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# THE ROLE OF ENGINEERS IN BUILDING A SAFE AND RESILIENT CANADA

## THE ENGINEERING PROFESSION'S POSITION

- Public safety is threatened, and environmental, social, and economic interests are not adequately protected, when professional engineers are not directly involved in Canadian infrastructure initiatives that require the application of engineering expertise.
- Professional engineers play a pivotal role in building safe and resilient communities across Canada in their day-to-day work as they apply technology in creative ways for the benefit of society.
- Professional engineers assess, manage, and monitor risks, support economic stability, establish priorities, identify problems and leverage opportunities that proactively and creatively build a safe and resilient Canada.
- Incorporating professional engineers' accountability into federal legislation and regulation weaves the engineering regulatory process into the fabric of government and keeps Canadians safe. Engineering expertise is critical to building and rebuilding of a safe and resilient Canada.

## The challenge(s)

A safe and resilient Canada is one that can effectively prepare, prevent, respond, and recover from shocks and stressors, and to prosper thereafter. The International Federation of the Red Cross (IFRC)[1] outlined several qualities that promote resilience. They include:

- The ability to assess, manage, and monitor risks.
- The capacity to provide a range of diverse economic opportunities to support economic stability, sustainable infrastructure, and services—including housing, transportation systems, power, water, and sanitation systems.
- The capacity to identify problems, establish priorities, and act proactively to address them when they arise.
- The capacity to connect.

These qualities recognize the importance of human health and well-being; undoubtedly placing human needs as the highest parameter in the planning, design, and operation of technical systems. Professional engineers play an important role in building safe and resilient communities across Canada in their day-to-day work as they apply technology in creative ways for the benefit of society. Public health and safety are threatened when professional engineers are not directly involved in the planning, design, implementation, review, and maintenance of projects and initiatives that require the application of engineering principles. Professional engineers strengthen the safety and resiliency of communities across Canada by providing innovative solutions to proactively address complex problems, protect federal, provincial, and territorial assets, connect communities, and drive national economic recovery, all while managing risks.

Professional engineers have continuously proven their ability to build and maintain a safe and resilient Canada across federal jurisdictions. Some examples include designing personal protective equipment during the COVID-19 pandemic to

[1] International Federation of Red Cross and Red Crescent Societies. (2011). "Characteristics of a Safe and Resilient Community. Community Based Disaster Risk Reduction Study." Retrieved October 8, 2021, from: https://preparecenter.org/wp-content/sites/default/files/final_characteristics_report.pdf

mitigate public health risks; providing unbiased climate adaptation and mitigation expertise to safeguard public infrastructure; connecting communities through sustainable broadband technology; collaborating with Indigenous leaders to strengthen infrastructure within First Nations communities; enhancing innovation and productivity across Canada by supporting diversity, equity, and inclusion practices within the profession; strengthening national cybersecurity from unauthorized access or attacks that are aimed for exploitation; and supporting the development of artificial intelligence engineering technology in autonomous and connected vehicles.

## How Engineers Canada has contributed

Engineers Canada understands the importance of actively engaging with the federal government on initiatives that impact the work that professional engineers do and that include activities that could involve engineering work. We have built strong and open working relationships with the federal government, both with parliamentarians and senior federal officials.

In collaboration with the 12 provincial and territorial engineering regulators, Engineers Canada has contributed unbiased expertise to strengthen the safety and resiliency of communities across Canada. Initiatives include:

- Developing National Position Statements that highlight the engineering profession's position on key issues relating to the public interest.
- Contributing to federal initiatives by providing evidence-based recommendations to the federal government.
- Developing national guidelines and papers that serve the needs of regulators, engineers, and applicants for licensure.
- Maintaining accreditation standards within Canadian undergraduate programs in engineering, which safeguard the public with consistent academic requirements for licensure and service.
- Strengthening public safety through equity, diversity, and inclusion practices, specifically through Engineers Canada's 30 by 30 initiative, that promote innovative thinking to solve complex societal problems.

## Recommendation to the federal government

The federal government's willingness to coordinate and collaborate with the engineering profession is essential in ensuring a safe and resilient Canada. Professional engineers possess the skills and knowledge to respond and advise the federal government on current and future challenges. The application of engineering principles and expertise spans across every federal department, from providing insight to strengthen Canada's innovative output, protecting structural integrity of physical infrastructure, protecting the natural environment, strengthening diversity and inclusion initiatives, providing input for national educational initiatives and programming, and protecting the national economy. Engineering expertise is essential in supporting federal projects and initiatives that protect and strengthen Canadian communities.

The federal government should:

- Ensure that any legislation or regulations that refer to engineering work require the involvement of a professional engineer, licensed in accordance with provincial and territorial engineering acts.
- Adopt a government-wide policy to ensure that engineering work is performed by individuals who are licensed to do so, thereby

encouraging compliance with professional regulatory legislation that holds those so licensed professionally accountable for their engineering work.

## How Engineers Canada will contribute

Engineers Canada will continue to:

- Monitor the government agenda, legislative initiatives, and proposed regulations and activities to bring recommendations forward to the federal government regarding the need for professional engineers to be legally required where engineering expertise is required.
- Advocate for decision-makers to ensure that federal legislation, initiatives, and regulations retain explicit references to the inclusion of engineers licensed with provincial and territorial regulators, in the interest of public safety across Canada.
- Continue to ensure that Canadian engineering accreditation standards developed through Engineers Canada, which mandate the standards for the education of Canadian-trained engineers, include the most current engineering expertise, especially that which addresses the safety and resilience of Canadian infrastructure.
- Provide input from engineers on federal initiatives, legislation, and regulations where engineering work is in the public interest.
- Support the work of the engineering regulators to enforce the provincial and territorial engineering acts as they pertain to the practice of engineering disciplines impacting the safety and resiliency of communities in Canada.