



# Engineers Canada's submission to the House of Commons Standing Committee on Indigenous and Northern Affairs

## Study on community capacity building and retention of talent

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## Overview

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The House of Commons Standing Committee on Indigenous and Northern Affairs is conducting a study on community capacity building and the retention of talent in Indigenous communities across Canada. Capacity building is a process where individuals, groups, organizations, and communities identify the obstacles that inhibit them from fully realizing their goals, while simultaneously enhancing their abilities to achieve measurable and sustainable results.<sup>1</sup> There has been a consistent effort made by the Government of Canada to encourage capacity building in Indigenous communities and to retain Indigenous talent in both key industries and Indigenous communities across the country.

One key initiative that the Government of Canada has created to support capacity building and the retention of Indigenous talent in Canada is the [Indigenous Community Development National Strategy](#), which serves to guide Indigenous Services Canada and Crown-Indigenous Relations and Northern Affairs Canada in building and investing in effective and sustainable Indigenous communities, government, and services.<sup>2</sup> This strategy will empower Indigenous communities across Canada to set objectives and to measure their own progress and performance towards attaining those objectives. The impact of government programs and policy on Indigenous communities must be acknowledged and a true collaborative nation-to-nation partnership will be pursued with this initiative. In supporting Indigenous Peoples and communities across Canada, the strategy will be flexible to meet unique and diverse regional needs.<sup>3</sup> At the core of this strategy is the principle of cultural diversity and respect for Indigenous knowledge; bringing the best practices in community development to assist in building a nationally sustainable model that serves all Indigenous Peoples in Canada.

Engineers Canada supports the Government of Canada's [Indigenous Community Development National Strategy](#), particularly the principle supporting cultural diversity and respect for Indigenous knowledge. Engineers Canada has taken several steps towards supporting cultural diversity and Indigenous knowledge within both engineering education and in the engineering profession. Engineers Canada remains committed to working collaboratively with Indigenous engineers and Indigenous students to find solutions to systematic problems that impact community capacity building and the retention of Indigenous talent in the profession. While this submission attempts to address community capacity building and retention of talent within Indigenous communities, it is important to highlight that the existing problems and root causes within Indigenous communities need to be addressed before significant changes can be made.

## Integrating Indigenous knowledge in the engineering profession

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The engineering profession has worked collaboratively with Indigenous communities and Indigenous leaders to strengthen Indigenous knowledge in engineering projects and climate resiliency assessments. Working together with the Ontario First Nations Technical Services Corporation (OFNTSC) and Stantec,

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<sup>1</sup> Government of Canada (2017). "Inclusion for All: A Canadian Roadmap to Social Cohesion Insights from Structured Conversations." Retrieved April 16, 2019 from <https://www.justice.gc.ca/eng/rp-pr/csj-sjc/jsp-sjp/tr01-rt01/p4.html>.

<sup>2</sup> Government of Canada (2019). "Indigenous Community Development National Strategy." Retrieved April 16, 2019 from: <https://www.sac-isc.gc.ca/eng/1550512330682/1550512404487>.

<sup>3</sup> Ibid.

Engineers Canada has released a new version of the Public Infrastructure Engineering Vulnerability Committee (PIEVC) Protocol that is tailored specifically for the unique requirements of First Nations communities. The 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 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 judgements on what components require adaptation as well as how to adapt them.

OFNTSC, Stantec, and Engineers Canada first began developing the First Nations PIEVC Protocol and Asset Management Toolkit when applying the PIEVC Protocol to the water and wastewater systems of the Mohawk Council of Akwesasne. It was discovered that elements of the PIEVC Protocol could be modified, refined, and made applicable to First Nations, which eventually led to the creation of the new toolkit, officially launched at the OFNTSC Ontario Water Conference on May 15, 2018.

The toolkit adapts the PIEVC Protocol to the unique characteristics of First Nations communities and infrastructure. For example, many First Nations communities are smaller than the municipalities that have previously used the PIEVC Protocol; they often work with a skeleton infrastructure and they may not have the climate data upon which the PIEVC Protocol relies. The toolkit also supports the inclusion of traditional knowledge to inform infrastructure projects within their communities. Integrating this knowledge with the PIEVC Protocol ultimately offers a far more complete picture of climate-related issues than could be obtained using data alone.

After developing this new version of the PIEVC Protocol with the Mohawk Council of Akwesasne—which also combined asset management concepts into one toolkit—it was then tested in two First Nations communities: Moose Cree First Nation of Moose Factory and the Oneida Nations of the Thames. Once the toolkit was tested, Engineers Canada supported further capacity building for Indigenous engineers and communities across Canada through risk assessment workshops and PIEVC Protocol training. The inclusion of traditional knowledge in an engineering framework has led to broader community involvement and a unique partnership that will ideally present new ways to improve models of the past.

Several post-secondary engineering programs across the country are exploring and developing ways to decolonize engineering education and curriculum. Engineers Canada has worked with members of the Canadian Engineering Education Association, our own Indigenous People’s Participation in Engineering working group, and specific institutions to facilitate collaboration and learning on integrating Indigenous knowledge, perspectives, and best practices for engagement with Indigenous communities. Engineers Canada sponsors the annual gathering of the Canadian region of the American Indian Science and Engineering Society (.caISES), where Indigenous engineers and Indigenous engineering students come together to create community and share knowledge. caISES works to provide support, mentorship, and networking opportunities for Indigenous peoples in science, technology, engineering, and mathematics (STEM) education.

## Retaining Indigenous people in the engineering profession

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There is a growing need to replace retiring engineers in Canada. Engineers Canada’s [Engineering Labour Market in Canada: Projections to 2025](#) report forecasts that as engineers retire and the economy continues to grow, more than 100,000 engineering job openings in Canada will be available between 2015

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and 2025. This requires that the engineering profession focus on attracting and retaining qualified and experienced workers with the necessary skills to support Canada's innovative capacity and global competitiveness. A crucial step in closing this skills gap is to focus on attracting and retaining qualified individuals into both post-secondary engineering education and the engineering profession.

However, although all Canadians should have the same opportunities to enter post-secondary engineering education programs and the engineering profession, accessibility and feasibility are not the same for all demographics, largely due to systemic barriers that disproportionately impact Indigenous populations in Canada. This has left Indigenous people in Canada severely underrepresented in both post-secondary engineering education and in the profession. Indigenous peoples make up more than 4.9 per cent of the Canadian population<sup>4</sup> but they accounted for only 1.2 per cent of total undergraduate enrolment and only 1.2 per cent of undergraduate engineering degrees were presented to Indigenous peoples in 2017.<sup>5</sup> The engineering profession in Canada can better understand, and therefore protect the public interest, if it is representative of the demographics that it serves. This means leveraging the best talent from all parts of society, which adds value to employers, increases the production of creative solutions, and provides a deeper understanding of clients' needs. Diversity is a key asset in innovation.

To retain Indigenous talent in the engineering profession, it is important to first attract Indigenous people to post-secondary engineering education. Considering this, numerous post-secondary institutions have made calls to decolonize education, including the University of British Columbia Okanagan, the University of Manitoba, the University of Windsor, the University of Saskatchewan, Queen's University, and the University of Regina, to name a few. Although the ethical imperative to promote Indigenous people's access to post-secondary engineering may be clear, what should also come to light is that diversity is key to achieving advances in engineering and applied science. When working towards a Canadian economy that is a worldwide leader in innovation, we must not forget that by investing in Indigenous people's access to engineering, we invest in our collective future.

The benefits of improving representation of Indigenous people and Indigenous ways of knowing in engineering are not limited to innovation. They include the creation of a positive voice for the profession in Indigenous communities, the support for Indigenous engineering role models and non-Indigenous allies, and they make for better project outcomes. This is then perpetuated in next generations, as young people know engineers and engineering, and may then be more likely to choose it as a career. Working with Indigenous communities on projects such as the First Nations PIEVC Protocol and Asset Management Toolkit, empowers communities to inform infrastructure projects within their communities.

Engineers Canada has committed to working with the federal government and other key partners to attract and retain Indigenous people in engineering. This is particularly true considering the [\*Truth and Reconciliation Commission's\*](#) findings and recommendations, namely the need to eliminate education and employment gaps between Indigenous people and non-Indigenous people; the recommendations to professional bodies requiring cultural competency and human rights training; and the value of meaningful consultation and ensuring equitable access to jobs, training, and education.<sup>6</sup>

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<sup>4</sup> Statistics Canada, 2018. Canada. Aboriginal Population Profile. 2016 Census. Statistics Canada Catalogue no. 98-510X2016001. Ottawa. Released July 18, 2018

<sup>5</sup> Engineers Canada, 2017. Enrolment and degrees awarded report 2013-2017.

<https://engineerscanada.ca/publications/canadian-engineers-for-tomorrow-2017>

<sup>6</sup> The Truth and Reconciliation Commission of Canada (2015a). Calls to Action. Winnipeg, MB.

Engineers Canada is dedicated to working with Indigenous engineers and post-secondary institutions to facilitate attracting and retaining Indigenous people in post-secondary engineering education programs across Canada. Engineers Canada created the *Indigenous people's access to post-secondary engineering programs: A review of practice consensus*, which supports the development of engineering access programs for Indigenous people across Canada. The report was published in 2016 and provides recommendations for activities that program managers in Canadian post-secondary engineering programs can use to evaluate best practices. Engineers Canada has worked to identify programs that increase Indigenous people's access to engineering and is working towards the expansion of these programs to raise the profile, as well as improve the image, of the engineering profession in Indigenous communities. According to Engineers Canada's Enrolment and Degrees Awarded data from 2013-2017, approximately only 1.2 per cent of students in undergraduate engineering programs in Canada identify as Indigenous.

Engineers Canada's Indigenous People's Participation in Engineering Working Group, which is part of the Equitable Participation in Engineering Committee, is working with the engineering regulators to develop a national strategy to increase Indigenous people's participation in engineering, with a focus on increasing the number of Indigenous people graduating from engineering undergraduate programs across the country.

The working group has formed a relationship with the American Indian Science and Engineering Society (AISES), which works to support Canadian Indigenous students. AISES and the working group identified the need to have Canadian representation in their decision-making to help AISES serve Canadian members more fully, and the Canadian Indigenous Advisory Council (CIAC) to AISES was created in September 2017. CIAC provides guidance to AISES and supported the establishment of the new Canadian equivalent region of AISES, which is known as .caISES (mentioned above).

To better serve Canadian society at large, as well as the economy, the federal government must work to support the engineering profession's efforts in attracting and retaining Indigenous talent and traditional knowledge into both post-secondary engineering education and in the profession. This includes supporting engineering access programs for Indigenous people across Canada by collaborating with both the engineering profession, Indigenous communities, and post-secondary institutions in Canada.

Retaining talent comes after developing it, which is quite challenging in Indigenous communities due to the economic and societal factors that exist. Poverty figures as well as generational impacts of trauma are examples of aspects that need to be addressed if we want to change the representation of Indigenous Peoples within the engineering profession. The federal government must address the Truth and Reconciliation Commission of Canada's (TRC) Calls to Action; specifically, in relation to the call for education for reconciliation, including the inclusion of Indigenous perspectives and content into post-secondary programs. Recommendation 92 of the TRC's Calls to Action asks the corporate sector and their leadership to adopt the United Nations Declaration on the Rights of Indigenous People.<sup>7</sup> The TRC calls for meaningful consultation, long-term sustainable opportunities from economic development projects as well as education and training for managers on the history of Indigenous people, intercultural competency, human rights and anti-racism. Engineers Canada is ready and willing to work with the Government of Canada to achieve the TRC's Calls to Action.

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<sup>7</sup> Truth and Reconciliation Commission of Canada (2015). "Truth and Reconciliation Commission of Canada: Calls to Action." Retrieved May 27, 2019 from: [http://trc.ca/assets/pdf/Calls\\_to\\_Action\\_English2.pdf](http://trc.ca/assets/pdf/Calls_to_Action_English2.pdf).

## Who we are

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Engineers Canada is the national organization of the 12 provincial and territorial associations that regulate the practice of engineering in Canada and licence Canada's more than 295,000 professional engineers. Together, we work to advance the engineering profession in the public interest.