

PUBLIC POLICY PRIORITIES

Climate Resilient Infrastructure

Planning

Local governments – particularly in rural and remote areas – often have relatively small revenue bases but are responsible for most road transport network maintenance. There is also often a disconnect between expenditures on roads and usage, resulting in spending that is inequitable and inefficient. New technologies are enabling the collection of valuable data, which allows governments and operators to better understand user needs, can be used for planning and service delivery, and is opening new revenue streams for transport operators and network users.

Travel patterns, particularly in urban centers, are becoming increasingly complex. Prior to the pandemic, ride and carsharing were beginning to change how people get around and the outlook for electric and connected vehicles had implications for the future of transport. The pandemic has further complicated the picture in urban areas, with public transit ridership – and the fares that help support it – plummeting. Demand may remain at low levels as remote work, virtual services and concerns about hygiene and disease transmission linger. Low densities and long distances outside of urban areas also contribute to transport networks and travel patterns that are poorly integrated. As a result of all these trends, there is a growing divergence between the way networks are planned and designed, and the needs of citizens. The trend toward electric and connected vehicles will require significant investments in fueling and network infrastructure. Rural and remote communities do not have the economies of scale to justify private investment in charging infrastructure and without charging infrastructure, not only will users in these areas face barriers to adoption of electric vehicles, but the continuity of the network is impeded. There is also a lack of regulation, testing and road infrastructure upgrades to support the use and functionality of connected vehicles.

Joint- and shared-use community and recreation infrastructure can solve space constraints in urban centers and funding constraints in rural and remote areas, improving access to high-quality infrastructure for the public and reducing costs for users and operators. Open

space and parks are integral to a sense of community. Good planning, active asset management of open space and park infrastructure, and strong linkage to the natural environment and heritage system ensure the viability of these amenities. It is not just providing and building new space, but ensuring existing spaces are well maintained, safe, healthy and appealing.

Resilience

The increased number and severity of natural disasters resulting from a changing climate puts public infrastructure at risk. Failing public infrastructure disrupts essential services, results in economic loss, and can lead to loss of life – and yet civil engineering infrastructure projects are falling behind societal and functional expectations.

Infrastructure Canada's Climate Lens

recognizes that infrastructure investments can more successfully address environmental pressures and climate change impacts by encouraging the incorporation of climate change considerations into the project development process. Foreseeing the need for such considerations, the American Public Works Association (APWA), the American Council of Engineering Companies (ACEC), and the American Society of Civil Engineers (ASCE) established the Institute for Sustainable Infrastructure (ISI) in 2010. ISI's Envision sustainability rating tool is a holistic framework for evaluating and rating the community, environmental and economic benefits of all types of infrastructure projects and is accepted as a Climate Lens methodology to assess climate change risk and resilience. Envision also recognizes infrastructure projects that use transformational, collaborative approaches to assess sustainability indicators over the course of a project's life cycle. **Continuing to direct public funds towards public infrastructure projects that are planned and executed using sustainability rating systems such as Envision is key to ensuring safe, healthy communities.**

Some public works agencies are also factoring into their capital and operations plans the value of natural assets that provide core municipal services, such as wetlands that improve water quality and provide protection

from storm surges and vegetated spaces that stabilize soil and absorb stormwater. According to a 2018 report published by the Insurance Bureau of Canada (IBC) and several partners, [Combatting Canada's Rising Flood Costs: Natural infrastructure is an underutilized option](#), conservation and restoration of natural infrastructure can be a cost-effective way to mitigate material financial losses that would otherwise result from flooding. The report cites:

- Naturally occurring ponds in the coastal town of Gibsons, British Columbia, provide \$3.5 million to \$4 million of stormwater storage services annually
- A 250-metre naturalized channel in the town of Oakville, Ontario, provides \$1.24 million to \$1.44 million of stormwater conveyance and storage annually
- Naturally occurring wetlands in southern Ontario reduce flood damage costs to buildings by \$3.5 million (or 29%) at a rural pilot site and by \$51.1 million (or 38%) at an urban pilot site
- A restored and engineered wetland in Manitoba is valued at \$3.7 million for the flood reduction, water quality improvement, carbon sequestration and other benefits it provides.

Unlike engineered assets that have a defined lifespan, after which they must be repaired or replaced, natural assets may provide services in perpetuity. But they must be protected and recognized for their value, which may increase as the climate changes.

Recommendations:

- Continue to encourage investment in public infrastructure projects that are planned and executed using sustainability rating systems such as Envision.
- Continue to encourage infrastructure investment strategies that recognize the value, and include the management and sustainability, of natural assets.

Funding

According to Infrastructure Canada, [municipal governments own 59.8% of public infrastructure](#). But according to the Canadian Union of Public Employees, [local governments only collect about 12 cents of](#)

every tax dollar paid in Canada. Investment in local infrastructure – revitalizing town centers, transforming bus services and cycling infrastructure, boosting connectivity – is critical, but small communities with limited resources often don't have the capacity to compete for application-based funding and grants. Challenges with application-based funding programs include:

- Not enough advance notice of program requirements and timelines
- Limited time to apply
- Complicated and time-consuming application process
- Unclear or changing program requirements
- Delays in project approval
- Inability to modify applications
- Onerous reporting requirements

Local governments rely on the federal [Canada Community-Building Fund \(CCBF\)](#) to deliver public works and infrastructure projects across 19 different categories, including roads and transit, drinking water and wastewater infrastructure, solid waste management, disaster mitigation and broadband. This permanent source of funding, which flows through provinces and territories, is provided up front, twice-a-year and enables municipalities to plan capital infrastructure investments more quickly and effectively than application-based funding programs. In addition, encouraging partnerships – regional, between large and small municipalities, and within counties – in the structure of funding programs, would enable municipalities with means to leverage their resources for the benefit of municipalities who would otherwise be shut out.

Infrastructure is more expensive to provide per unit of consumption in areas with low population density, but residents and businesses in these areas are also more reliant on infrastructure for their productivity and wellbeing. Small communities and small projects may not be able to attract private investment, but the federal government might act as a clearinghouse to pool smaller projects at a scale that would attract private investment.

Operations and Maintenance

The Government of Canada's one-time doubling of the CCBF (formerly the Gas Tax Fund) announced in Budget 2019 recognized the needs of local governments across Canada, particularly as they meet the challenges of managing aging public infrastructure in an era of increased and severe weather events. But the CCBF cannot be used for operations and public works agencies often do not have adequate

resources for the operations and maintenance activities that keep existing infrastructure in good working condition.

Short budget and funding cycles, inadequate asset management, insufficient data, and decades of underinvestment in preventative maintenance have contributed to a maintenance funding backlog across infrastructure sectors, which is eroding quality and reliability and leading to higher costs for future asset maintenance and renewal. For instance, many water utilities face mounting costs to maintain, renew and upgrade aging water and wastewater assets, but limits on the rates that users pay, affordability for low-income earners, and shifts in usage are leading to declining reliability and quality, heightened risk of asset failure, and a mounting funding backlog. Investments in operating and maintaining existing infrastructure, like the [UK's Roads Maintenance Funding](#) – including the Potholes Fund to fix potholes and resurface roads – is much needed as the Canadian public's expectations for level of service remain high and continue to rise, but municipal funding sources remain limited and revenues decline. Many citizens also have a limited understanding of the costs associated with their use of infrastructure – especially ongoing maintenance needs. Promoting operations and maintenance projects with signage and publicity, similar to new construction, would raise public awareness about both government spending and infrastructure needs. New technologies and data collection and transparency can also increase the public's access to information and understanding of public investment in infrastructure services.

Recommendations:

- Continue direct funding to local communities through an increase to the federal Canada Community-Building Fund.
- Expand federal funding programs to include operations and maintenance activities.

Innovation

How infrastructure is provided and used will transform in the coming decades so laws and regulations will need to change and adapt if Canada is to remain innovative and globally competitive. New technologies are expected to increase transparency around the total cost of infrastructure – transport, energy, water, telecommunications, sanitation and recreation – and to provide the opportunity for consumers to adjust demand, invest in alternatives or replace traditional services. Program parameters must consider a long-

term view of investment and be based on total lifetime value rather than first cost. Federal funding programs with short windows for notification, application and completion of projects, as well as highly prescriptive performance and reporting requirements, can discourage participation – particularly from under resourced communities that might most benefit – and result in higher prices that factor in more complexity and higher risk.

An approach that continues to recognize the unique requirements of urban, rural and remote communities when considering standards and program parameters will be essential for effective programs.

The adoption of zero-emission vehicles will require significant investment in fueling/charging infrastructure. Municipalities can transition their fleets to zero-emission vehicles and assist in the deployment of infrastructure, but municipal budgets may not accommodate the up-front costs. Additionally, the maintenance of zero-emission vehicles and training of maintenance technicians and operators must be factored into municipal budgets and decision-making. Skills training and capacity building should be included in federal funding programs meant to support the adoption of zero-emission vehicles. Innovative financing similar to energy performance contracting and green bonds could support upfront costs paid back through expense avoidance savings. Zero-emission vehicles might also be included in the [Canadian Collaborative Procurement Initiative](#).

Many municipal functions and public works infrastructure are significant energy users. Pumping and treatment processes are energy intensive. The ability for energy recovery through treatment and biosolids processes, alternative energy sources (natural gas, solar, wind) to power facilities, energy efficient equipment selection, as well as carbon footprint conscious sourcing of materials, equipment and resources will all support the transition to a net-zero economy and help meet climate objectives.

Recommendations:

- Include the costs of operations and maintenance activities in the design of federal funding programs meant to support the adoption of new and innovative technologies.
- Fund professional development, skills training, and capacity building initiatives to support the adoption of new and innovative technologies.
- Consider federal innovative financing programs and collaborative procurement to support municipalities with the upfront costs of new and innovative technologies.