Critical Infrastructure Resilience in Canada

Submitted by the Association of Consulting Engineering Companies - Canada

June 1, 2022

The Association of Consulting Engineering Companies - Canada

ACEC-Canada is the national voice of over 400 companies that provide engineering and other professional services to both public and private sector clients across Canada and the world. Our members are small, medium and large businesses that collectively employ over 60,000 Canadians. These businesses provide scientific, engineering and management expertise to identify opportunities and deliver innovative solutions. Consulting engineers are Canada's trusted advisors that are at the forefront in designing and building a more prosperous, sustainable Canada.

Introduction

ACEC-C Canada is pleased that Public Safety Canada has taken on the important task of renewing its approach to critical infrastructure (CI). ACEC-Canada's members are primarily responsible for advising on physical infrastructure, including highways, roads, bridges, dams, and buildings during the construction phase. However, built infrastructure is increasingly intertwined with manufacturing, health, government, finance, and food through highly integrated supply chains. Further, physical infrastructure is also likely to be connected and dependent upon information and communication technologies, while also enabling their delivery through electricity grid infrastructure, fibre optic cables, and other forms of transmission. In essence, our members provide professional services that touch nearly every corner of the department's discussion paper.

The Strategic Objectives of the discussion paper are well described. While we will weigh-in to a degree on the importance of some elements of critical infrastructure, we provide more insight discussing the importance of stakeholders and processes that will help governments in Canada manage the risks associated with complex and changing threats. These threats include environmental factors like climate change—adaptation, mitigation, and resilience—the potential for constrained public sector spending following years of added expenses responding to COVID-19, and the fiscal pressure of inflation on the delivery of new projects.

We answer only those questions that are germane to ACEC-Canada's expertise. Generally, we offer substantive contributions related to the process of delivering new CI, and ensuring the successful delivery and improved operations over the lifespan of these assets. We also suggest policy reforms that will enable all critical infrastructure stakeholders to have better information for adding capacity and planning for the maintenance of existing assets.

Our three priorities for Public Safety Canada's consideration are:

1. **Implementing the National Infrastructure Assessment**
2. **Providing Tools and Resources for Capacity Development**
3. **Reforming Procurement and Adoption of Qualifications-Based Selection**

The consultation asks participants to comment on key considerations, including:

- Digitalization of Systems and Processes
- Environmental Risks
- Security Threats
- Economic Prosperity

ACEC- Canada's submission will focus almost exclusively on Environmental Risks and Economic Prosperity. However, our discussion will inevitably have some applicability to the other considerations. This submission will also emphasize the CI sectors of energy and utilities, government, information and communication technology, safety, transportation and water.

Responses to Discussion Questions

1d) Are there CI sectors that are missing? If so, which ones?

We note that all infrastructure is critical to our economic, social, and environmental quality of life. However, investment in, protection of, and restoration to the critical infrastructure assets contemplated within the current definition and categories would be essential to growing, preserving and restoring other CI assets. Furthermore, because infrastructure assets are so frequently interconnected, focussing on the current ten categories would inevitably require significant focus on other assets as circumstances require.

2a) How could the government support owners and operators of CI to better understand their interdependencies?

- Education and training ✓
- Guidance documents ✓
- Modelling tools ✓
- Impact assessments ✓
- Other (please elaborate) ✓

The government can take a leadership role in ensuring that CI is better planned for, delivered, and managed throughout its lifespan with better information. There are three important factors in making this work for Canada.

The first is a policy that needs to be implemented quickly, in line with the timing of this consultation on CI. The delivery of the National Infrastructure Assessment (NIA) which would ascertain the existing state of infrastructure and inform public policy decisions on the need for, and prioritization of, long-term investment requirements.

The second is capacity development for infrastructure owners and operators in order to give them the right tools to plan, build and operate infrastructure assets that reflect current challenges. Infrastructure assets need not be large or complex to be critical. Furthermore, the vast majority of public infrastructure in Canada is owned and operated by (or on behalf of) the municipal sector. However, the capacity and resources available to the municipal sector is widely varied. Fortunately, a tremendous amount of expertise is available from both the public and private sectors. Previously, the federal government, in cooperation with the National Research Council and the Federation of Canadian Municipalities, had created the *National Guide to Sustainable Infrastructure* – also known as *InfraGuide*. This program had successfully facilitated the development and sharing of bulletins and best practices among municipalities and other infrastructure stakeholders until funding was discontinued in 2008. ACEC- Canada recommends that the federal government reinstate and update this program to reflect the current state of infrastructure and realities of infrastructure investment and ownership.

The third factor is the need to reform procurement so that it aligns with public policy objectives, including resilience. Procurement decisions have lasting impacts on the suitability, effectiveness, reliability, and resiliency of infrastructure for many decades.

Recommendations

Implementing the National Infrastructure Assessment

The National Infrastructure Assessment will provide the federal government, provincial and municipal partners, and owners and operators of other CI, with a clearer picture of the current state of infrastructure in Canada. It will also allow all governments to have a holistic view of Canada's existing infrastructure stock, with better information about the lifespan, operating costs and risks that may await on the horizon for important pieces of critical infrastructure. The benefits of the NIA will be felt especially in transportation infrastructure, energy generation and transmission systems, pipelines and other stock essential to daily life in Canadian communities.

Establishing an arms-length body, the National Infrastructure Agency, to oversee the NIA, will enable best practices and industry expertise to flow through regular updates, monitoring, and progress reports accessible to all stakeholders. Better data, and measurement of progress would make it easier for owners and operators of CI to manage their investments and project lifecycles. The NIA would also provide the added benefit of eliminating the "start and stop" cycles of infrastructure program spending and extend the horizon for infrastructure management to as far out as 30 years in the future. The industries and supply chains that plan, design, build, operate and maintain CI could make better informed investments in people, resources and technology that would make CI more resilient over the long-term. At the same time, the NIA would help to provide an integrated vision for the environment and the economy. Those principles would carry through to help reduce emissions and help infrastructure mitigate, and also adapt to, the effects of climate change over the century ahead.

The deep knowledge provided by a National Infrastructure Assessment will help all owners and operators have a greater sense of the interdependencies of Canada's existing infrastructure stock, as well as of the pieces that are added over the years ahead.

Providing Tools and Resources for Capacity Development

The *National Guide to Sustainable Municipal Infrastructure* (*InfraGuide*) was developed by the public sector for the public sector. It operated from 2001 to 2008 and was a partnership between the National Research Council, the Federation of Canadian Municipalities, and Infrastructure Canada. By providing expert insights across stakeholders, it enabled best practice reports and e-learning tools for sustainable municipal infrastructure. That capacity building did not fall on the shoulders of individual municipalities, but it made it easier for them to operate and to get results more efficiently.

Updating and promoting *InfraGuide* will help municipalities and their stakeholders deliver infrastructure that achieves both local needs and federal objectives. Previously, the National Research Council served as the secretariat for this initiative, and we believe that role should be revived. We estimate that starting up the program, updating key documents, and facilitating stakeholder engagement will cost $2 million per year over the next five years. The benefits of this renewal will be a more efficient delivery of federal infrastructure investments spurred by improved resources for municipalities looking to remediate and deliver new community assets.

Reforming Procurement and Adoption of Qualifications-Based Selection

In 2006, *InfraGuide* recommended a proven procurement process should become the gold standard for procurement of infrastructure at all levels of government, including the federal level: Qualifications-Based Selection (QBS). QBS should be adopted by the federal government as the standard practice for

infrastructure procurement. It is a best practice for the procurement of engineering and other professional services that has been mandated by law in the United States and adopted by the Province of Quebec and the City of Calgary here in Canada.

QBS ensures the best project outcomes by focussing on the costs, functionality, and resilience of infrastructure over entire life-cycle of the project. This encourages proponents to embrace quality, innovation and design-life at the earliest stages of project planning and design. Selecting the best team, with the best experience has been shown to reduce project cost overruns and limit project delays in the procurement stage and throughout construction. Furthermore, QBS results in significant life-cycle savings through innovation, operational efficiencies, and extended service-life and resilience. General contractors and sub-contractors have raised concerns that the quality of design documents have diminished in recent years. However, on projects where QBS was the mode of procurement, better quality design documents are the norm. Projects suffer from fewer change orders and questions during the initial construction phases which results in smoother overall project delivery. Owners report significantly higher levels of satisfaction upon project completion. Getting the right design, with the right project fit, delivered on time and on budget will strengthen Canada's CI for many decades to come.

Public Services and Procurement Canada (PSPC), with the support of ACEC-Canada, has implemented a QBS pilot project. The pilot has utilized QBS in the procurement of engineering services for five different government projects so far and continues to identify projects that would benefit from this procurement practice. ACEC-Canada encourages the federal government to expand the breadth and scope of this pilot project to large-scale critical infrastructure projects to ensure the highest possible value and outcome of these projects.

Taking a QBS approach when developing new infrastructure would necessarily consider the interdependencies of other pieces of CI. That is especially true if the government was procuring that CI, and required the consideration of interdependencies as part of its tender and bid process. A firm responding to a QBS tender would thoroughly consider the current and future pressures placed on that infrastructure inclusive of demands from other interdependent CI.

Conclusion

ACEC-Canada is pleased to have the opportunity to submit these recommendations to the Committee. It would be our pleasure to meet with the Committee members to further discuss our brief and recommendations. ACEC-Canada looks forward to collaborating with the Committee and is available to convene industry leaders to provide expertise and feedback on government initiatives and working to support the resiliency of critical infrastructure.