

Engineers Canada's Submission to the House of Commons Standing Committee on Transport, Infrastructure and Communities on the Canadian Transportation and Logistics Strategy

Questions concerning the content of this report should be directed to:

Joey Taylor
Manager, Public Affairs
Engineers Canada
joey.taylor@engineerscanada.ca
613.232.2474 Ext. 213

Overview

The transportation sector is vital to Canada's overall economy. The current transportation system enables Canadian goods, services, products, and people to access key national and global markets, creating prosperity and economic opportunities for all Canadians. In 2016, the transportation sector represented approximately 4.5 per cent of Canada's total Gross Domestic Product (GDP)¹ and employed approximately 897,000 individuals across Canada.²

Canada's transportation system must remain modern, innovative, safe, and efficient to build a strong economy and to improve the quality of life for Canadian citizens. For this reason, the House of Commons Standing Committee on Transport, Infrastructure and Communities is seeking the views of Canadians regarding the scope of the modernization of Canada's current transportation system; specifically, regarding the Government of Canada's transportation and logistics strategy entitled "*Transportation 2030: A Strategic Plan for the Future of Transportation in Canada.*"

Through the *Transportation 2030 Strategic Plan*, the Government of Canada is working to strengthen the transportation sector to create a safe, innovative, sustainable, and unified transportation system across Canada that will continue to support economic growth, public safety, and the natural environment. The plan is based on five themes that revolve around the traveller: safer transportation; green and innovative transportation; waterways, coasts and the north; and trade corridors to global markets. Several federal initiatives are now underway to support these priorities, such as the continued collaboration with provinces and territories to support the Pan-Canadian Framework on Clean Growth and Climate Change.³

In Canada, individuals performing engineering work must hold an engineering licence from the provincial or territorial regulator in the jurisdiction in which the work is being performed. These professional engineers are the only ones who are legally allowed to use the term engineer; an 'engineer' and a 'professional engineer' are one and the same. This licensing process ensures that applicants meet requirements in academics, work experience, language, good character, and professionalism and ethics, and that engineers are held accountable for their work not only by the engineering regulator, but also by their employers.

Engineers Canada understands the need to balance both economic activities with environmental stewardship in Canada's transportation sector. Engineers across Canada work to achieve this balance every day; all while upholding public safety. For this reason, Engineers Canada strongly believes that the engineering profession must be involved in the development and modernization of the Government of Canada's *Transportation 2030 Strategic Plan*.

¹ Statistics Canada (2017). "Transportation 2030: A Strategic Plan for the Future of Transportation in Canada." Retrieved June 26, 2018 from: <https://www150.statcan.gc.ca/n1/pub/11-402-x/2011000/chap/trans/trans-eng.htm>

² Government of Canada (2017). "Transport Canada: Transportation in Canada 2016." Retrieved June 27, 2018 from: <https://www.tc.gc.ca/eng/policy/transportation-canada-2016.html#report-highlights>

³ Government of Canada (2016). "Pan-Canadian Framework on Clean Growth and Climate Change: Canada's Plan to Address Climate Change and Grow the Economy." Retrieved June 29, 2018 from: http://publications.gc.ca/collections/collection_2017/eccc/En4-294-2016-eng.pdf.

Given the unique perspective of engineers in Canada, Engineers Canada recommends the following to strengthen the Government of Canada's *Transportation 2030 Strategic Plan*:

- that the "Trade Corridors to Global Markets" theme be expanded to include consultation with engineers in Canada
- that the "Trade Corridors to Global Markets" theme incorporate climate vulnerability and resilience objectives
- that section 4.1 of the Pan-Canadian Framework on Clean Growth and Climate Change be expanded to include consultations with engineers in Canada
- that section 4.1 of the Pan-Canadian Framework on Clean Growth and Climate Change be expanded to include the collection of national climate data

Transportation 2030 Strategic Plan

In 2016, the Government of Canada consulted with Canadians about the current transportation system; specifically, on how to maximize economic opportunities, improve trade, compete globally, and improve the efficiency of supply chains. To meet these desired goals, and as part of the \$81-billion investment in infrastructure, the Government of Canada committed to analyzing new ways of collecting data and increasing the movement of goods and people over the next 11 years.⁴

Although this investment is a great first step towards ensuring a safer and more innovative transportation system, Engineers Canada strongly believes that there is a need to improve Canada's transportation system in a manner that further enhances accountability, credibility, transparency, and the participation of engineers in Canada.

Recommendation #1: That the "Trade Corridors to Global Markets" theme be expanded to include consultation with engineers in Canada

The fifth theme of the *Transportation 2030 Strategic Plan*, entitled "Trade Corridors to Global Markets," focuses on improving the performance of Canada's transportation systems to get products to market and grow Canada's economy. The Government of Canada's goal for this theme is to invest \$10.1 billion for transportation infrastructure to support robust trade corridors and to address existing transportation delays.

The majority of Canada's infrastructure, specifically transportation infrastructure, requires significant investments now and in the future. According to the 2016 Canadian Infrastructure Report Card, one third of Canada's municipal infrastructure is in fair, poor, or very poor condition; increasing the risk of service disruptions, bottlenecks, and threats to public safety.⁵

Bottlenecks and service disruptions in Canada's transportation system are more serious than in other sectors. Some bottlenecks are easy to address whereas others may require intensive resolution strategies,

⁴ Government of Canada (2018). "Transportation 2030: Trade Corridors to Global Markets." Retrieved July 3, 2018 from: <https://www.tc.gc.ca/eng/future-transportation-canada-trade-corridors-global-markets.html>.

⁵ The Canadian Infrastructure Report Card (2016). "Canadian Infrastructure Report Card: Informing the Future." Retrieved July 3, 2018 from: http://canadianinfrastructure.ca/downloads/Canadian_Infrastructure_Report_2016.pdf.

such as replacing or upgrading equipment or reconsidering process design and operations. For example, Alberta grain farmers have been calling for significant resolutions to bottlenecks in rail transportation systems that have negatively impacted reliable grain distribution across Canada. Extreme winter conditions, coupled with rail bottlenecks in Alberta, have caused grain handlers to pay penalties for delivering grain late and have negatively impacted rural grain farmers' ability to sell as much as they did in previous years. Alberta's rail bottlenecks are severe for grain farmers and distributors. Canada's "commodity producers are getting left behind as other nations take advantage of a recent run up in global prices."⁶

Engineers Canada strongly believes that to improve trade and the efficiency of supply chains, engineers must be consulted and included in decisions requiring engineering work. Engineers consider the design of transportation infrastructure as well as process operations; all while upholding public safety. They look beyond the service disruption or bottleneck to evaluate the full operating system, analyzing the scope and depth of the delay to understand viable alternatives and possible solutions for infrastructure owners.⁷ A transportation system may be well-designed, yet it may still be vulnerable to external factors that compromise "its reliability, consistency, and overall performance."⁸

By consulting and collaborating with engineers, bottlenecks and service delays within Canada's transportation system can be properly addressed and monitored; allowing for commodity producers across the country to remain competitive, for transportation systems to be improved to better serve Canadians, and for Canada's economy to remain competitive. For this reason, Engineers Canada strongly believes that the perspectives of engineers must be considered by the federal government.

Recommendation #2: That the "Trade Corridors to Global Markets" theme incorporate climate vulnerability and resilience objectives

Resilient infrastructure is required to support productive societies, stable sectors, and increased public confidence in transportation infrastructure. Extreme weather on vulnerable transportation infrastructure can have devastating and immediate effects on communities, crucial sectors of the global supply chain, and public safety. Without the consistent application of climate vulnerability assessments to inform transportation infrastructure across Canada, public confidence and trust towards transportation infrastructure could become fragile.

On May 23, 2017, damaging floods and historic record water flows severely damaged Churchill, Manitoba's Hudson Bay Railway. This event severely damaged five bridges, washed away 19 sections of track bed, and caused 30 bridges and 600 culverts to be checked for structural integrity. This specific rail line was responsible for transporting food, supplies, and people to the remote northern community. This severe climate event caused major damages to the infrastructure of the Hudson Bay Railway, negatively impacted the efficiency of the supply chain, and negatively impacted public trust in rail infrastructure. The catastrophic damage to the rail line took months to repair; causing major service disruptions to both individual and business productivity.

⁶ Financial Post (2018). "Canadian rail crunch leaving oil, grain stranded, crushing crude prices and farmers' pocketbooks." Retrieved July 4, 2018 from: <https://business.financialpost.com/commodities/energy/fort-hills-last-of-the-major-oilsands-projects-starts-amid-pipeline-and-rail-constraints>.

⁷ Polaris (2014). "Strategies Process Engineers Use to Remove Bottlenecks." Retrieved July 4, 2018 from: <http://www.polarisengr.com/engineering/strategies-process-engineers-use-remove-bottlenecks/>.

⁸ *IBID.*

To promote public confidence in the government's *Transportation 2030 Strategic Plan*, and to mitigate the impact of extreme weather events on public infrastructure, a comprehensive and planning-based approach to climate vulnerability and risk assessments is required; specifically, under the "Trade Corridors to Global Markets" theme. With the government's transition from an environmental assessment regime to an impact assessment regime, decisions must have accountability attached to them and assessment criteria must be clearly outlined. The *Transportation 2030 Strategic Plan* must be expanded to ensure that project approvals related to transportation infrastructure in Canada are based on their ability to support Canada's climate target while simultaneously upholding public safety.

It is Engineers Canada's view that considerations related to climate vulnerability and transportation infrastructure assessments be expanded under the *Transportation 2030 Strategic Plan*. Engineers Canada's Public Infrastructure Engineering Vulnerability Committee (PIEVC) Protocol systematically reviews historical climate information and projects the nature, severity, and probability of future climate changes and events. It also establishes the adaptive capacity of an individual infrastructure project as determined by its design, operation, and maintenance. It includes an estimate of the severity of climate impacts on the components of the infrastructure to enable the identification of higher risk components and the nature of the threat from the climate change impact.

This information can be used to make informed engineering decisions on what components require adaptation as well as how to adapt them; specifically, through design adjustments or changes to operational or maintenance procedures. The Protocol has been used 45 times across Canada and twice internationally.

The Government of Canada announced in June 2018 that as part of the *Investing in Canada Plan*, new major infrastructure projects that are seeking federal funding will be required to undertake an assessment of how their projects will contribute to or reduce carbon pollution, and to consider climate change risks in the location, design, and planned operation of an infrastructure project. The Climate Lens lists the PIEVC Protocol as one of the methodologies for assessing climate change resilience that is consistent with ISO 31000.

While this investment is an important first step, Engineers Canada encourages the federal government, specifically through the *Transportation 2030 Strategic Plan*, to include climate vulnerability processes, such as the PIEVC Protocol, to support productive societies, stable sectors, and increased public confidence in transportation infrastructure.

Pan-Canadian Framework on Clean Growth and Climate Change

Several initiatives have been put into place by the Government of Canada as part of its *Transportation 2030 Strategic Plan* to support a "safe, secure, green, innovative and integrated transportation system that enables trade and economic growth, a cleaner environment and the well-being of Canada's middle

class...”⁹ Some of these initiatives include the Oceans Protection Plan, the Trade and Transportation Corridors Initiative, and the Pan-Canadian Framework on Clean Growth and Climate Change. The focus of this submission from Engineers Canada is recommendations on expanding the Pan-Canadian Framework on Clean Growth and Climate Change to further support the *Transportation 2030 Strategic Plan*.

The disruption and cost to Canada’s economy when infrastructure is damaged or destroyed by extreme weather events is growing and becoming more frequent across Canada. The international community has articulated that addressing climate change is an urgent priority and an opportunity to transition to a global low-carbon economy. The Pan-Canadian Framework on Clean Growth and Climate Change works to achieve Canada’s international commitments on climate change, while supporting initiatives for a more prosperous economy for future generations.

Recommendation #3: That section 4.1 of the Pan-Canadian Framework on Clean Growth and Climate Change be expanded to include consultations with engineers in Canada

Section 4.1 of the Pan-Canadian Framework on Clean Growth and Climate Change focuses on taking steps towards adapting core infrastructure to current and future climate impacts; specifically, with a focus on collaborating with stakeholders to build regional expertise and capacity for adaptation that is guided by scientific and Traditional Knowledge.

The Pan-Canadian Framework on Clean Growth and Climate Change will have a tremendous impact on major projects in Canada, both in the short and long term. It is Engineers Canada’s view that individuals performing assessments for designated projects under section 4.1 of the Framework must do so with high levels of technical skills and ethics and that they are held professionally accountable for their actions. Translating knowledge and expertise into action requires resources as well as skilled, professional, and unbiased individuals.

In Canada, engineering is regulated under provincial and territorial law by the 12 provincial and territorial engineering regulators. The 12 engineering regulators are entrusted with holding individual engineers professionally accountable for practising in a professional, ethical, and competent manner and in compliance with the applicable provincial or territorial engineering act, code of ethics, or legal framework. The first detailed item of the code of ethics delineates that licensees must hold paramount the safety, health, and welfare of the Canadian public and the protection of the environment. Technical and professional standards of conduct are set, revised, maintained, and enforced by the regulators for all professional engineers under their jurisdiction.

By designating that only licensed individuals undertake assessments of engineering work under section 4.1 of the Framework, the federal government can provide assurance to the public that decisions will be made appropriately, and that evidence collected is unbiased and in the public interest. These levels of accountability will provide the best risk management process going forward to adapt Canada’s transportation infrastructure to changing climate.

Engineers Canada therefore recommends that section 4.1 of the Pan-Canadian Framework on Clean Growth and Climate Change be expanded to include consultations with engineers. Experienced

⁹ Transport Canada (2018). “2017-2020 Departmental Sustainable Development Strategy.” Retrieved July 6, 2018 from: <https://www.tc.gc.ca/eng/2017-2020-departmental-sustainable-development-strategy.html>.

engineering professionals are available to provide technical expertise and impartial advice to governments on adaptation and mitigation requirements, and to advise on and help develop sound policies, appropriate processes, and feasible technical implementation strategies.

Recommendation #4: That section 4.1 of the Pan-Canadian Framework on Clean Growth and Climate Change be expanded to include the collection of national climate data

The Pan-Canadian Framework on Clean Growth and Climate Change, specifically section 4.1, stresses the importance of gaining authoritative science and information to truly understand climate changes in Canada. One goal under the Pan-Canadian Framework on Clean Growth and Climate Change is to establish a Canadian centre for climate services to improve access to climate data, information, and services. To support this endeavour, Engineers Canada encourages the government to invest in national climate data collection.

The collection of national climate data must remain up-to-date, consistent, reliable, and accurate to increase public confidence in federal environmental assessments and regulatory processes, while simultaneously supporting evidence-based information to guide project planning activities. Consistent national climate data will ensure that accurate climate projections are made, enabling effective planning for both present and future projects.

Who we are:

Engineers Canada is the national organization of the 12 provincial and territorial associations that regulate the practice of engineering in Canada and license the country's 290,000 engineers. Together, we work to advance the profession in the public interest.

Engineers drive much of Canada's economy. Natural resources, manufacturing, transportation infrastructure, technology, and other sectors rely on the capability of engineers. As one of the top five exporters of engineering services in the world, the expertise of Canada's engineers contributes to both the Canadian and international economy.