



CANADA'S FUTURE BUILT ENVIRONMENT: Productivity, Talent and Growth

CCI Recommendations for Federal Budget 2018

August 4, 2017



Executive Summary

Canadian Construction Innovations (CCI) welcomes the opportunity to offer ideas to the House of Commons Standing Committee on Finance's pre-budget consultations for Federal Budget 2018.

These recommendations respond to the national priorities that have been articulated by the federal government in the last two budgets particularly in the areas of green infrastructure, climate change, prosperity, productivity and overall industry competitiveness.

CCI has the support of **construction owners, architects, engineers, contractors, manufacturers, suppliers, allied services as well as academia** in advancing these recommendations. Together we believe that developing and implementing a comprehensive innovation strategy for the construction sector will ensure the transformation of Canada's built environment for future generations.

Specifically, we believe this strategy should be enabled in the following ways:

1. That the federal government capture the unique opportunity to partner with the construction ecosystem created by CCI. This joint effort will transform the construction sector and support our ability to meet the national priorities laid out in Budget 2017 around **green and social infrastructure, transportation, climate change, talent and clean technology**.
2. That the federal government support a new R&D collaboration through the development of industry-led incubators dedicated to transforming Canada's future built environment. The incubators would cover a broad range of projects in size and complexity so that such topics as energy efficiency, modern technologies, new products and processes are identified and imbedded in new or existing assets.
3. That the federal government recognize the funding made available by provincial and municipal governments as matching funds under the Infrastructure-Transportation Supercluster. Given the project delivery nature of the industry, these public entities will be the primary beneficiary of many of the products and technologies developed in this Supercluster.
4. That a small percentage of the capital investment in the Infrastructure Bank be directed towards an explicit fund to support innovation activities in the construction sector.

Given its scale and complexity, it will take a significant effort by many to achieve this transformation. But the rewards will be plentiful and impactful. CCI is eager and equipped to lead and support these efforts within the construction sector while focussing in areas that will support productivity, competitiveness, talent, and sustainability.

1.0 About Canadian Construction Innovations (CCI)

The mandate of CCI is to instill a new culture for research and innovation in the Canadian construction industry. CCI is a federally incorporated not-for-profit dedicated to developing a national, collaborative, and industry-oriented innovation strategy for the Canadian construction sector. Born out of the Canadian Construction Association, CCI brings together key construction stakeholders from owners, contractors, architects, engineers, and more to enable the innovation pipeline in the built environment. Since its inception in 2014, more than 50 firms have contributed directly to CCI and its operations. These innovation leaders are dedicated to industry-driven research and development to address industry sector challenges, boost innovation, and position Canada to be an international leader.

2.0 Construction: A Key Cornerstone to the Canadian Economy

Construction is the foundation of the Canadian economy. The industry generates over \$100 billion in economic activity annually, representing roughly 9% of Canada's private sector GDP. The sector employs 1.25 million workers from every community in Canada – roughly 7% of the nation's workforce. Furthermore, according to the National Research Council of Canada, the construction sector is responsible for over 40% of Canada's greenhouse gas emissions and utilizes over 50% of our natural resources.

3.0 The Challenge: Aging Infrastructure and Stagnating Productivity

Canada's global standing in the quality of its infrastructure and asset stock has been falling. The World Economic Forum (WEF) now places Canada 23rd in quality of infrastructure – a steep drop from 10th place fifteen years ago. According to the 2016 Canadian Infrastructure Report Card, nearly 35% of Canadian municipal infrastructure is in fair to very poor condition and at risk of service disruption. The McKinsey Global Institute anticipates that \$57 trillion is required worldwide in infrastructure investment over the next 15 years, simply to keep pace with growth.

Furthermore, over the past decade, the construction sector's productivity has stagnated and its capacity to innovate has been limited. As tracked by Statistics Canada, the R&D effort of the Canadian construction sector is disappointing. With a reported R&D intensity of only 0.06% of GDP, the sector has the lowest R&D spending of all major industrial sectors in Canada. Failing to keep pace with its competitors has impacted the sector's performance at home and its competitiveness and ability to win projects abroad.

As the 5th largest construction sector in the world, **Canada has a unique opportunity to be a major global leader in modern construction practices and exporter of construction services to rapidly developing nations around the world.** To achieve this, we must work together to address these challenges.

4.0 The Opportunities

4.1 Improving Productivity Through Innovation

Canadian governments at all levels are poised to invest an estimated \$750 billion in infrastructure spending combined over the next decade. Furthermore, important initiatives are being led by the federal government to restructure our ability to attract new infrastructure investments globally, through initiatives such as the new Infrastructure Bank.

For Canada to get the most of these investments and succeed within these new investment models, it is critical that the productivity trends be improved. To do this, we must spur innovation and transformation of this important economic sector. Only by adopting new technologies and new practices will Canada's construction sector transform itself to ensure maximum productivity, resource efficiency and overall sustainability.

4.2 Partnering on Bold Actions to Improve Economic Performance

The federal government has a unique leadership opportunity to advance Canada's built environment. It has identified important national priorities for boosting Canada's talent, competitiveness and productivity while at the same time addressing the country's greenhouse gas emissions. In addition, the government plays a pivotal role in the shape and vision for Canada's built environment by establishing new investment priorities, new investment models, infrastructure policies and regulations, and by introducing more flexible procurement and contracting models. That said, there is an urgent need to take a lifecycle perspective to procure innovative solutions that provide the highest total value of ownership (not only contracting to the lowest compliant bid).

Given the unique multi-faceted role of government, CCI believes it is critical for the federal government to play a leadership role and deepen its partnership with the sector's innovation ecosystem to unlock the potential of innovation to drive the sector's transformation and realize overall performance improvements.

This government has recognized that bold, disruptive ideas drive economic growth. By strengthening the link between private sector dynamism with Canada's innovation capacity, the government has set a new course in impactful innovation delivery to improve productivity.

CCI believes the following key areas need to be prioritized for bold action:

A. Technology Adoption

The industry is ill-prepared to handle the ongoing digital transformation that has been described as the fourth industrial revolution. Indeed, the sector is more than a decade behind manufacturing and other industrial sectors in terms of embracing digital technologies and achieving the accompanying growth in productivity. As a foundation for Canadian society, the fact that the pace of infrastructure change is slow is at odds with the much more rapid pace of change that society now expects and requires. CCI proposes to bring to market new products, processes and materials that will increase technology adoption and therefore productivity sustainably across the sector. We believe this is fundamentally important for new builds as well as the retrofit market. We urge the federal government to leverage the various program efforts it has in this area to work with CCI and its supporters to achieve this goal.

B. Talent

A critical area for the sector's future will be the ability of firms to attract, train, and retain the best talent. Introducing new skill sets to the sector will be fundamental to the transformation necessary to improve the sector's productivity performance. In its 2017 report, "Shaping the Future of Construction, Inspiring innovators redefine the industry", the World Economic Forum outlines how critical this issue is to bring about real change to the sector at a global scale. As suggested in this report, this sector needs to create a talented, multidisciplinary workforce and devise agile organizations (including public buyers of construction services) to stimulate and accelerate innovation. These are key elements in positioning Canadian firms aspiring to export their savoir-faire globally. CCI is eager to work with the federal government to address this critical need throughout Canada.

C. Growth

Given the magnitude of the construction industry and the proposed infrastructure funding of \$750B - even just a 1% improvement in construction quality and efficiency would yield billions in savings and added value to Canada. The more Canada invests in transforming and modernizing its infrastructure the more it will be able to attract domestic as well as foreign investment and therefore create growth.

D. Climate

The federal government has made a strong commitment to advance climate change mitigation, increase the development and adoption of clean technologies and encourage the development of green infrastructure.

To achieve our country's long term objectives on climate change, there needs to be a comprehensive approach taken to improving the energy use across the built environment – from design, construction, operations and monitoring of the built asset. By bringing industry players from across the value chain together, CCI is driving the research and innovation needs to meet these commitments. We urge the federal government to bring its resources to bear on addressing these innovation needs.

5.0 Specific Recommendations

Based upon the above information and feedback from a wide area of stakeholders, CCI specifically recommends the following be considered for Budget 2018:

The federal government commits to the development and implementation of a Construction Innovation Strategy to dramatically reshape the future of Canada's built environment for future generations.

This strategy should be enabled in the following ways:

1. That the federal government capture the unique opportunity to partner with the construction ecosystem created by CCI. This joint effort will transform the construction sector and support our ability to meet the national priorities laid out in Budget 2017 around green and social infrastructure, transportation, climate change, talent and clean technology.
2. That the federal government support a new R&D collaboration through the development of industry-led incubators dedicated to transforming Canada's future built environment. The incubators would cover a broad range of projects in size and complexity so that such issues as energy efficiency, modern technologies, new products and processes are identified and imbedded in new or existing assets.
3. That the federal government recognize the funding made available by provincial and municipal governments as matching funds under the Infrastructure-Transportation Supercluster. Given the project delivery nature of the industry, these public entities will be the primary beneficiary of many of the products and technologies developed in this Supercluster.
4. That a small percentage of the capital investment in the Infrastructure Bank be directed towards an explicit fund to support innovation activities in the construction sector.

6.0 Additional Background Material

For more detailed information, CCI would recommend the following documents:

1. *Shaping the Future of Construction: A Breakthrough in Mindset and Technology*, World Economic Forum Report, May 2016; <https://www.weforum.org/projects/future-of-construction>
2. *Shaping the Future of Construction: Inspiring innovators redefine the industry*, February, 2017; http://www3.weforum.org/docs/WEF_Shaping_the_Future_of_Construction_Inspiring_Innovators_redefine_the_industry_2017.pdf
3. *Canadian Infrastructure Report Card: Informing the Future*; 2016; http://www.canadainfrastructure.ca/downloads/Canadian_Infrastructure_Report_2016.pdf
4. *Roundtable Discussions on CCI Innovation Strategy*, CCI Innovations Report, July 15, 2016; <http://www.ccinnovations.ca>
5. *CCI Technology Clearinghouse*; <http://www.ccinnovations.ca/clearinghouse>

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