

Industry trends report 2019

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About the Canadian Construction Association

The Canadian Construction Association (CCA) was founded over 100 years ago and its role has never been more important. Members' firms join CCA through their local or provincial construction associations and are entitled to numerous membership benefits including standard documents, construction guides, as well as engagement in federal public policy and regulatory advocacy.

Across Canada, CCA represents more than 20,000 members firms drawn from 63 local and provincial integrated partner associations. CCA gives voice to the public policy, legal and standards development goals of contractors, suppliers and allied business professionals working in, or with, Canada's non-residential construction industry.

About Abacus Data

Abacus Data offers a suite of research tools and strategy services designed to assist businesses, associations, and organizations of all stripes and sizes to engage with their key stakeholders. They conduct research for and provide strategic counsel to some of North America's leading corporations and advocacy groups by delivering global research capacities with the attention to detail and focus of a boutique firm.

They have the capacity to conduct surveys, focus groups (on- and offline), membership surveys, elite and stakeholder consultations, and build online research communities. They have years of real-world data science experience that has translated into practical insights and actionable recommendations for their clients.

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President's letter

The Canadian Construction Association (CCA) believes passionately in the sustainability and vitality of Canada's construction industry and the industry's pivotal role in building a better Canada. That is why we developed this independent industry trends research report in partnership with Abacus Data, a leading Canadian polling and market research firm. This report provides an overview of the key trends impacting our industry right now and provides insights both on their context and on how our industry perceives their impact over the next five to 10 years.

Significant changes are happening all around us at lightning speed – from political upheaval abroad to insecurities with the level of investor confidence in Canada. Add to this the constant, rapid development of technology and the digitization and automation of services and you have a perfect storm of uncertainty and opportunity.

In a rapidly evolving world, the reliable and regular tracking of trends is important for both businesses and industry to thrive. For key decisions to be taken quickly, businesses need high-quality, curated information. That is the reason CCA took the initiative to create our industry trends report, one that is by the industry and for the industry. We see this as an important member benefit. We hope that with a Canada-wide understanding of emerging trends you are better informed to help position your company for the future.

Mary Van Buren, MBA, CAE President



Executive summary

The Canadian Construction Association (CCA) conducted research and held dozens of interviews with expert representatives from the Canadian construction industry. We looked into and asked about factors that are influencing or will influence the industry over the next five to 10 years, and we categorized them into the five key themes that are explored in this report.

Workforce

- There is significant concern over the projected skills and labour shortages in the construction industry.
- That shortage is partly (and inadvertently) driven by the lagging adoption of new construction technologies by Canadian construction firms.
- It is also driven by demographic issues (an aging workforce), and issues of negative perception around the industry.
- Hard-to-attract groups, such as women and Indigenous communities, will continue to be difficult to attract to the industry unless governments and education institutions work with the industry to showcase it as a fulfilling and well-paid career path.

Technology

- Compared to international construction firms, Canadian contractors are falling behind on the development and acquisition of cost-saving technologies that fill labour shortages and augment the productivity of their workforce.
- The adoption of building information modelling (BIM), advanced software, Internet of Things (IoT), 3D printing, and drones will grow over the next five to 10 years.
- Project owners and government can assist with innovation by allowing for higher margins and other incentives to promote company re-investment in innovation.
- New construction technologies can automate many jobs, but the Canadian construction industry is likely to start with augmentation before automation.

Market forces

- The expected growth of mega-projects could polarize the industry into large general contractors and small sub-contractors, with little room in the market for mid-size firms.
- Mega-projects will also attract bids from more international firms. While this fills the capacity and experience gap, it also takes money out of Canada and away from Canadian firms.
- Volatile trade conditions, such as tariffs and trade wars, make planning for the future difficult.
- Growing government debt means less money is available for infrastructure investment.
- Government policies that prioritise Canadian contractors and commitments to long-term infrastructure investments can bring much needed stability to the industry.

Procurement

- Owners are amalgamating smaller contracts into larger projects, and many are moving to a design-build procurement process. This has the effect of excluding smaller firms.
- Online procurement has made the bidding process more transparent and has altered the traditional owner-builder relationship.
- Canada may see traditional risk-sharing models shift more responsibilities onto contractors. That may impact pricing.
- Design-build can exclude firms that do not have construction or design capacity inhouse.

The future of associations

- Associations must be a strong voice for the industry, and the central information hub for all audiences.
- An association that makes connecting easier will strengthen the industry and help build lasting partnerships.
- During times of rapid disruption associations need to be highly responsive.

Introduction & methodology

The findings in this report were collected through a thorough industry literature review and in-depth interviews with 26 senior thought-leaders in the Canadian construction industry. The research is categorized into five themes that highlight areas being impacted by rapid change:

- Workforce
- Technology
- Market forces
- Procurement
- The future of associations

We look at each trend within the themes in two ways: **Context** provides a brief explanation of the wider environment in which the trend is operating; **Industry perspective** summarizes the views of the industry experts and how they see the trend impacting the Canadian construction industry.

This report is not meant to be exhaustive. Rather, it is a launching point to engage in a wider conversation about how the Canadian construction industry is changing, and how those changes impact all of us.

Workforce

A. There aren't enough workers

Fewer Canadians are choosing construction as a career and more baby boomers are retiring, causing a labour pool shortage.

In context

The traditional Industrial Commercial Institutional (ICI) construction labour pool of approximately 1.4 million people is shrinking. As baby boomers retire and there is a smaller demographic to replace them, combined with fewer Canadians who see the construction industry as an attractive or viable career, the industry will have trouble maintaining a large enough workforce to keep up with construction demand.

Some are put off by the volatile and fluctuating nature of the work; for others the work-life balance isn't there (long hours). With local and trade-specific labour demands, the industry often requires workers to be mobile and many see that need for mobility and travel as a barrier to employment.

And part of the issue is image: our value proposition is fragmented, we don't market our industry to prospective workers adequately to pique their interests in the careers that are available.

For others it's simply economics and opportunity: larger companies offer more attractive pay and benefits packages, sometimes shutting out the smaller competitors; and often prospective workers get trained in construction but eventually move on to other industries that project a better environment and image.

While the shortage will be felt across all construction occupations, it will be more acute among estimators, project managers, and BIM specialists.

Industry perspective

Recognizing the challenge, individual employers and construction associations are working with schools and institutions at all age levels to spark interest in the construction industry and the opportunities it offers, and to train young professionals with the skills our industry needs.

"We've been working with our local college to get their programs producing trades people in the right numbers and in the right areas for the local labour market. But it takes a lot of teamwork."



B. We're falling behind on technology skills

The Canadian construction industry has been slow to adopt and train for new technologies, and our skills are falling behind the demand.

In context

Technology changes everything, and the construction industry is no exception. Prefabrication, smart buildings, and BIM are commonplace in Asia and some European markets, and are changing the way work is done.

The Canadian construction industry has lagged in technology adoption, but that adoption is now being driven by Canadian project owners who want to incorporate the globally popular innovations into their buildings. Canadian educational institutions are working to meet the new demand, but training takes time, and can be very expensive. This skill-lag leaves firms who have adopted new technologies competing over a small number of qualified professionals.

The challenges are exacerbated by an aging workforce: the experienced instructors are older, and less in touch with today's tech needs. The generational gap has grown in our industry. With the average age of senior partners in most firms at 50+ inciting change is challenging, and attracting investors to sponsor that change is challenging. And without that technical advancement, hiring a younger workforce is challenging.

There needs to be a closer alignment between technology and workforce to help fill the gap. In fact, productivity improvement driven by technology can often help to mitigate worker shortages.

Industry perspective

Industry experts admit that the Canadian construction sector has been slow to adopt new technologies. Now that the demand has increased, firms who have adopted new technologies are exhausting labour pools to find the few qualified candidates.

Experts say that this phenomenon is affecting many of the highest-skilled professions including BIM practitioners, estimators, project managers, and industrial electricians. As the industry adopts more technology, it needs to work with education institutions to ensure that skill supply meets new demand.

"Project owners are demanding more and more that we have BIM capabilities in order to work on a project, and the trouble is that we just can't find the people with the right skills fast enough."



C. There aren't enough under-represented groups in our labour force

Public sector project owners are requiring a greater number of traditionally underrepresented groups on the payroll of contractors bidding for their projects. Contractors want to hire from these groups, but the trained labour supply is not there.

In context

The public sector is the largest project owner in Canada. Recently, the Government of Canada instituted the Better Buying procurement plan to, among other things, improve socio-economic outcomes for under-represented groups through procurement. The plan requires project bidders to retain a certain proportion of traditionally under-represented groups in the construction industry to be eligible to bid on projects. Other levels of government have similar procurement policies, and if this trend continues investment will be needed to attract and train members of these under-represented groups. It should be noted, though, that other countries also face an aging population and so immigration may not be the complete solution.

Industry perspective

Industry actively supports the inclusion of women, Indigenous peoples, new Canadians and others in the construction industry. However, it is difficult to find enough under-represented persons with the necessary skills and availability to meet the demand. With low unemployment and a slow immigration process hampering our ability to get workers, we need to work with education institutions and the government to attract more under-represented persons to the industry. Until the supply meets the demand, procurement regulations need to better reflect current labour market limitations.

"We support the desire to hire from under-represented groups, but there's a problem in that we can't always find enough people from them to satisfy the requirements of some owners."



Technology

A. We're lagging in innovation

Canadian construction firms are behind international competitors in innovation. This is driven by a resistance to change and a lack of resources to invest in innovation.

In context

As project owners start demanding new capabilities such as 3D-printed buildings or BIM, and as international players from historically more innovative markets enter into the Canadian construction market to meet that demand, Canadian construction firms will be under ever greater pressure to innovate. Some of Canada's larger firms are well on their way, but many smaller firms struggle to keep up.

Industry perspective

A key barrier is the demand for low-margins on projects: public procurement and the scrutiny on public spending as well as market competition for private sector projects tend to force a race to the lowest cost bid, which results in less investment in innovation. Adopting new innovation can increase risk, which is usually downloaded to the contractor and not shared with the owner. Investment is even tougher for smaller and micro firms, who need to be clearly shown the financial benefit.

To help incent innovation a cultural shift is needed, away from the lowest price to the greatest value. And in many cases, the need is not to innovate (that is, to invent), but to adopt innovation. Companies that recognize the adoption of technology as a corporate process that impacts hiring, retention and their bottom line, and requires needs analysis, change management, and more have an opportunity to leap-frog their competition.

"Project owners in Canada have benefited from a race to the bottom, but if we are to innovate we need margins that allow us to reinvest into the capacity of our company."



B. Technology use is growing fast

The adoption of BIM, advanced software, Internet of Things (IoT), 3D printing, and drones will grow over the next five to 10 years.

In context

Technology feeds itself, and these trends show no signs of slowing down any time soon. BIM has been one of the most pivotal changes in the construction industry in recent years. Big data, empowered by IoT, is enabling advanced software to manage human and material assets on job sites and to better manage resources and better estimate time and costs.

3D printing cuts down on build times and manpower, and drones are now a staple technology and will continue to improve surveying and inspection tasks.

Industry perspective

Before robotics and autonomous vehicles appear on most construction sites there will be a revolution in the back-office technology.

BIM will continue to advance to the point of immersive virtual reality. Advanced people, resource, and project management software will be integrated into worksites powered by machine learning and IoT. The introduction of 3D printing will be slow as standards and building codes limit its commercial uses.

"I think it won't be long until we are taking our project owners on virtual tours of the building and making changes on the fly and in real-time and having those reflected in the plans of all the partners involved."



C. Our industry will augment before it automates

New construction technologies can automate many jobs, but the Canadian construction industry is likely to start with augmentation before automation.

In context

When affordable labour is in low supply, the benefit of automation out-weighs the high cost to acquire it. In countries where there has been a shortage in hourly wage workers, like Japan, surveying, bulldozing, and other tasks have been automated by drones while exoskeletons are being tested to assist with heavy loads and guard against workplace injury.

In markets where hourly waged labour is inexpensive and in abundance, contractors seek more productivity in their back offices, investing in technologies that improve workflows, such as BIM, drone surveying and advanced project management tools. The back office will increase its analytical capacity in the short and medium term until automation is able to compete with higher-skilled labour.

Industry perspective

The Canadian construction industry is at a demographic and technological tipping point, and experts are unsure of the impact of new technology. Many believe that automation of staffed work will cope with the predicted loss in labour force capacity. However, automation costs a lot, and it's not clear if the labour shortage will be large enough to warrant the expense of automation.

No matter what happens on the job site, the back office is undergoing a technological revolution that is **changing (or augmenting)** the roles of many workers, but is less likely to automate workers. Surveyors, once in the field, are now data analysts, compiling telemetry gathered by a drone. Project managers can now track all the workers on a site through RFID tags and measure a project's progress through digitally-filed status reports.

"It looks like we're going to see a workforce shortage over the next decade or so. I don't see robots any time soon, but I think the hourly workers will be replaced as soon as its possible, but I think the back office will ultimately grow."



Market forces

A. 'Mega-projects' put medium-sized firms at risk

As governments amalgamate smaller projects into 'mega-projects' they risk 'hollowing out' the Canadian construction industry.

In context

With the goal of increasing transparency and simplifying the tendering process, governments at all levels have been moving to amalgamate projects, in some cases into 'mega-projects', acting as a sole funder and issuing a single contract to one large general contractor.

This decreases the number of firms that can compete for the projects and limits the capacity of large firms to bid on other projects concurrently. Also, medium-sized firms can't compete at this level as they don't have the capacity and can't compete on price.

Industry perspective

Contractors see a polarized and consolidated future, with potentially only smaller and very large general contractors in the ICI sectors as medium-sized firms will either have to grow their capacity and balance sheets or get more specialized and become smaller to carve out a niche in the larger projects.

Alternatively, mid-sized firms will have to become more comfortable partnering with their peers in joint-ventures to obtain large projects that they are unable to obtain alone. "I think what we're going to see is a hollowing-out of the Canadian construction sector. Mediumsized players are going to either fail or get acquired by the big guys who need to buy their capacity."



B. 'Mega-projects' and our capacity gap attract international competition

Mega-projects are creating a capacity gap that is going to attract more international competition.

In context

As projects grow in size and complexity, larger firms from outside Canada will be attracted by the larger project price tags. Large Canadian contractors participate in large projects, but there is a capacity gap that limits their ability to bid on the increased number of mega-projects. They will have to enter into joint ventures, grow, and acquire small- and medium-size companies to increase their capacity, but this takes time.

Larger foreign firms, who have more robust balance sheets and global capacity, will seize the opportunity to enter into the Canadian market either by establishing a Canadian subsidiary or acquiring a Canadian firm.

Industry perspective

Contractors see more international competition coming from Europe, Asia, and the United States. These 'mega-firms' have greater experience with mega-projects and have balance sheets large enough, and capacity great enough, to fill the capacity gap in the Canadian market. More foreign activity in the Canadian market means less money stays in Canada. Governments should look to help domestic firms grow to compete with international players.

"Foreign companies come into Canada often with the support of their home country. Our government needs to support our own industry so that we can be in the position to not just meet the market need but also grow into international markets. There's unfathomable value in that."



C. Geopolitical uncertainty may slow investment and growth

There is uncertainty surrounding infrastructure investments and the potential of a low to negative growth future.

In context

Several factors contribute to the current uncertainty in the industry.

Domestically, infrastructure dollars have been slow to be released. Also, the changing duty to consult and environmental assessment processes have slowed the speed of project approvals on many major projects.

The cancellations of some major projects have reduced private investment in infrastructure, and increases in the projected government debt of around 30 per cent of GDP suggests that there will be less money to spend on future infrastructure projects. Internationally, there is the potential that countries will pursue more protectionist policies and increase tariffs and other trade barriers on resources essential for the construction industry, or close market access all together.

Industry perspective

Contractors worry that the change in the regulatory environment, the cancellations of large projects, and the slow disbursement of infrastructure money from the federal government could mean slow times for construction in the next five to 10 years. Upcoming federal and provincial elections also add uncertainty as tightening government spending has been a major theme overall. If governments were to announce clear timelines and investment commitments, simplify consultations and assessments, and secure more access to foreign markets it would positively affect the industry outlook.

"We've got tariffs on our steel products, a trade war with China, and our federal government is deficit-spending during relative good-times. What will happen if we get a recession in the next two years? I'm doing well right now but like I said, I'm uncertain what the future holds for the sector."



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Procurement

A. 'Mega-projects' admin burden squeezes out smaller firms

For many smaller firms, mega-project proposals constitute an administrative burden that is too complex and resource-intensive to allow them to bid.

In context

There has been a global shift towards megaprojects, and more are being funded by governments directly rather than through the traditional P3 method. In Canada, mega-projects tend to be either in energy or public transit, such as the \$40B LNG facility in British Columbia or the \$9B Eglington subway extension line in Toronto.

Large contracts limit the number of industry players that can compete for them because their complexity demands extensive experience and qualifications.

Industry perspective

Industry experts are concerned that bid qualification conditions such as experience on similar projects, retained expertise, and liability insurance are becoming too complex and burdensome for many firms to navigate. This increase in qualification complexity has impacted the industry in three ways:

- 1. Timelines are too short for proper project assessment. With all the requirements that need to be addressed by the contractor, firms both large and small noted that they did not always have enough time to finish an adequate assessment of the project before the tender closed.
- 2. Smaller firms find the paperwork itself too complex to complete during bid processes and decide to forego the opportunity to bid.
- 3. The disqualification of smaller firms results in less understanding of the local regulatory framework during the project (the larger international firms may lack local insight).

In this environment, some capable contractors are deterred from bidding on projects for which they are well -suited, and the competitiveness and overall health of the industry declines.

"Take a city like Toronto for instance. They used to divide a sewer renewal project up every few blocks, giving everyone a piece of the pie. Now, all the renewal is one big contract. It's squeezing a lot of smaller guys out."

B. Electronic procurement has reshaped bidding

Electronic procurement has reshaped the bid process towards increased transparency and accountability.

In context

We've gone digital! Public and private project owners in Canada have switched to electronic procurement systems. Through platforms such as MERX that feature competitive open bidding, procurement has become much more transparent.

It has also become more accessible as opportunities are available to all contractors who have an internet connection. In the old closed or preferential bids system, firms were in a better position to charge clients a premium for their relationship as being the contractor of record. Electronic procurement and open bidding bring competition and public scrutiny to the table.

Industry perspective

Experts feel that relationships are less important than they once were. The shift to electronic procurement portals coincided with a shift in procurement culture. Rather than a nontransparent closed environment, bids are now often available for public or shareholder viewing and judged more strictly on the qualifications outlined in the open tender. However, relationships still have their place: they can

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act as 'tie-breakers' when prices and expertise are equal.

Electronic bids also make it easier for firms to compare competitor proposals and improve their own.

"The process is a lot more open and transparent; you can see competitors' bids from your computer as opposed to going to the town hall or city office. It makes it easier to see why they chose one bid over another."



C. Unfair risk allocation is destabilizing pricing

The off-loading of risk from the owner to the contractor and continuing downward pressure on price is an unsustainable model.

In context

Owners—particularly government owners have sought to off-load more risk onto the contractor. Traditionally, environmental, utility, and similar risks were not fully assumed by the contractor. Recently, project owners have been requiring that project bidders assume those risks, effectively increasing the time and cost of the bid.

Industry perspective

The industry has been feeling the increased burden of risk placed on it, predominately by public owners. The burden is compounded as owners continually press for the lowest bid price and, with the increased cost of assuming the risk, profit margins become thinner across the industry. Further, some owners use non-standard contracts that are not reviewed or understood by the contractor, downloading even more risk to the contractor. The model is not sustainable at current price levels, and so, project owners need to more equally allocate project risk or should expect a destabilization of prices.

When it comes to procurement and risk, the perception gap between owners and contractors needs to be bridged to enable more fairness, more equitable profitability, and more innovation. "We're not used to assuming all these risks. I think we're at a tipping point; the cost of pursuing these projects and assuming all the risks are beginning to outweigh the projects themselves."



D. More design-build projects mean less risk for owners, more leverage for bidders

More owners are moving to a design-build procurement model, which can have a positive effect on bid price.

In context

Many owners are moving away from the designbid-build tendering process – where one firm designs the build and a contractor bids to build the project – to a design-build process. This move follows the larger trend of reducing owner risk by shifting greater responsibility and liability to the contractor.

Notably, the design-build process provides more leverage to the bidding firm, adding another aspect beyond price on which their bid can be judged.

Industry perspective

There have been mixed reactions to the transition from design-bid-build to design-build. Firms with the capacity to design a build prefer this method because it adds another variable beyond price to their bid. They find that they can get a better margin on their winning bid and can build a novel structure. Firms that do not have the design capacity feel left-out and would rather bid on the work itself rather than the design. "We like design-build. It allows us to compete on something other than price, its closer to a 'for value bid' where you're judged on the quality and novelty of the design you're building rather than just how cheaply you can build a cookie cutter."



Future of associations

A. Information hub and strong industry voice

The association of the future will be the information hub and a strong voice for the industry.

In context

Industries that go through rapid disruption, as the construction industry is poised to do over the next five to 10 years, need a strong, singular voice and information hub to communicate with government and other industry allies. With our industry speaking in one voice through one unified source of information, government and allied industries always know where to look for answers.

Industry perspective

Associations at all levels need to be the information and advocacy conduit from industry to government and other industry allies. For small and medium players – the ones most vulnerable to rapid change – associations will need to advocate and lobby for continued support of the industry through the uncertain times ahead.

Having a central hub for all constructionrelated issues, such as regulatory changes, new government programs, and member priorities, allows Canada's builders to focus on building rather than advocating. As the market shifts, a quick information conduit for government and contractors becomes increasingly more valuable.

"I think associations need to focus on these two things. One, be a loud advocate for the industry, always be top-of-mind for politicians. Two, make life easier, streamline communications, only tell us what's important and link us to things that will grow our business."



B. Industry connector

The association of the future will be the connector within the industry.

In context

Associations strengthen the industry they represent by reducing the barriers of communication and amplifying the network effect. Firms that have better access to peers, partners, labour supply, bid notices, government programs, and industry news are stronger than those in isolation. Connection and communication are the most valuable aspects of the association and these becomes more valuable during times of market disruption, where access to information and resources become more important.

Industry perspective

The industry foresees many disruptive forces entering the sector, and it is looking to associations to be the connector, by connecting employers to the supply of in-demand talent, creating events for firms to meet their peers and make partnerships for joint ventures, and proactively connecting industry to government programs, and notifying and explaining the impacts of regulatory changes

An association that makes connecting easier will strengthen the industry during this time of disruption.

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"What we will need, I think, are associations that will give us the tools to succeed. We're going to need a lot of new talent for the technology we're going to have, help me find it, help me find partners, and link me to government programs that will make me more competitive..."



C. Proactive and agile

The association of the future will be proactive and agile.

In context

Associations need to be as fast as the industry they represent, and during times of rapid disruption associations need to be highly responsive. Their agility can strengthen the industry as firms look for an association partner who can rapidly provide answers or support to their fast-changing problems.

Associations need to audit their offerings and maximize member value, cutting programs that provide little value and amplifying or adding programs that do.

Industry perspective

The rapid change that the industry foresees will need to be addressed by swift and confident associations. In some cases, decision-making processes will have to change and new technologies adopted to quicken the reaction time of associations. Contractors do not see the association as the manager of change, but rather as the service provider that can proactively give them tools and best practices to solve immediate problems. "One thing is clear, if associations, at every level, don't improve their reaction time to issues that are affecting the industry in the moment they will become irrelevant. And if they become irrelevant, we will have to find new, more responsive means of connecting and advocating for the industry."

