



## **Submission to House of Commons Standing Committee on Finance**

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## **About Engineers Canada**

Engineers Canada is the national organization of provincial and territorial associations that regulate the practice of engineering in Canada and license the country's more than 270,000 members of the engineering profession. Together, we work to advance the profession in the public interest.

The Canadian public needs to know that only qualified individuals perform engineering work. Regulators work in the public interest by ensuring that those who practice have the right education, knowledge, skills and experience. Engineers make the conscious choice to be held publicly accountable for their work.

Engineering drives much of Canada's economy. Natural resource, manufacturing, technology and other sectors rely upon the expertise of engineers. In particular, the success of Canada's investments in infrastructure relies on engineers for planning, design, operations, maintenance, rehabilitation, and decommissioning. Engineers assure present and future risks have been appropriately assessed.

As one of the top five exporters of engineering services in the world, the expertise and skill of Canada's engineers contributes to Canada's and the global economy. Engineers work tirelessly in Canada and abroad to keep the public safe and to contribute to strong, prosperous communities.

## **Executive Summary**

To build a stronger, safer and more prosperous country, Engineers Canada recommends that the federal government make public interest investments in:

- infrastructure risk assessments and resilience, and
- measures to support the availability and use of engineering expertise.

### ***Infrastructure Risk Assessments and Resilience***

To build and sustain safe and prosperous communities, Engineers Canada recommends that the federal government allocate a minimum of \$4 million over two years for infrastructure owners – such as municipalities – to undertake infrastructure risk assessments. These assessments will help ensure their communities are better able to withstand extreme weather events or other service disruptions.

In addition, the federal government should review existing infrastructure funding programs to confirm that funded core public infrastructure projects include infrastructure risk assessments and the consideration of adaptive measures. This will help ensure that taxpayers are receiving long-term value for infrastructure investments made by government.

Incorporating risk assessment more fully into infrastructure planning can preserve life and property in an unpredictable environment.

## ***Availability and Use of Engineering Expertise***

Canada needs more licensed engineers with the skills required to drive key economic sectors and keep Canadians safe.

Engineers Canada recommends that the federal government invest in better labour market data collection so that employers, governments, employees, academia and prospective immigrants have a true picture of national and regional labour market needs and opportunities.

Furthermore, the federal government should extend the Canada Job Grant to include engineers, not only skilled trades. Engineering expertise is often required before skilled trades are needed to bring a project to life.

The federal government can show leadership by ensuring that only licensed engineers work in federal government jobs that involve engineering.

The engineering profession is committed to protecting the health and safety of Canadians. Engineering is an important part of Canada's economy. By supporting resilient infrastructure, and helping address the skills mismatch, the federal government can assist the engineering profession in contributing meaningfully to the public interest.

## **Recommendations**

### ***Infrastructure Risk Assessments and Resilience***

Nothing grinds a community to a halt as effectively as extreme weather, natural disasters or man-made service disruptions. The dependence of our health, safety, and prosperity on core public infrastructure increases the disruptive impact of any kind of unpredicted disaster. In particular, our changing climate is leading to an increase in weather events that result in flooding, extreme winds, tornados, record high and record low temperatures.

The costs of these unpredictable events are significant. For example, the cost of the damage in New Brunswick caused by Hurricane Arthur earlier this year is expected to exceed \$750,000. In 2013, flooding in Alberta led the federal government to spend \$2.8 billion in disaster relief and recovery. In 2011, Manitoba received \$100 million in support for damages sustained during floods. These are just three of many events that have put lives and property at risk across Canada.

Proactive solutions are required to mitigate the danger, damage and the costs of infrastructure vulnerability. One step to mitigating the impact of disruptive events is to understand the risks and introduce reasonable adaptations. Engineers Canada has developed an assessment protocol that assesses risk to infrastructure in the event of extreme weather. The Public Infrastructure Engineering Vulnerability Committee Protocol is one of a suite of available risk assessment tools that public infrastructure owners can use to understand their risks and adapt their infrastructure.<sup>i</sup>

### ***Recommendation***

Engineers Canada recommends that a minimum of \$4 million over two years be allocated to enable municipalities to build the capacity to incorporate risk assessments into their infrastructure planning.

A \$4 million investment will allow municipalities, and their engineers, to better protect the infrastructure investments that will be made using the \$47 billion in funding announced in 2013 as part of the new Building Canada Plan. A specific focus on core public infrastructure – roads, bridges, water and wastewater, sewers and storm sewers – should be considered.

By identifying the vulnerability of new and existing infrastructure to extreme weather events and service disruptions, communities will be better able to withstand the dangers to life and property they may face in the future.

### ***Recommendation***

Provinces, municipalities and non-governmental organizations applying for government funding to build or rehabilitate infrastructure should be required to demonstrate that they have assessed their infrastructure risks and taken reasonable measures to adapt in order to protect their communities.

It is particularly important to ensure that new infrastructure investments incorporate measures to enhance the resiliency of infrastructure. The taxpayer expects their community to withstand not only the rigours of daily use, but also unforeseen events including extreme weather or other service failures.

### ***Availability and Use of Engineering Expertise***

Engineers are qualified, educated, ethical and committed to serving the public interest. Engineers contribute to all parts of our society. The diversity of disciplines shows how pervasive engineering is in our modern life. Engineers and engineering drive key industrial sectors in Canada – natural resources, manufacturing, technology and infrastructure are but a few.

Employers want and need engineers, particularly engineers with over 10 years' experience. They want engineers with the specialized skills that are acquired by working in a specific discipline for an extended time. Even with over 70,000 undergraduate students in accredited engineering programs across Canada, we still need more engineers. Between now and 2020, approximately 95,000 engineers could fully or partially retire, and an estimated 16,000 new engineering jobs will be created.<sup>ii</sup>

Engineering graduates are excited about their profession and their future, but they are looking for a specific employer. They want to work in a dynamic environment. They want an employer who will invest in them, so they can invest in their work and the goals of the company. According to Engineers Canada's most recent exit survey of fourth-year Bachelor of Engineering students, 95 percent of students say they are likely to pursue a career in engineering. Two-thirds definitely will while three in ten probably will.<sup>iii</sup>

Unfortunately, engineers and employers are struggling to get on the same page. This has the effect of creating shortages in key industries in various regions across Canada.

Engineers Canada believes that better understanding the engineering labour market and encouraging employers to invest in their human resources requires a concerted and coordinated effort between government, employers, professions, and academia.

### ***Recommendation***

Labour market information must to be made available to employers, governments, employees, academia and prospective immigrants to make sure that the right engineering expertise is available when and where it is needed most.

Engineers Canada regularly conducts an engineering labour market study. It is our view that a modest investment and creative partnering on the part of the federal government could lead to improved labour market data collection and analysis, so that businesses, governments, academia and individuals, including engineers, can make better decisions that will lead to prosperity.

### ***Recommendation***

Since the federal government announced the Canada Job Grant in March 2013, Engineers Canada has been supportive of the program's concept. Engineers Canada believes that the skills mismatch that exists can only be mitigated by coordinated action. However, to date, the Canada Job Grant has focused on skilled trades with little emphasis on the similar problem faced by the engineering profession. Engineering drives many of the industries that also rely on skilled trades. In fact, many of the industrial, extractive, manufacturing, and infrastructure-driven projects that will deliver economic growth over the next 10 years cannot mature to the point of needing skilled trades without the initial involvement of engineers.

The federal government relies on engineering knowledge and skills as much as the private sector in departments including Natural Resources Canada, Transport Canada, Public Safety Canada and Environment Canada. There is an opportunity for the federal government as an employer to lead the way by supporting training opportunities for new engineering graduates. Engineers Canada believes that the federal government must show leadership by ensuring that only licensed engineers work in federal government jobs that involve engineering.

### **Conclusion**

A safe, resilient, and prosperous country is a goal we can all agree on. Engineers are necessary contributors to that goal. Investing in the capacity to assess and adapt our community's risks in the face of a changing climate and unpredictable events, and leading municipalities, provinces and non-government infrastructure owners toward resilient infrastructure are in the public interest. Resolving the skills mismatch in the engineering profession will help drive Canada's economic growth, and keep the public safe.

Engineers Canada urges the federal government to address these issues now.

## Contact

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<sup>i</sup> Engineers Canada established the Public Infrastructure Engineering Vulnerability Committee (PIEVC) in August 2005 in partnership with Natural Resources Canada to assess the vulnerability of Canada's public infrastructure to climate change. The PIEVC consists of representatives from all three levels of government in Canada as well as important national organizations that represent municipalities, insurance, codes and standards and research organizations engaged in climate change impacts and adaptation.

Three phases of financial contribution from NRCan supported this work from August 2005 to March 2012. Close to 2.5 million dollars of financial contribution was provided by Natural Resources Canada between 2005 and 2012. More than 3.5 million dollars in external financial and in-kind contributions were secured by Engineers Canada in the same period.

For more information, please see [http://www.pievc.ca/e/index\\_.cfm](http://www.pievc.ca/e/index_.cfm)

<sup>ii</sup> Engineers Canada, "The Engineering Labour Market in Canada: Projections to 2020". October, 2012.  
<http://www.engineerscanada.ca/labour-market-report>

<sup>iii</sup> Engineers Canada, "2014 National Final Year Engineering Student Survey - National Report". April, 2014.  
<http://www.engineerscanada.ca/final-year-student-exit-report>