

2020 INFRASTRUCTURE REPORT

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WELCOME LETTER

The volume of infrastructure work to be done in Canada represents exciting opportunity for contractors. Among the challenges is the persistent gap between what must be built and the funding to do it.

B2W Software is pleased to sponsor this year's Infrastructure Report because we believe a cohesive software strategy is an important part of the conversation about how to bridge that gap.

Effective systems for estimating, resource scheduling, field tracking and equipment maintenance are important. The bigger opportunity to manage infrastructure projects more efficiently, however, lies in how those systems – and the people using them – work together and share data in real-time to drive collaboration across these interdependent workflows.

A unified software platform can also enhance data-driven decision making across estimating and operations. Getting information is not the problem: it comes at contractors from a dizzying array of sources. What a software platform brings is structure and easy, automated reporting, enabling contractors to aggregate data, analyze it and make it actionable in the office and in the field.

Employee expectations are changing too. Experienced veterans, as well as the next generation of employees, use technology in their everyday lives and are less willing to switch back to paper and spreadsheets when they come to work. Contractors that provide an advanced and inspiring technology platform gain an important competitive advantage in recruiting and retaining talent.

Infrastructure construction presents opportunity and challenge for Canada's contractors. We look forward to continuing to help you break new ground by utilizing our ONE Platform to win more work and complete it more profitably.

Sincerely,

Paul McKeon
Founder and CEO, B2W Software

A handwritten signature in blue ink, appearing to read 'Paul McKeon', written over a light blue horizontal line.



CARRYING ON

Canadian infrastructure market shakes off COVID-19, poised to put stimulus funds to work

BY DAVID KENNEDY



Crews working on a road widening project on Vancouver Island.

PHOTO: B.C. MINISTRY OF TRANSPORTATION

Between deserted highways, abandoned schools and empty rail cars, much of Canada's infrastructure has never been as underutilized as it was in April and May.

Health care facilities and telecommunications networks, on the other hand, have rarely been so strained.

Through it all, as the economy ground to a halt and questions swirled over whether Canadians would ever be coaxed back onto subways or into classrooms, construction kept inching forward on new transit projects, new schools and new public works that presumed the country would emerge from the pandemic into something resembling normal.

"Contractors found a way to keep reasonable productivities going," says Gary Webster, the national leader of KPMG Canada's Infrastructure team, as well as the firm's global head of Capital Projects Leadership.

"COVID didn't have as big an impact on the construction industry as we originally worried about," he added. "A lot of things carried on."

Bill Ferreira, executive director of Build-Force Canada, credits the industry's focus on safety and its ability to adjust to new circumstances for the large number of sites able to remain active.

"I think what we're seen over the last three months is just how well this industry can adapt in a very short time frame," he says.



ALEX POTEMKIN / E+ / GETTY IMAGES



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It is an attribute that is particularly important on the infrastructure side of the business.

"The reality is, [for] civil work, you have to be very adaptable," Ferreira says. "You're always dealing with potential delays related to weather, soil conditions. This is just one additional layer. There are added expenses obviously as related to providing PPE to workers, but by and large, social

distancing is a little easier to do when you're in an outdoor environment."

But unlike retail and hospitality, and other industries that took hard, short-term hits from COVID-19, the pandemic's effect on Canadian infrastructure is likely to play out over a matter of years.

Paul Gill, the National Valuations leader and a partner at accounting and consulting firm BDO Canada, expects a large amount

of capital to move into infrastructure in the months ahead, but cautions that when, and if, Canada returns to the status quo will determine what areas of the sector will see the biggest benefits.

"Are there going to be changes in funding? Or going to be changes in priorities when it comes to infrastructure?" he asks, adding that for now, governments are generally continuing to push forward with plans already on the books.

"The long-term view is that things are going to get back to normal," Gill says. "As long as that thesis still holds and the world's not going to fall apart... by the middle of next year, things will start to really get back to normal."

But with a highly fluid situation persisting in all industries, uncertainty remains unavoidable.

CHECKING IN ON THE IICP

Front and centre in previous years, COVID-19 has relegated the federal government's \$187.8 billion Investing in Canada Infrastructure Plan (IICP) to the back-burner in

2020. Despite being out of the limelight, spending has continued, and prior to the pandemic, Ottawa was regaining some of the ground lost to delays early in the spending plan.

The latest assessment from the Parliamentary Budget Officer (PBO), released this June, found investments under the plan remained delayed, but the lag had lessened since its previous check. The PBO estimates a total of \$51.1 billion spent on approximately 53,000 federally-backed infrastructure projects coast to coast since the start of the IICP. The figures, which factor in reporting from fiscal 2019-20, indicate the federal government is about \$2 billion short of its planned investment level for the first third of the 12-year initiative.

In terms of job creation, the PBO said the infrastructure plan has generated about 91,400 full-time equivalent positions over the past four years. It added that without the delays in spending, about 4,400 more

“*The long-term view is that things are going to get back to normal.*”
– **Paul Gill, BDO**

construction workers would have found a place on job sites.

It is still too early to measure the effects the pandemic may have on the tens of thousands of projects under the 12-year spending plan, but most ongoing work was deemed essential and allowed to continue through the spring shutdowns.

Though COVID has sown some doubt about certain categories of infrastructure – transit that relies on packaging as many people as possible into a rail car, for instance – for the time being, governments are expected to continue pushing ahead on

their existing agendas.

“I think everyone is looking at COVID-19 as a blip,” Ferreira says. “I don’t think at this point anyway that it is going to fundamentally change design forever.”

To date, Ferreira added, there has been no indication governments across the country intend to overhaul their infrastructure priorities as a result of the pandemic. In fact, after a brief pause in new funding announcements in April and May, the federal government has begun returning to the field to kick-start new projects.

Ottawa has also created a separate COVID-19 stream under the IICP that focuses on getting pandemic-related infrastructure built more quickly. In May, Infrastructure Minister Catherine McKenna said the government is setting aside up to 10 per cent of the \$33.5 billion provincial-linked IICP stream to address infrastructure challenges laid bare by COVID-19. Amending previous provincial agreements

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struck with Infrastructure Canada, the stream will see the feds pick up a larger share of project costs.

The federal government has remained non-committal on other added spending or changes to the IICP, so far, but Ferreira anticipates a stimulus plan will emerge this fall.

ADDITIONAL HELP

With little movement from Ottawa, half of Canada's provinces have taken unilateral action.

Alberta, Manitoba, Nova Scotia and Saskatchewan have already announced stimulus spending as a result of the virus. With the pandemic near its worst in mid-May, Quebec also added \$2.9 billion to its 2020-2021 capital plan.

Other regions have been more reluctant to increase funding at a time government revenues are under considerable pressure. Ontario, for instance, has committed to sticking to its pre-pandemic pipeline for major P3 projects, but thrown cold water on the idea of adding to it.

"We can be assured with this big

pipeline that we have announced and are reconfirming that we have a very big stimulus package happening right here in the province of Ontario that we are determined to continue with," Laurie Scott, the province's minister of Infrastructure, said during an online event hosted by the Canadian Council for Public-Private Partnerships (CCPPP) this June.

While work on megaprojects in Ontario and elsewhere will continue, Webster anticipates much of the short-term stimulus funding will go toward repair and maintenance work.

"A lot of the investment is being targeted at the areas of state of good repair projects and those sorts of things, which are the right projects to get people working quickly," he says, adding that the regulatory process makes it tough to get major new projects off the ground quickly.

The pandemic may also help boost the Canadian government's long-term push to shift private capital into infrastructure work.

With some of the lustre off the real estate market, at least for the short-term, Gill sees infrastructure as an attractive, safe

IN RESPONSE TO COVID-19

Added provincial infrastructure funding:

Alberta	\$10 billion
Quebec	\$2.9 billion
Saskatchewan	\$2 billion
Manitoba	\$500 million
Nova Scotia	\$230 million

Updated federal funding (previously on the books):

IICP COVID stream	\$3.3 billion
Accelerated Gas Tax	\$2.2 billion

alternative for deep-pocketed investors.

"There's a lot of financial investors, like pension funds, sovereign wealth funds... insurance companies that are



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looking to park their money,” he says. “Historically, they’ve had to go international because there wasn’t really this appetite to build new infrastructure projects in Canada.”

But with Ottawa and individual provinces looking to finance new infrastructure to put people back to work, as well as address the country’s worsening infrastructure deficit, Gill says encouraging private capital into infrastructure would be a win for both parties.

The Infrastructure Bank was created partly for this very purpose. So far, the crown corporation has announced 10 projects it is working on in some capacity. About half of these projects have funding attached, but the bank remains well below its goal of deploying \$35 billion into new infrastructure work.

“A lot of the investment is being targeted at the areas of state of good repair projects... which are the right projects to get people working.

– Gary Webster, KPMG

A NEW REALITY

About six months after Canada reported its first COVID-19 case, provincial governments appear to have largely contained the virus, but the return to normal still looks distant.

Contractors have adapted, bolstering health and safety protocols to keep staff safe, as well as turned to technology to

modernize long-established ways of working. The continued embrace of cloud technology to better connect job sites to head offices, improve documentation and eliminate contact points during material deliveries, are just a few examples.

Webster sees the pandemic as an opportunity for infrastructure planners to bring similar improvements into the procurement and project delivery process.

“Government could use this to help transform the industry,” he says, pointing specifically to the opportunity for better collaboration between owners and contractors and what is increasingly seen as a risk-sharing mismatch on P3 projects.

The uncertainty on what projects will be required in the future also extends beyond transit. Ontario recently cancelled a major courthouse project, for instance, saying it will instead look to “new and innovative ways of delivering justice remotely and online.” The same dilemma applies to areas such as virtual healthcare and education.

“A lot of the [infrastructure] was planned quite a few years ago, based on traditional ways of doing things,” Webster says. “I’m just not sure what the new economy’s going to dictate and drive as people realize that some of those plans are going to have to change,” he says. “I think government is going to have to be a little more flexible in some of those programs.” □



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SPANNING the BORDER

COVID-19 may be a game-changer, but Gordie Howe looks to score longest span

BY SAUL CHERNOS

When shovels broke ground on the Gordie Howe International Bridge project at the Windsor-Detroit border crossing in October 2018, the notion of a game-changing pandemic was largely the domain of science fiction. Now, it's an everyday reality, with COVID-19 forcing organizations and enterprises the world over to meet a new, demanding environment. While transportation-related construction has been prioritized due to the importance attached to infrastructure and maintaining supply chains, managers of even the most critical projects have struggled to meet ever-evolving demands and challenges – and the Gordie Howe is a case in point.

Border crossings between the United States and Canada have been shut to travel deemed non-essential since mid-March, yet, construction of this newest link has carried on despite unprecedented physical distancing strictures, shortages of materials, travel restrictions and the acknowledged likelihood that age-old societal norms will be significantly transformed for years to come. In June, when project

leaders wanted to trumpet a grant program that's been integral to community relations efforts, proponents shelved the usual news conference and celebration in favour of a virtual assembly, with participants showing up in offices and living rooms, albeit with an artfully designed bridge backdrop.

"We're unable to host a tour of the construction sites but we'll be providing some B-roll which shows the tremendous work currently underway on all four components of the project," Windsor Detroit Bridge Authority CEO Bryce Phillips announced when he welcomed journalists to the online event. "We look forward to hosting you on-site and in person in what I hope will be the near future, but with these unprecedented times everyone has had to adapt, and that includes our team. The health and well-being of our staff, contractors, stakeholders and the public is paramount."

In response to the virus, project leaders shuttered community liaison offices in both countries and enacted a no-visitors policy at its Windsor headquarters. "We provided the necessary equipment for our



Tower foundation work at the site of the new bridge, which will span 853-metres.

PHOTOS: WINDSOR DETROIT BRIDGE AUTHORITY

staff to work remotely so we could continue our oversight...and remain in contact with each other and with the public and stakeholders," Phillips explained. Wearing masks, screening daily for symptoms, and working two metres apart – six feet in the U.S. – crews proceeded with the tasks that were underway when COVID-19 was declared a pandemic in mid-March.

Aaron Epstein, CEO of Bridging North America, the construction consortium leading the project, outlined accomplishments to date. With final designs undergoing specialist review, the preparation that constitutes Phase 1 is well underway.



By mid-June, crews had demolished and were already replacing three bridge crossings along the Interstate 75 approach to the bridge on the Michigan side. The reconstruction was needed to adjust for a redesigned road profile and includes excavation, erection of abutment walls and pile driving to build solid foundations for roadwork that will eventually follow.

At the Canadian port of entry, crews had installed more than two-thirds of 150,000 prefabricated vertical 'wick' drains and roughly 650,000 tonnes of engineered fill as surcharge. Workers at the U.S. entry have 57,600 of 157,000 wick



A recent concrete pour at the bridge project. Progress has been slowed by the pandemic, but the timeline remains intact.



drains in place, along with fill.

Early work on the bridge itself is also coming together. Two dozen ten-metre-diameter drill shafts for the bridge footings have already been completed, and by mid-June the construction team, made up of ACS Infrastructure, Fluor and Aecon, were working on tower footings and foundations for the main bridge. “We’re expecting to see some of those tower foundations continue throughout the summer, and you’ll be able to see some of that above the ground later this year,” Epstein said.

While COVID is an undeniable impediment, Phillips and Epstein told the virtually assembly the projected end-of-2024 completion date remains unaffected. Epstein confirmed some productivity impacts stemming from scheduling work crews, getting them on-site, and training

them on government safety protocols and evolving industry standards. “It’s a complex project, and one of the things we do is figure out challenges, whether they’re engineering challenges or project management challenges,” he said. “The pandemic is ongoing, so at this point in time the best information we have and the best scheduling we have is that we’re still on or close to schedule.” In fact, Phillips noted, the project has consistently passed Ontario labour ministry health and safety spot checks. “A lot of stuff is being learned by a lot of people... and they’re doing a very good job ensuring construction continues safely,” he said.

The project also faces many of the technical hurdles that come with building what’s billed as the planet’s fifth longest cable-stayed bridge and one that stands to

have the longest main span of any cable-stayed bridge in North America. “The challenge is always the geotechnical work, the stuff below the ground, because ground conditions always give you something unique,” Terry Poole, construction manager with Bridging North America, tells On-Site. “Each drill shaft acts a little bit differently, and luckily we’ve had some really good specialty contractors helping us.”

Poole described ground conditions as typical to southern Ontario – a layer of clay over top of bedrock. And, with the bridge crossing the Detroit River, the soil is saturated – a condition exacerbated by historically high water levels upstream in Lake St. Clair. Weather in general is a year-round challenge, and specified winter plans have crews tarping fresh concrete work and pumping in heated air to



A rendering of the Gordie Howe bridge that will connect Windsor, Ont. with Detroit on the opposite side of the river.

“The challenge is always the geotechnical work, the stuff below the ground, because ground conditions always give you something unique... Each drill shaft acts a little bit differently.”
– Terry Poole,
Bridging North America

facilitate nighttime curing.

The immediate proximity to water also demands precise engineering to manage heavy equipment and complex operations. For instance, engineers needed to redesign the tie-back system and move its elevation up a notch to keep it above water levels. “The planning aspect that goes into the whole effort has been challenging and Terry’s team has done a great job in doing that in order to bring the cranes in that we need to do the work,” Epstein says. “They’ve had to figure out how to make sure we have enough stability to support all the construction equipment so close to the river.”

Of course, the main challenge involves designing and erecting an 853-metre span that has no footings in the water. This avoids impeding river traffic and potentially

affecting fish and other aquatic species, yet requires deft engineering and the right tools for the job. While barge-mounted cranes are often integral to major bridge-works, crews have two 50-tonne-capacity tower cranes on dry land to help place footings, towers and other components. The 820-foot-tall Comansa cranes will be slightly higher than the 722-foot towers. Two 330 ton crawler cranes on each side of the river will help in the back-span area for the bridge approaches, and smaller hydraulic cranes will also chip in as needed. Yet, while the hoisting power is considerable, crews will still need to ensure machines don’t handle more than their rated and engineered capacities and will cease operation when winds become too strong. “Everything will have a pre-pick plan on paper and we’ll go through everything,” Poole explains.

The lengthy span itself had to be designed to withstand the strongest potential gusts. The project team undertook wind tunnel tests, using models to replicate wind conditions in a specially purposed room. “We put it in a couple of times as the design progressed,” Poole explains. “We’d see the reactions, then go back and tweak more things so the engineering dovetails

with how the builders are going to build it and what equipment we need. There’s lots of moving pieces, lots of meetings, and lots of drawing, iterations and reviews.”

While the physical challenges are considerable, political and financial underpinnings have also required careful handling. Gordie Howe played for the Detroit Red Wings, but for his name-sake bridge, Canada is footing the entire CAD\$5.7 billion fixed price contract up-front by means of a P3 arrangement that includes all construction and a 30-year operations period. And, while the bridge will be jointly owned, Canada is looking to eventually recover costs. Mark Butler, director of communications with the Windsor Detroit Bridge Authority, said the Crossing Agreement Canada and Michigan signed in 2012 stipulates no cost or financial liability to Michigan or its taxpayers as a result of the state’s participation with this project either during the construction or once the crossing is operational. “As such, Michigan will not receive any of the toll revenue from the operation of the crossing until all costs related to the project have been recouped,” Butler said, adding that the U.S. government is responsible for fitting up and staffing border operations.

There may also be the element of pay-back time. The Bluewater Bridge, not far north, between Port Huron, Mich. and Sarnia, Ont., was financed entirely by the U.S. “I’m not saying it’s our turn, but we were in a position where we were able to finance it,” Butler said. “We were happy to do that, recognizing that it’s going to be good for the Canadian economy, indeed for both countries.” In fact, the Gordie Howe has enjoyed cross-partisan support from both countries, and multiple jurisdictions conducted complex environmental and other permitting processes. “It’s been said to be one of the most complicated and complex joint environmental assessments in Canadian history,” Butler said. “We had to get all those permits in place before we could get the Presidential Permit and start moving.” □