure will need to perform. This means integrating forward-looking risks and information, particularly climate risk and natural infrastructure, into lifecycle planning, risk assessment, and investment decisions.

In practice

This should include:

- **Updating asset management guidance, standards, and tools** to better incorporate forward-looking risks and changing infrastructure needs;
- **Improving how natural infrastructure and climate-related information is identified and incorporated** into asset inventories and infrastructure datasets;
- **Integrating climate risk and resilience considerations into lifecycle planning, risk assessments, and capital investment decisions;** and,
- Continuously improving asset management systems and analytical tools to **incorporate new data, technologies, and emerging infrastructure risks** over time.

Conclusion

The next evolution of asset management is expanding development and adoption to more communities, generating better information to support infrastructure decisions, sharing data across jurisdictions, and making support available to deploy the data for better infrastructure planning and delivery. Building on these findings, the Council's second National Infrastructure Assessment will identify practical ways to help communities make the best use of existing assets, strengthen their long-term resilience and prepare for Canada's future infrastructure needs.

Endnotes

1 International Organization for Standardization (ISO). ISO 55000: Asset Management - Vocabulary, Overview and Principles. 2024.

2 Institute of Public Works Engineering Australasia (IPWEA). International Infrastructure Management Manual. IPWEA, n.d.

3 Alberta Municipal Affairs. PSAB 3150 Toolkit: Tangible Capital Asset Accounting. Government of Alberta, n.d.

4 Housing, Infrastructure and Communities Canada. Build Communities Strong Fund. Government of Canada, 2026.

5 Government of Saskatchewan. Asset Management: Making Progress. Government of Saskatchewan, n.d.

6 Government of Nova Scotia. Asset Management Program. Government of Nova Scotia, n.d.

7 Asset Management BC. Asset Management Framework. Asset Management BC, n.d.

8 Gouvernement du Québec. Programme de la taxe sur l'essence et de la contribution du Québec (TECQ) 2019-2024. Gouvernement du Québec, n.d. (in French only).

9 Housing, Infrastructure and Communities Canada. Build Communities Strong Fund: Community Stream (Nunavut). Government of Canada, n.d.

10 New Zealand Government. Local Government Act 2002, Section 101B: Infrastructure Strategy. 2002; Office of the Auditor-General New Zealand. Matters Arising from Our Audits of the 2021–31 Long-Term Plans: Part 3 – Infrastructure Strategies. 2022; Office of the Auditor-General New Zealand. Asset Management and Long-Term Planning: Learning from local government long-term planning. 2023; UK Department for Transport. Statutory Guidance: Local Transport Plans. 2026; UK Department for Transport. Guidance: Accessing Local Highway Maintenance Incentive Funding. 2026; Institute of Public Works Engineering Australasia (IPWEA). NAMS+ A Toolkit for Asset Management Planning. n.d.; Local Government Victoria. Asset Plan Guidance. 2022; Local Government Victoria. Local Government Asset Management Better Practice Guide. 2015; New South Wales Office of Local Government. Integrated Planning and Reporting. 2026; New South Wales Office of Local Government. Integrated Planning and Reporting: Guidelines for Local Government in NSW. 2021.

11 Federation of Canadian Municipalities. Municipal Asset Management Program (2017-2024). Federation of Canadian Municipalities, n.d.

12 Centre d'expertise et de recherche en infrastructures urbaines (CERIU). Outils pour la réalisation d'un plan de gestion des actifs municipaux (PGA). CERIU, n.d. (in French only),

13 Ontario First Nations Technical Services Corporation (OFNTSC). Asset Management, n.d.

14 Federation of Canadian Municipalities. Guide for Integrating Climate Change Considerations into Municipal Asset Management. Federation of Canadian Municipalities, n.d.

15 Natural Assets Initiative. Natural Asset Management. Natural Assets Initiative, n.d.

16 Natural Assets Initiative. About NAI. Natural Assets Initiative, 2026.

17 Housing, Infrastructure and Communities Canada. Assets and Infrastructure Hazards. Government of Canada, n.d.

18 Government of British Columbia. Local Government Data Entry and Reporting System (LGDE) Help Manual. Government of British Columbia, n.d.

19 Financial Accountability Office of Ontario. CIPI: Summary Report - Estimating the Budgetary Impacts of Changing Climate Hazards on Public Infrastructure in Ontario. November 22, 2023.

20 Canadian Climate Institute. Prepare or Repair: Climate-Proofing Public Infrastructure. Canadian Climate Institute, 2026.

21 Housing, Infrastructure and Communities Canada. Evaluation of the Municipalities for Climate Innovation Program and Municipal Asset Management Program. Government of Canada, n.d.

22 Green Municipal Fund. Natural Assets Bolster Climate Resilience. Federation of Canadian Municipalities, n.d.

23 Green Municipal Fund. Measuring the Value of Natural Assets. Federation of Canadian Municipalities, n.d.

24 City of Saskatoon. Natural Capital Asset Valuation Pilot Project. City of Saskatoon, 2020; City of Saskatoon. Pathways for an Integrated Green Network: An Implementation Plan for Saskatoon's Green Infrastructure Strategy. City of Saskatoon, 2022; and, City of Saskatoon. Natural Area Management Plans. City of Saskatoon, 2024.