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Standing Committee on Transport, Infrastructure and Communities
Sixth Floor, 131 Queen Street
House of Commons
Ottawa, Ontario
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Sent via email: TRAN@parl.gc.ca

Re: Study on Adapting Infrastructure to Face Climate Change

Dear Committee Members,

Thank you for the opportunity to provide our perspective for your study on how to create communities that are more resilient and sustainable in the face of climate change (infrastructure and housing), including the implementation of more resilient infrastructure and building products.

The Canadian Public Works Association (CPWA) was founded in 1986 to enhance the services of the American Public Works Association (APWA) to the Canadian public works community. Since that time, CPWA has become the voice of public works in Canada, with a board of directors filled by public works professionals from municipalities across Canada, and chaired this year by Mike Walker, Assistant Director of Engineering and Operations for the city of Fredericton, New Brunswick. Collectively, APWA and CPWA represent over 30,000 public works professionals in North America who work on both sides of the border to innovate and assure excellence in the public works profession.

Public works professionals are on the front lines of the climate change challenge. When disasters strike, it's public works professionals who are often the first ones on the scene as emergency first-responders, clearing roads from snow or downed trees for emergency vehicles to get through; restoring power during blackouts; or ensuring that water systems are operational for fighting fires.

The CPWA believes it is imperative that public infrastructure investments are supported by strong

asset management systems that have an eye to the impacts of climate change; that they are managed effectively; and that funding formulas and application innovations for infrastructure recognize the unique nature of both rural and urban jurisdictions.

In order to achieve these objectives, while at the same time improving individual and commercial productivity by providing sustainable, safe and healthy places to live, work, play and invest, the CPWA has long recommended that attention be focused on the following three key themes, which this submission will address in more detail:

- Emergency management and disaster mitigation,
- Climate resilient infrastructure, and
- Water resilience.

Emergency Management and Disaster Mitigation

CPWA recognizes that the federal government is dedicated to working collaboratively with provinces and territories to support communities when disasters strike and that Public Safety Canada provides oversight and guidance in the setting of exercise priorities and co-sponsors key activities with lead departments through the Emergency Management National Exercise Program. It is also important to consider the role of local governments.

Public works agencies operate and maintain critical infrastructure services that are vital to communities, such as transportation networks, energy and water supplies, sewage and refuse disposal systems, and public facilities. Public works agencies are also responsible for many aspects of emergency planning and disaster response, including assessing damage to buildings and infrastructure; clearing and disposing of debris; removing snow in blizzard conditions ahead of police and fire services; securing critical facilities and restoring lifeline services; managing traffic and coordinating municipal vehicles, equipment and manpower; and ensuring a safe public water supply. In 2017, APWA announced the creation of a “Public Works First Responder” symbol for use throughout North America to identify public works personnel and acknowledge their role as first responders.

Public Safety Broadband Network

Communication is increasingly recognized as a critical component of operating public infrastructure and public works agencies must be able to depend on reliable interoperable emergency communications systems that connect them during preparedness, response and recovery operations to other first responders, including law enforcement, fire, emergency medical professionals, and other public works agencies. Communications interoperability is particularly critical when emergency responders provide mutual aid to other communities.

In March 2022, the Temporary National Coordination Office (TNCO) published a final report, A Public Safety Broadband Network for Canada: A Canadian Approach to Implementation of the Next Generation of Public Safety Communications, following a presentation to FPT Ministers Responsible for Emergency Management.

The final report includes the TNCO's recommended approach for the development of a nationwide and interoperable PSBN that meets the needs of the public safety community, and it notes that "the transition to a PSBN will be complex and will require all levels of government to support its development. Continued collaboration among all levels of government, industry and end users is essential to develop a network that meets the diverse expectations and interests of stakeholders."

In the United States, nationwide wireless broadband network FirstNet was launched in 2018 through a public-private partnership between the U.S. federal government and AT&T. APWA is a member of FirstNet's Public Safety Advisory Committee (PSAC), whose mission is to assist FirstNet in carrying out its duties and responsibilities and consists of members representing all disciplines of public safety.

Recommendation:

- In establishing and supporting the permanent Public Safety Broadband Network (PSBN), ensure the provision of communications interoperability to public works personnel as first responders.

All-Hazard Awareness-Raising Activities

Budget 2019 proposed to provide $5.0 million over five years, starting in 2019–20, to Public Safety Canada to develop all-hazard awareness-raising activities that are targeted to specific, at-risk audiences such as low-income Canadians, seniors, people with disabilities, recent immigrants, and Indigenous Peoples. The five years allotted for this funding will be running out after the current 2023-24 fiscal year.

CPWA believes that there is also a need for funding and best-practice guidance that supports public works agencies in effectively responding to disasters by enabling training, mapping, assessments of technical capability, and implementation of response and recovery plans. In addition, the final report of the Evaluation of the National Disaster Mitigation Program released by Public Safety Canada in December 2019 noted that "the majority of interviewees highlighted the need for an all-hazards program. This was considered important given the interplay between disasters."

Many public agencies, particularly in small and rural communities, need assistance developing and implementing all-hazard emergency preparedness plans, pre-disaster mitigation plans and long-term hazard mitigation measures. Public works agencies, as well as First Nations, Inuit and Métis

communities must be included in education and training efforts; have access to tools and resources, such as climate and weather forecasts, rainfall data and risk models; and have access to new technologies that can assist in emergency response activities.

Recommendations:

- Renew funding for all-hazard awareness-raising activities, and ensure that public works agencies have access to dependable, predictable funding for the development and implementation of comprehensive, all-hazard emergency preparedness plans, pre-disaster mitigation plans and long-term hazard mitigation measures.
- Encourage a collective approach to emergency management by including public works agencies, as well as First Nations, Inuit and Métis, in cross-sector task forces and study groups responsible for all-hazards education, training exercises and development of best practices.
- Encourage the development and coordination of timely information and tools to enhance and support the emergency management capabilities of public works agencies, as well as First Nations, Inuit and Métis, including coordination of Incident Management Teams.

Flood Mapping

Funding for disaster mitigation and adaptation must be available to communities of all sizes, and rural communities in particular. Small and rural communities have fewer resources for planning and delivering services is more expensive. According to Public Safety Canada, floods are the costliest natural disasters in Canada in terms of property damage. To restrict development in areas of high flood risk, federal, provincial, and territorial governments have designated a number of flood prone areas in Canada.

According to the May 2023 National Risk Profile: Strengthening Canada's All-Hazards Approach to Emergency Management, "flooding is Canada's most common and costly disaster." We are pleased that Public Safety Canada is taking steps to get recommendations on public flood risk communications content and strategies in support of the development of a Canada-wide Flood Risk Awareness Portal.

Given that public works agencies rely on flood hazard maps to plan and manage their infrastructure investments, it is critical that these resources effectively communicate all current flood hazards.

Recommendations:

- Accelerate timelines for updating Canada's flood hazard maps to show all potential sources of overland flood (fluvial, pluvial, groundwater, and coastal).

Climate Resilient Infrastructure

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.

Electric Vehicle Network Planning

Low densities and long distances outside of urban areas 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 charging 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.

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.

Climate Lens

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 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.

Recommendation:

- Directing 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.

Natural Assets

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; and
- 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.

Water Resilience

Public works agencies operate and maintain critical infrastructure services susceptible to the impact of climate change, including the delivery of drinking water supplies and the management of wastewater and stormwater. These critical water infrastructure services include:

- the management of stormwater and stormwater outfall sampling programs;
- the development and implementation of stormwater best management practices (BMPs);
- potable water flushing/dechlorination;
- wastewater lagoon release and related reporting; and
- responsibility for industrial, commercial, and institutional (ICI) source control, oversampling and inspections.

Public works agencies and municipal water providers use chemical substances to treat water for public use and automation and connected technologies are part of many water management strategies, which can be vulnerable to cyberattacks. In addition to addressing such issues as phosphorus, flushables, effluent discharge limits, and water quality, public works agencies are facing the pressure that climate change is putting on water and wastewater systems.

According to Canada's Core Public Infrastructure Survey: Potable water and stormwater assets, 2016, municipal governments own over three-quarters of every type of potable water asset but less than half reported having an asset management plan. In addition, over one-third of potable water asset owners issued a drinking water advisory in 2016. According to Environment and Climate Change Canada, most boil water advisories are issued because equipment and processes used to treat, store or distribute drinking water break down, require maintenance, or have been affected by environmental conditions. This includes issues such as broken water mains, planned system maintenance, power failures or equipment problems.

Climate change impacts are placing further pressure on water and wastewater systems. According to a 2020 report by the Federation of Canadian Municipalities (FCM) and Insurance Bureau of Canada (IBC), Canada's Future: The Cost of Climate Adaptation at the Local Level, avoiding the worst impacts

of climate change at the municipal level will cost an estimated $5.3 billion per year. Drought will result in a loss of potable water amid increased demand, permafrost degradation will lead to the rupture of water lines and storage infrastructure, sea level rise will result in saltwater intrusion, and increases in rainfall and storm surge will lead to the failure of drainage systems. The report also notes that some studies have shown that for every dollar invested in mitigation measures, $6 is saved in future damages.

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;
- Create a permanent federal funding mechanism to support and enhance the cost-effectiveness and sustainability of modern water and wastewater systems in communities of all sizes;
- Include affordability as a consideration in federal programs to ensure that disadvantaged communities are not denied essential water services;
- Support programs that assist provincial, territorial, local, First Nation and critical service entities in increasing resilience to natural hazards and with drought-related activities and expand the technology transfer of drought and water conservation strategies;
- Encourage the development of regional drought preparedness and response plans by water providers in cooperation with federal, provincial, territorial, local, First Nation and critical service entities, and require those plans mitigate the negative economic, social, and environmental impacts caused by a lack of available water; and
- Encourage planning and management efforts that include steps to reduce the vulnerability of future water interruptions, such as floods or drought.

Thank you once again for this opportunity to contribute. Please do not hesitate to contact us for any questions or if further information is needed.

Sincerely,

Mike Walker
CPWA President

Scott D. Grayson, CAE
CPWA Chief Executive Officer