ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS

June 30, 2021
Sent via email to infc.info.infc@canada.ca

National Infrastructure Assessment- Building the Canada we want in 2050

The Ontario Society of Professional Engineers (OSPE) is the advocacy body and voice of the engineering profession. Ontario currently has over 85,000 professional engineers, 250,000 engineering graduates, 6,600 engineering post-graduate students and 37,000 engineering undergraduate students.

OSPE is pleased to present the following submission concerning the **National Infrastructure Assessment.**

Engineers on OSPE's Infrastructure Task Force have determined that the assessment lays a good foundation by seeking to address the following three priorities:

1. Assessing infrastructure needs and establishing a long-term vision;
2. Improving coordination among infrastructure owners and funders; and
3. Determining the best ways to fund and finance infrastructure

OSPE believes that a proper National Infrastructure Assessment should be guided by the following principles:

A. Prioritization of sustainable, shovel-worthy infrastructure

Proper, smart, and prioritized investment in sustainable infrastructure will help alleviate the economic burden the province is facing, while decreasing unemployment rates in several critical sectors of the economy.

A 2019 study by the University of Maryland and CANCEA in Ontario has estimated that every dollar invested in infrastructure returns approximately $3.70 in economic growth over 20 years. Developing a comprehensive project investment pipeline, which is informed by existing regulated municipal asset management plans will facilitate the prioritization of early works. Projects identified in the pipeline should be not only 'shovel-ready', but 'shovel-worthy' to provide a positive return on investment. By using and periodically refreshing these plans to select projects for investment, the government will be able to reduce application timelines and ensure a speedy and safe recovery.

It is also important to allocate funds for rehabilitating current and deteriorated infrastructure, to ensure it is able to provide benefits for both current and future generations. This will also provide the opportunity to make improvements in sustainability and resilience. In order to remain competitive globally, Canada must invest in repairing deteriorated infrastructure.

B. Full transparency on projects

To build long-term sustainable infrastructure, the government should consult appropriately with stakeholders and the communities affected. These consultations must be transparent, and information should be shared throughout the entire process. This will require working with provinces and municipalities to ensure that the infrastructure projects with the most benefits get funded and constructed.

C. Make use of a Qualifications-Based Selection (QBS) framework for procurement of engineering services

It is essential that all public infrastructure investments be transparent and return the greatest possible value for money. By adopting Qualifications-Based Selection (QBS) as its best practice for the selection of engineering consultants, the government can realize the greatest possible value for investment in its infrastructure projects.

QBS is an internationally recognized best practice for the procurement of engineering services. It is a competitive, sound, and fair process that selects firms that are best qualified for the project. This best practice has been mandated by law in the United States since the 1970s (*The Brooks Act*), and more recently in the city of Calgary and province of Quebec.

QBS protects the public interest over the life cycle of the project, including design, construction, operations, maintenance and eventual upgrading or de-commissioning. QBS is the smartest tool to ensure post-COVID-19 economic recovery throughout our country.

Benefits to Canadians:

a. Better value to taxpayers

QBS encourages innovation, which in turn drives better value on infrastructure investments. It provides accountability by ensuring that fees will directly correspond to the level of service and the value of deliverables to be provided. QBS also results in more realistic and predictable budgets and schedules for project expenditures.

b. Significant life-cycle savings

QBS maximizes the value of the consultant's contribution to a project while reducing the project's life cycle costs. Engineering typically accounts for only about 2% of the life cycle cost of a project, but dramatically impacts the cost and quality of the remaining 98%.

Likewise, a recent American Public Works Association study shows that using QBS for professional services reduces construction cost overruns from an average of 10% to less than 3% – equivalent to a savings of up to $700K on a $10M capital project.

c. Benefits for small firms

QBS enables small firms to compete by providing them a process to demonstrate their competitive advantages over larger firms, including a greater degree of niche market expertise, knowledge of the local market and involvement of senior level management in the execution of the project.

d. Promotes communication and technical innovation

Using QBS provides owners the opportunity to fully define the scope of work of the project during the selection process. This results in a project that is thoroughly thought out and fosters innovative, creative, cost and time-saving approaches to problems. It also fosters better communication and business relationships between owners and proponents as the process makes them partners in the job.

D. Listen to experts–including engineers

Engineers are key to the effective design and development of virtually all aspects of infrastructure. Engineers know that promoting public safety and the environment, while advancing a diverse and inclusive society, must also be reflected in government plans moving forward. We urge all orders of government to continue consulting engineers when it comes to transit development and the creation of other technical plans for Ontario.

E. Foster a sustainable management framework

The Organization for Economic Co-operation and Development (OECD) published a study in 2015 that stated,

> "Good governance is a necessary condition for good infrastructure delivery" and "poor governance is a major reason why infrastructure projects fail to meet their timeframe, budget and service delivery objectives. Infrastructure projects with deficient governance often result in cost overruns, delays, underperformance, underutilisation, accelerated deterioration due to poor maintenance…" [1]

Governance is defined by the standard *ISO 21505: Project, programme and portfolio management – Guidance on governance* as "the principles, policies and framework by which an organization is directed and controlled." This standard identifies elements that need to be in place to provide a good governance framework for a project, such as the authority and responsibility of the governing body, approach to risk management and framework for engagement with stakeholders.

To minimize waste, OSPE recommends that large infrastructure projects provide assurance of good governance in compliance with ISO 21505. This will support a sustainable effort and selection of "shovel-worthy" projects.

Priority #1: Assessing infrastructure needs and establishing a long-term vision;

OSPE believes that the establishment of a long-term vision is key to improving Canada's infrastructure. This vision should be guided by the need to invest in infrastructure that is sustainable in the long run and allows Canadians to move in the best ways possible.

OSPE agrees with the need to address green house gas emissions from the transportation sector. The Assessment must consider the infrastructure needed to support the transition towards a net-

[1] (Organization of Economic Co-operation and Development, 2015)

zero economy, from the sources of clean and renewable energy through the entire energy system and its end-use. OSPE is also glad that this assessment will consider the full spectrum of digital infrastructure, including underserved, rural communities.

Some of our specific recommendations include:

a. Accelerate the electrification of the transportation system, including EV adoption.

Canada should work towards a safe, green, innovative, and integrated transportation system that is able to support a clean environment, while boosting trade, economic growth, and public safety. Policies should seek to develop and foster a transportation system that works for current and future generations.

Electric motors are about 3 times more energy efficient than the internal combustion engine under ideal operating conditions. Electric vehicles (EVs) also reduce greenhouse gas emissions and take advantage of the province's largely low carbon electricity grid. Investing in EVs provides the opportunity of achieving short-term results, while allowing clean sectors to grow sustainably over time.

By increasing the uptake of EVs in Ontario and encouraging recharging during evenings, EVs will, in effect, store Ontario's surplus energy supply–which will significantly reduce the amount of surplus energy that is sold for a loss to external jurisdictions and/or curtailed; this is currently costing Ontario energy ratepayers approximately $1 billion per year.

According to the Windfall Centre, if EVs were to reach a 10% share of the total vehicle population by 2025, Ontario would experience a GDP increase of over $3.6 billion. Ontario would benefit from a growing industry that would be modern, efficient, and create new employment opportunities across the province.

The government also has the opportunity of electrifying its public bus fleet. Investments in electric public transport have an amplified positive impact since the vehicles run several hours per day. For individual consumers, EVs cost a quarter of the price to drive than gas vehicles. This means, the average Canadian driver, who travels 20,000km per year, would save as much as $2,000 per year on fuel alone.

To ensure Canada and Ontario accelerate the electrification of its transportation system, the federal government should:

i. Work with the provincial and municipal governments to allocate specific resources to the electrification of the public transportation system.
ii. Develop and implement an incentive program for electric vehicles, until mass adoption "tipping point" is achieved.
iii. Establish a robust network of electric vehicle charging stations across Canada.

b. Invest in 5G deployment through an efficient, flexible, and sustainable approach to spectrum management and network coverage, in consultation with the engineering community.

COVID-19 has placed an unprecedented demand on communication networks. With more individuals working from home, network bandwidth and reliability have become key issues of concern for all levels of government. The demands on the network are only expected to increase

as Canada progresses through its digital evolution in its effort to remain competitive.

The development and deployment of 5G-networks is expected to fuel Canadian innovation. The potential benefits will diffuse across various sectors including but not limited to manufacturing, transportation, agriculture, and healthcare. The features of 5G such as ultra-low latency, high bandwidth and improved machine-to-machine communication will enable a wide range of applications. According to the Canadian Wireless Telecommunications Association, 5G is expected to generate $40 billion of annual GDP by 2026 and create 250,000 new jobs. Disruptive technologies such as autonomous vehicles, artificial intelligence, smart city applications, and quantum computing will be maximized when combined with 5G networks.

In addition, 5G deployment has the potential to significantly improve the digital divide between rural and urban Canadians. The Canadian Government has committed to achieving 95% broadband coverage across the country by 2026. According to a report by Accenture, 5G fixed wireless access technology is one way to improve rural connectivity, addressing the challenges related to last-mile network infrastructure, at a lower cost than Fibre-to-the-Premise (FTTP) deployment.

To make 5G a reality, the federal government must:

a. Consult with the engineering community, who are the technical experts in the field. Without this expertise, 5G deployment will continue to hit various roadblocks and could impact Canada's ability to innovate and compete with other nations.
b. Support mobile operators in the deployment of 5G technology by generating cost effective options.
c. Work with provincial and municipal governments to facilitate critical infrastructure build as efficiently as possible.

OSPE also believes the government should work towards developing greater transit connectivity between Canada's cities and their international airports. This will enable local, regional and national economies to better compete in this globally competitive market. In order to achieve this, the federal government should support regional planning efforts, and continuous dedicated funding for strategic sustainable transit projects.

Priority #2: Improving coordination among infrastructure owners and funders

OSPE understands the need for the Assessment to promote coordination among infrastructure owners and investors. There must be an established federal/provincial collaboration mechanism, as well as a formalized stakeholder consultative system.

Engineers support the need for a coordinated and more streamlined approach to government regulations, standards, codes, and program parameters. There should also be cross-jurisdictional coordination in project planning and delivery, that encourages integrated infrastructure: planning/design to get more value out of a given infrastructure investment by addressing multiple community needs.

OSPE also supports the need for the federal government to build basic conditions and requirements into programs for transferring infrastructure funding to the provinces. These

conditions should not be overly restrictive but should ensure that federal funding is directed to infrastructure projects that are sustainable in the long run.

Priority #3: Determining the best ways to fund and finance infrastructure

It is important that the National Infrastructure Assessment provide a stable planning environment to inspire the private sector to invest with confidence.

The Canada Infrastructure Bank should take an active role in ensuring that the private sector is a key partner in the development of future infrastructure projects, while adhering to the goals of reflecting investment in its core sectors – green infrastructure, clean power, public transit, trade and transportation and enhanced broadband infrastructure. In order to ensure this happens, the government must guarantee that the Canada Infrastructure Bank is adequately funded in the long-run.

We look forward to working with you to further develop these recommendations. If you have any additional questions, please contact Stuart Atkinson, OSPE Policy and Government Relations Lead, at satkinson@ospe.on.ca or 416-223-9961 ext. 225.

Sincerely,

Mark Frayne, P.Eng.
President & Chair
Ontario Society of Professional Engineers

Sandro Perruzza
Chief Executive Officer
Ontario Society of Professional Engineers