
2011 Pre-budget Submission to the House Standing Committee on Finance

Building a Better Future

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**Engineers Canada is the business name of the Canadian Council of Professional Engineers, the national organization of the 12 provincial and territorial associations that regulate the profession of engineering in Canada and license the country's more than 234,000 members of the engineering profession.*



Executive Summary

Engineers Canada is the national organization of the 12 provincial and territorial associations that regulate the profession of engineering in Canada and license the country's more than 234,000 members of the engineering profession.

We promote and facilitate high academic, professional and ethical engineering standards across the country. As professionals, engineers are obligated to work in the public interest in an accountable and transparent manner. Professional engineers are also committed to being active participants in the development of public policy in the interest of helping to protect the health, safety and quality of life of Canadians.

Our recommendations focus on ensuring that Canada's infrastructure is up for the challenges of a dynamic and prosperous future.

- The federal government must work with provinces, municipalities and other stakeholders to ensure that the long-term infrastructure strategy the federal government is intending to develop is sustainable.
- The federal government must work with infrastructure owners and stakeholders to ensure that Canada's infrastructure can adapt to a changing environment as a result of climate change by maintaining a national network of climate change and watershed data.
- The federal government should adjust research and develop funding programs to make them more strategic and open to commercialization.

Introduction

Engineering helps protect over 34 million Canadians every day and engineers contribute to the economic prosperity and quality of life of Canadians in their communities.

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Engineers Canada believes that sustainable and well-planned infrastructure that can withstand the demands of our evolving climate helps to create the Canada we all deserve – prosperous, innovative and secure. The recommendations in this submission are focussed on improving Canada's infrastructure in the face of underinvestment and external threats like changing weather patterns in order to support a robust and innovative economy, now and in the future.

Recommendations

- 1) ***The government must work with provinces, municipalities and other stakeholders to ensure that the long-term infrastructure strategy the government is intending to develop is sustainable.***

Engineers Canada was pleased with the federal government's recent commitment to improving Canada's infrastructure, as presented in *The Next Phase of Canada's Economic Action Plan: A Low-Tax Plan for Jobs and Growth* and look forward to working with governments and other stakeholders to advance a sustainable approach to improving Canada's infrastructure.ⁱ

However, we continue to be concerned about the state of Canada's infrastructure because it directly affects Canadians' economic prosperity, health and safety. Canada's highways, water systems, sewers and bridges are vital to our quality of life. There continue to be serious signs that our public infrastructure is deteriorating rapidly. Several recent incidents have reinforced the ongoing need to repair and rehabilitate our existing infrastructure and to build new infrastructure. A sustainable and planned approach to the needed investments is required by all orders of government.

Ensuring that infrastructure decisions are based on full life cycle analysis and comprehensive needs assessment can save taxpayer dollars over time, avoid excessive costs of emergency rehabilitation, help to ensure the timely implementation of regulations required to protect the health and safety of Canadians in their communities, and attract individuals and investment to a country that can pride itself on having economically, environmentally and socially sustainable infrastructure. Ultimately, if we don't begin to address our infrastructure needs strategically in the near future, the costs of protecting Canadians will increase.ⁱⁱ

A unified approach on how owners and managers of infrastructure assess the condition and performance of the assets and services they provide can save money over time – as well as lives. Such approaches include ensuring there is accurate information on the state of infrastructure, and a consistent set of indicators and processes. More accurate costing can be achieved where technical performance measures, such as the condition and performance of assets, are combined with social, economic, environmental and safety considerations.ⁱⁱⁱ

In order to ensure that the government is getting the best possible information, Engineers Canada is looking forward to working with other infrastructure stakeholders over the coming months to gather information on best practices and develop advice on how future government programs can contribute to a long-term, sustainable infrastructure strategy for Canada after the expiry of the Building Canada plan in 2014. We strongly believe that by working with other orders of government and informed stakeholders, both bilaterally and multilaterally, the federal government can make certain that infrastructure funding and planning is done in a strategic and cost-effective manner.

2) *The federal government must work with infrastructure owners and stakeholders to ensure that Canada's infrastructure can adapt to a changing environment as a result of climate change and extreme weather events.*

The federal government has a valuable role to play to enable Canada's infrastructure to adapt to a changing environment as a result of climate change by maintaining the national network of climate change and watershed data. The federal government can show leadership, and find efficiencies by establishing cooperative agreements to secure additional data from provincial, territorial and municipal authorities that maintain their own networks, as well.

Changing weather patterns continue to affect the way Canadians live. Increases in extreme weather events are resulting in disruptions in economic activity, reduced serviceable life spans for public infrastructure, greater maintenance costs, and risks to public safety. Engineers Canada maintains that engineers have a responsibility to prevent or minimize such disruptions and reduce risks by designing, building and maintaining resilient infrastructure that can adapt to the impacts of a changing climate.

Although the federal government recently announced investments to support a suite of programs aimed at helping Canadians adapt to a changing climate, the *2011–12 Main Estimates for Environment Canada* includes a series of program and spending changes to climate change and weather services that could compromise the integrity of climate change data collection. These cuts may impact the public safety and economic viability of built infrastructure in Canada. While we do appreciate the unprecedented fiscal challenges faced by the government given the current deficit and the goal of financial recovery by 2015, engineers rely heavily on data collected by the federal government for safe and cost-effective infrastructure design, operation and maintenance.

In the past, historical records were sufficient for engineering design, but increased weather variability and unpredictability makes up-to-date information vital for the modernization of existing infrastructure and the design and construction of new infrastructure. There is also a growing need to project climate into the future. Investment decisions for infrastructure which should have a service life of anywhere from 25 to 100 years or more requires better definition of future climate parameters. These parameters are used in the design and operation of

infrastructure through our national and provincial and territorial codes, standards, and related instruments.

Along with investments and planning to address the ongoing infrastructure deficit in Canada, specific tools and information are required to assist infrastructure owners in assessing how their assets will perform during extreme weather events. As an example, the PIEVC Engineering Protocol provides municipalities with a tool to assess the vulnerability of their infrastructure to extreme weather events and changing climate at a reasonable cost. For example, the City of Calgary recently completed a vulnerability assessment of their potable water supply system which is valued at hundreds of millions of dollars for a cost of \$100 000. The information from this assessment is being used to implement cost-effective measures to increase the resiliency and reliability of this system to climate impacts.

The federal government has a valuable role to play in ensuring that national climate change and watershed data are available and that the modeling, analysis and scientific interpretation needed to translate this information into useful applications for engineers and others remains scientifically defensible.

3) *The federal government should adjust research and development funding programs to make them more strategically targeted and open to commercialization.*

Engineers Canada welcomes the federal government's commitment to research and development and innovation, and has participated in both the consultation on the digital economy and the work of the Expert Review Panel on Research and Development. The *2011 Speech from the Throne* notes that the government will "look for ways to support innovation while ensuring that federal investment in research and development is effective and maximizes results for Canadians". The two previous recommendations regarding reliable infrastructure will help to attract both talent and investment to Canada. Additional adjustments to research and development spending will also help put Canada on the leading edge of innovation.^{iv}

Given that a key role of government in fostering research and development is "providing appropriate support for business and commercially oriented R&D", it follows that government also has a role to play, with the private sector and academia, in identifying and directing funding to potentially high value activities in areas of known research and development strengths. However, any strategic plan would have to ensure that the delivery of financial support continue to be an open and transparent process.^v

Engineers Canada recommends that the requirements to qualify for grants and incentives be reviewed to ensure that they do not include elements that may inhibit commercialization, including removing barriers to securing intellectual property ownership of research, design, and developments outputs,

Federal government support for research and development and innovation helps to ensure funds are available to support the procurement and retention of talent and to reinforce the position of Canada as a good place to invest. A robust research and development program also needs reliable, well-planned and adequately funded infrastructure over the long-term to attract investment and talent.^{vi}

Conclusion

The federal government can attract businesses, create jobs, and improve Canada's reputation on the world stage—and further ensure Canadians' economic and social well-being—by investing in well-planned infrastructure, helping communities manage a changing climate, and supporting research and development.

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ⁱ “Going forward, the Government will work with provinces, territories, the Federation of Canadian Municipalities and other stakeholders to develop a long-term plan for public infrastructure that extends beyond the expiry of the Building Canada plan”, The Next Phase of Canada's Economic Action Plan: A Low-Tax Plan for Jobs and Growth, Federal Budget 2011.

ⁱⁱ An Asset Management Governance Framework for Canada, National Asset Management Working Group., February 2009.

ⁱⁱⁱ Model Framework for Assessment of State, Performance and Management of Canada's Core Public Infrastructure, National Roundtable on Sustainable Infrastructure, May 2009.

^{iv} Speech from the Throne. June 3, 2011

^v Review of Federal Support to Research and Development, Expert Panel Consultation Paper, October, 2010

^{vi} Putting the Pieces Together: A response to review of federal support to research and development, Engineers Canada, February 2011.