

ReNew

March/April 2020

C A N A D A

The Infrastructure Magazine

- + Financing
Broadband
- + Building
Around Transit
- + Climate Action

REMOTE POWER

Renewable Energy for Canada's Isolated Communities



At EXP, partnership is part of our mission,
and we are driven to deliver. EXP is bringing innovation
to complex P3 projects around the world.

Together, let's explore the possibilities.

understand | innovate | partner | deliver

exp.com



12



10



14



26



8

ReNew

CANADA

The Infrastructure Magazine

MARCH/APRIL 2020

FINANCE

8 Financing Broadband

Discussing solutions for financing broadband infrastructure for small and remote communities across Canada.

By Adam Provencher

ENERGY

10 Powering the Nations

Completion of the largest single-phase wind power project in Canadian history brings renewable energy to remote communities.

By Andrew Snook

12 Remote Power

Appreciating the solutions for removing diesel-generated power in small-scale communities across the country.

By Dylan Heerema

ENVIRONMENT

14 Financing Resilience

The adoption of natural infrastructure solutions can help provide flood resilience in our urban cores.

By Dimple Roy

TRANSIT

18 Building Around Transit

We look at two intersections slated for the Ontario Line, and discuss how to build thoughtful transit-oriented development at each location.

By Andrew Macklin

20 BRT vs LRT

A look at the decision-making process to understand whether to implement a BRT or LRT transit system.

By Bern Grush

24 Lessons from Crossrail

We sit down with former Crossrail chairman Sir Terry Morgan to find out what lessons can be learned and applied to Canadian transit projects.

By Andrew Macklin

INNOVATION

26 Cloud Storage

The implementation of cloud storage systems is providing vital protection of key infrastructure assets during times of natural disaster.

By Dave Hamilton

CAPITAL PROJECTS

30 Climate Action

Understanding the opportunities for decarbonisation with the Canadian infrastructure landscape.

By Toby Heaps, Aleena Naseem, and Laura Väyrynen

HEALTH & WELLNESS

32 Head Check

Recognizing that the time has come to address mental health issues with the Canadian construction industry.

By Andrew Pariser

TOP100 PROJECTS

34 Projects Update

Pattullo Bridge proponent, Bruce Power Unit 6 MCR

36 Dinner Celebration

Our exclusive coverage of the 2020 Top100 Projects Key Players and Owners Dinner at The Carlu in Toronto.

DEPARTMENTS

4 Editor's Note

Andrew Macklin on why we need to work with contractors, not against them, to face modern mobility challenges.

5 Front

Asset management funding, regional transportation

22 Panorama

Rising Rails.

40 People & Events

Appointments, announcements, company news, and event reports.

42 Closing Shot

Pick up the Pace!

By Chris Gardner



BUILDING IN THE URBAN CORE

By Andrew Macklin

Sometimes, well-intentioned ideas lead to shortsighted solutions, ones where the individuals involved clearly do not appreciate the impacts of their actions.

Such is the case in the City of Toronto, where Councillor Josh Matlow decided to take out his frustration over road closures on the building industry. Upset with the number of sidewalk, bike lane, and road lane closures that are occurring as part of the redevelopment of the city, and more to the point the length of said closures, Matlow decided that legislation was necessary to enforce greater restrictions, institute compensation structures, and potentially not allow closures to occur at all on some projects.

His suggestions are, well, absurd, even if the intention of his proposals are not. You see, Matlow clearly thinks these closures take too long, even though little to nothing has been presented by the elected official to back up his claim. And furthermore, the bulk of his frustration clearly comes as a direct result of the riding he represents, which lies at the heart of the development of the new Eglinton light rail transit system. With closures that have lasted years as a result of the building of new transit hubs, underground infrastructure, and/or surface level rail infrastructure, it's easy to understand how the councillor is reaching his limits for living and working in the middle of a construction zone.

His frustration is misguided. And yet, shrouded by his existing frustration, an important debate simmers at the root of the issue.

Do urban municipalities pay enough regard to the length of pedestrian

and road infrastructure during the construction of commercial, residential, and municipal assets in existing urban cores? Because Matlow's right, it is frustrating to see long closures of vital portions of pedestrian and vehicle routes in busy urban areas. There should be a movement afoot to minimize those disruptions as much as possible.

Rather than look to absurd suggestions that developers should learn how to develop new buildings and infrastructure assets without spilling onto mobility routes, we should lean on our planning departments to work with developers on solutions to reduce closure times, and make that municipal and provincial governance supports it. Put the construction industry on notice that abuse of pedestrian and roadway closures will result in fines, but do it based on the mutually agreed upon construction schedules set during the approvals process. In addition, incentivize the development industry for the SAFE reduction of the time they need to have roads and pedestrian routes closed. Work with the development industry, rather than throttle them with unreasonable requests that have not been properly thought out.

There is a way to address Matlow's concerns. But it is far from what he is suggesting. Work together with the industry. Work with your planning department. Through thoughtful and constructive dialogue, we can find ways to reduce development's impact on our surface mobility routes. ✱

Andrew Macklin is the managing editor of ReNew Canada.

andrew@actualmedia.ca

March/April 2020 Volume 18 Number 2

MANAGING EDITOR Andrew Macklin

GROUP PUBLISHER Todd Latham

PUBLISHER Nick Krukowski

ART DIRECTOR AND SENIOR DESIGNER Donna Endacott

ASSOCIATE EDITOR Simran Chattha

CONTRIBUTORS Bern Grush, Dave Hamilton, Toby Heaps, Dylan Heerema, Aleena Naseem, Andrew Pariser, Dimple Roy, Andrew Snook, Laura Väyrynen

ADVERTISING Nick Krukowski
nick@actualmedia.ca

ADVISORS Nick Reid, James Shrolla

actualmedia

ReNew Canada is published six times a year by Actual Media Inc.

actualmedia.ca

150 Eglinton Ave. E, #806, Toronto, ON M4P 1E8

Phone: 416-444-5842

Subscription/customer services: 416-444-5842 ext. 211

ReNew Canada subscriptions are available for \$39.95/year or \$64.95/two years and include the annual Top100 Projects report.

©2020 Actual Media Inc. All rights reserved. The contents of this publication may not be reproduced by any means in whole or in part, without prior written consent from the publisher.

Printed in Canada

"ReNew Canada" and "ReThink. ReBuild. ReNew" are Trademarks of Actual Media Inc.



Undeliverable mail return to:
150 Eglinton Ave. E, #806
Toronto, ON M4P 1E8

Canadian Publications Mail Product Sales Agreement
40854046
ISSN 1715-6734

Proud members of



Join the conversation. **Search "ReNew Canada" on LinkedIn.**

For daily news and discussion, visit

@ReNewCanada

/ReNewCanada

Renewable energy development in remote regions of Canada are reducing diesel reliance and lowering GHG emissions. Learn more about the recently-completed Henvey Inlet Wind Project on page 10, and the future of remote energy on page 12.

RAPID BUS TRANSIT INTRODUCED IN THE GVA



TransLink has launched its new RapidBus service in the Greater Vancouver Area, improving bus service frequency and reliability where demand is greatest. The significant increases in service will add 65,000 more annual bus service hours to the system, making space for up to 20,000 more people each weekday.

The new service, launched on January 6, will impact the following new and existing routes:

- R1 King George Blvd (Guildford Exchange/Newton Exchange)
 - Eight-minute service during peak hours
- R3 Lougheed Hwy (Coquitlam Central Station/Haney Place)
 - 10-minute service during peak hours
- R4 41st Ave (Joyce Station/UBC)
 - Three to six-minute service during peak hours
- R5 Hastings St (Burrard Station/SFU)
 - Four to five-minute service during peak hours

Outside of peak hours, all RapidBus routes will have 15-minute service or better from 6 a.m. to midnight, seven days a week. To make the bus system more efficient, adjustments have been made to some Metro Vancouver bus routes.

For faster service between Bridgeport and UBC, it is recommended that customers take the Canada Line and the R4 RapidBus connecting with Oakridge Station.

According to an article from the Vancouver Sun, the R2 Marine Drive route running between Park Royal in West Vancouver and Phibbs Exchange in the District of North Vancouver, will open in April.

The third phase of TransLink’s 10-year plan calls for five additional routes to be added to the RapidBus system. 🍁

NEXT ISSUE: MAY/JUNE
THE RENEWAL ISSUE

Eliminating Lead

Strategies for creating lead-free communities.

Built to Last

Solutions for Canada’s aging assets.

The Alliance Model

Understanding the new method of asset procurement.



Mactaquac Dam in New Brunswick.

HYDRO-QUÉBEC, NB POWER ANNOUNCE NEW AGREEMENTS

The CEOs of Hydro-Québec and NB Power, Éric Martel and Gaëtan Thomas, have announced the signing of three partnership and development agreements. Under these agreements, a large volume of electricity will be exported from Québec and imported into New Brunswick; a technical collaboration will be initiated between the parties to refurbish concrete at the Mactaquac generating station; and discussions will begin regarding the construction of additional interconnections between the two provinces.

Under the first agreement, Hydro-Québec will export a total of 47 terawatt hours (TWh) of electricity to New Brunswick between now and 2040. These exports will be transmitted over existing interconnections. New Brunswick has had an agreement with Québec on energy imports since 2012, and this will build on that agreement.

For the coming years, Hydro-Québec will have enough energy available to continue its initiatives in neighbouring markets: enough to supply annually more than four million households.

The second agreement provides for technical collaboration between Hydro-Québec and NB Power for part of the refurbishment of Mactaquac generating station (pending regulatory approvals), in order to extend its useful life at least until 2068.

Over the years, Hydro-Québec has developed expertise that can help limit the impacts of alkali aggregate reactivity while ensuring the long-term operability of the affected structures. The company will provide expert advice, handle design aspects, and ensure technical supervision of the project.

“Thanks to a major build-out of our generation facilities, Hydro-Québec has a lot of energy available, and we’re thrilled to be contributing to New Brunswick’s clean energy supply over the next two decades,” said Éric Martel, president and CEO of Hydro-Québec. “We’re also very proud that our expertise will help NB Power keep the Mactaquac generating station in operation until at least 2068.”

The third agreement calls for discussions to begin regarding the construction of additional interconnections between Québec and New Brunswick, to increase electricity exports to Atlantic Canada and the United States.

“We are very pleased to continue our long and beneficial partnership with our neighbours in Québec,” said Gaëtan Thomas, president and CEO of NB Power. “Not only will this result in more clean energy for our province and Atlantic Canada, but Hydro-Québec’s expertise in AAR mitigation will be very helpful to our Life Achievement project at Mactaquac and will translate into significant capital cost savings on the project.” 🍁

Advertising Deadline: March 27, 2020
To reach our influential readers in print and online, contact nick@actualmedia.ca



Federal Funding for Asset Management Development

Catherine McKenna, Minister of Infrastructure and Communities, and Bill Karsten, President of the Federation of Canadian Municipalities (FCM) have announced just over \$5.7 million in funding to 18 partner organizations from across the country to deliver asset management training activities, including group learning and hands-on training opportunities, accessible to communities of all sizes.

The funding is directed towards helping municipal employees and elected officials gain asset management knowledge and skills to support better infrastructure investment decisions. Events include asset management training, workshops, webinars, and courses

(including certifications) offered online and in regions across the country until June 2021.

Participants will also learn about asset management and how to implement practices using their community's data; incorporate best practices into their municipality's day-to-day operations; implement approaches that will help their municipality make cost-saving and sustainable infrastructure decisions; and, learn from other municipalities and use customizable tools and templates.

Partners delivering training activities are Canadian non-profit, non-governmental organizations with a mandate to serve the municipal sector and are uniquely positioned to help municipalities develop and enhance

their skills and knowledge. For example:

The Alberta Urban Municipalities Association, in partnership with Rural Municipalities of Alberta and Infrastructure and Asset Management of Alberta, will be developing groups to learn together and work through the development of an asset management policy and strategy.

The Association francophone des municipalités du Nouveau-Brunswick (AFMNB) will offer a number of training opportunities. AFMNB will provide training opportunities on asset management at their annual conference. The organization will also create a support service for municipalities to help them use existing, best in class asset management materials. AFMNB will also provide peer learning and individual coaching to help municipalities develop and apply practical asset management skills.

NAMS Canada will deliver a Professional Certificate in Asset Management Planning course in English and French. The course will give municipal participants a solid foundation in asset management and support them through the creation of an Asset Management Plan for their organization.

Funding for the partner organizations is available through the Municipal Asset Management Program (MAMP), an eight-year, \$110 million program funded by the Government of Canada and delivered through the Federation of Canadian Municipalities.

To obtain more information on training activities offered, visit bit.ly/AM-MAMP. 🌟



Ontario Releases Its First Regional Transportation Plan

The Government of Ontario has released its first draft plan to build a better regional transportation system in southwestern Ontario.

“People in southwestern Ontario deserve access to a safe and reliable transportation network that gets them to where they need to go,” said Minister of Transportation Caroline Mulroney. “Our plan for southwestern Ontario includes real, practical transportation improvements that will connect our cities, towns, villages, and hamlets by improving our roads and highways, improving accessibility, and ensuring bus, rail, and local transit services are as seamless as possible.”

Ontario's plan, *Connecting the Southwest*, contains more than 40 advancements and strategies, including options for improvements to existing rail corridors and private-sector partnerships to optimize passenger and freight rail. It also includes improvements to southwestern Ontario's highway network and intercommunity bus services.

The southwestern Ontario transportation plan marks the beginning of comprehensive

regional transportation planning for the province, and will be informed by engagement with municipal leaders, Indigenous communities, community leaders, businesses, and transportation experts.

The province is also consulting the public to gather feedback and explore strategies to implement actions in the plan. Ontarians can participate by completing the online survey until March 17, 2020. *Connecting the Southwest* is a living document that will evolve throughout the consultations and as new and innovative technology advances.

Ontario is developing regional plans across the province, starting with southwestern Ontario. Regional planning is also underway for the Greater Golden Horseshoe, Northern and Eastern Ontario.

As part of the plan, the province will establish a task force with municipalities and Indigenous communities that will look at better integrating rail, bus, and local public transit across southwestern Ontario to provide people with a seamless travel experience.

To read the plan, visit bit.ly/ONTranPlan. 🌟

Photo: jobtalksconstruction.ca



Julia, site supervisor

Photo: jobtalksconstruction.ca



James, framer

Photo: RCCAO



Andy Manahan, RCCAO

Photo: jobtalksconstruction.ca



Larissa, bulldozer operator

VIDEO SERIES PROFILES REWARDING CONSTRUCTION CAREERS

Imagine if your teenage child could go to the guidance counsellor's office to learn about career possibilities by looking at three display walls – one for universities, one for colleges and one for skilled trades.

On that wall for skilled trades, there would be a monitor for young people to watch dozens of informative, short video profiles of people explaining their construction careers, sourced from the Job Talks Construction website at jobtalksconstruction.ca.

“We need to get the message out that there are thousands of well-paid, rewarding jobs that will be available for young Ontarians in the coming decade,” says Andy Manahan, executive director for RCCAO, part of a coalition that commissioned a 50-part video series.

In fact, construction research group BuildForce Canada reports in its 2019 labour market forecast that more than 103,900 new workers will need to be recruited in Ontario alone over the next 10 years because of the rising number

of retirements and to meet peak demands – that's for residential, infrastructure and other construction sectors.

The executive director of Job Talks Canada, a work-related media and research company that promotes careers in the skilled trades, says this video series focuses on job satisfaction. Jon Callegher adds: “Our profiles feature young people who embrace construction for its highly satisfying careers and enjoy the challenges of problem-solving. I think our coalition has done an excellent job of conveying a new image of working in construction: a future of possibilities that are bright, exciting, secure and fulfilling.”

The coalition also includes four RCCAO partners: the Heavy Construction Association of Toronto, the Toronto Area Road Builders Association, the Ontario Sewer and Watermain Construction Association, and the Ontario Construction Careers Alliance.

See the video series at jobtalksconstruction.ca.



RESIDENTIAL AND
CIVIL
CONSTRUCTION
ALLIANCE OF
ONTARIO

RCCAO

Constructing Ontario's Future

e: media@rccao.com

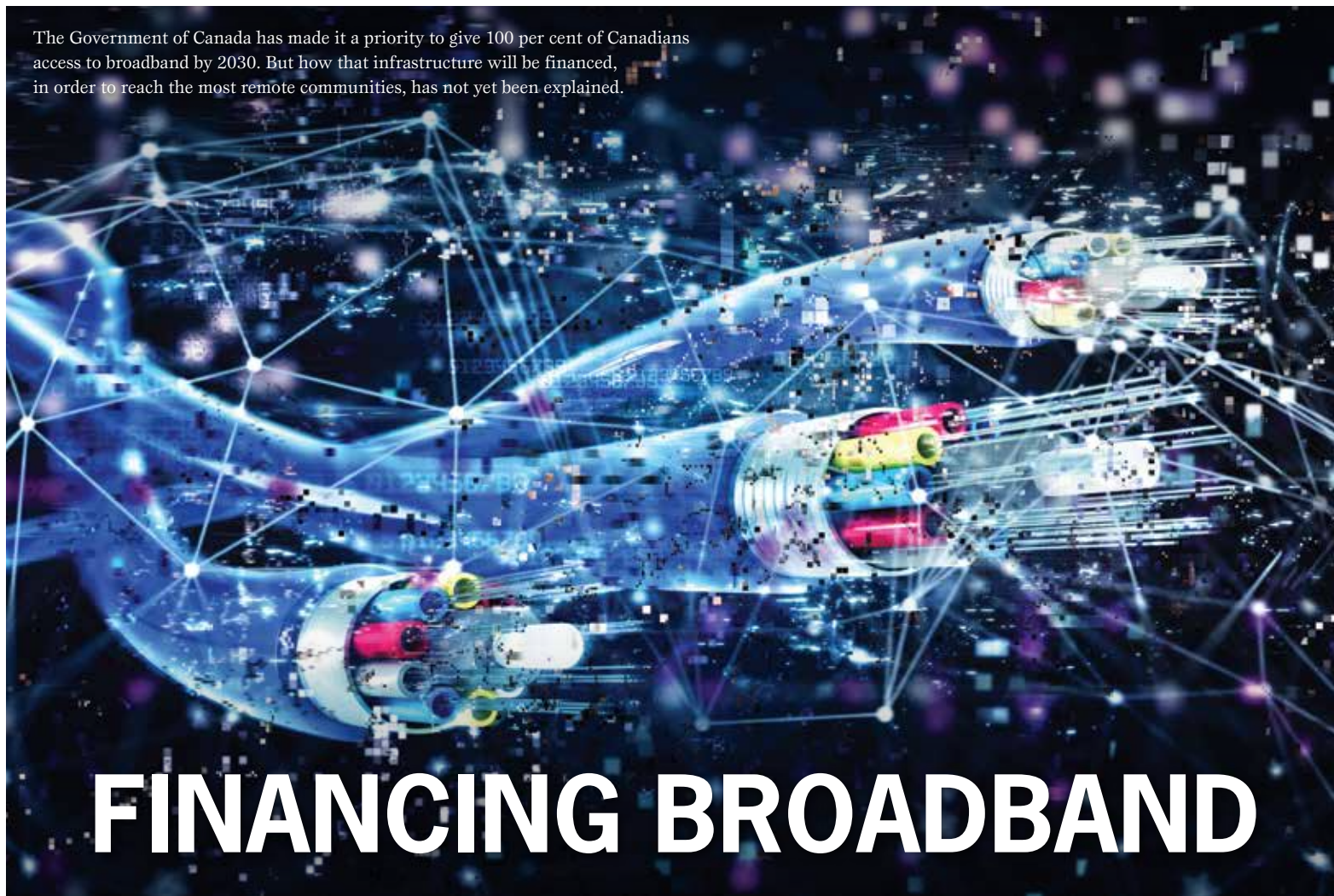
 [@_RCCAO](https://twitter.com/_RCCAO)

rccao.com

Partnered with:



The Government of Canada has made it a priority to give 100 per cent of Canadians access to broadband by 2030. But how that infrastructure will be financed, in order to reach the most remote communities, has not yet been explained.



FINANCING BROADBAND

Bringing connectivity to rural Canada. *By Adam Provencher*

Having access to broadband internet has become essential to life in Canada. Broadband internet is required for everything from online educational opportunities, transmitting x-rays for remote diagnostics, to connecting with global customers, or for remote working opportunities. The importance of having access to broadband internet is only going to increase in importance over the next decade.

In urban Canada, ubiquitous access to broadband internet makes it easy for Canadians to forget that not all have access to broadband internet. There is a significant urban/rural divide in Canada for broadband internet service. As of 2017, broadband internet which is currently defined by the Canadian government as 50 megabits per second (Mbps) download and 10 Mbps upload, were available to 97 per cent of urban Canadian homes but were only available to 37 per cent of rural households and to 24 per cent of households in Indigenous communities. The lack of broadband internet access in rural Canada is because of rural Canada's remoteness and lack of population density makes the cost for private companies to build out broadband internet to rural areas uneconomical without government support.

Because of this, the Canadian government has set out to address the urban/rural divide for access to broadband internet. It has set ambitious targets of bringing broadband internet access to 95 per cent of Canadians by 2026 and 100 per cent by 2030. To meet these targets it has committed up to \$6 billion to meet these goals by supporting different programs and technologies. For example, in 2019 it entered into a memorandum of understanding (MOU) with Canadian Satellite Operator, Telesat to contribute up to \$600 million to develop a network of low earth orbit (LEO) satellites. LEO satellites operate approximately 42 times closer to earth than the current geostationary satellites that are used for internet access. Because LEO satellites operate so much closer to earth, it allows them to transmit information much faster and with considerably less latency. The launch and commissioning of a LEO satellite network should be able to greatly improve internet access to Canadians in the Arctic and other remote communities.

Fibre optics

However, the gold standard for broadband internet access is a lot closer to earth. Fibre optic cables have been used to transfer information at high speeds since the 1980s.

Currently there are millions of kilometres of fibre optic lines laid across the world, with single fibre optic lines stretching more than 18,000 km in length.

Fibre optic connections are good for transmitting information over long distances, with very little latency and at speeds of 100s of giga bits per second (Gbps). Fibre optic lines are laid by digging a trench, laying the cables, and then covering the trench.

Fibre optics is not affected by weather conditions or electric magnetic interference like other communication methods like copper wires, radio or satellites. This provides additional certainty to rural Canadians. Fibre optic wires also benefit from a long-life expectancy. Unlike, copper wiring systems that continuously send electrical signals which results in corrosion decreasing the reliability and increases operating costs over time. Fibre optic cables are non-metallic and use light to transmit information. Many of the initial fibre optic lines were laid in the 1980s and operated at 100 Mbps. With upgraded equipment, those cables are now able to transmit information up to 10 gigabits per second (Gbps).

Rural fibre

Because of the benefits of fibre optic lines, rural Canada sees the value in fibre optic connections. Rural Canadians are demanding access to these fibre optic systems and such systems are being built in remote communities. In 2019, the Canadian Government said it will provide \$151 million in addition to the Government of Nunavut's \$30 million in funding to build a 1,700-km fibre optic line from Iqaluit across the Davis Straight to Nuuk, Greenland. Construction of the line is expected to be completed by 2023. When completed the line will allow Iqaluit to connect to existing fibre optic connections from Greenland to Europe. This will dramatically improve Iqaluit's access to broadband internet and will eliminate Iqaluit's need to use satellites to connect to the internet, which will free up much needed satellite capacity for other smaller Canadian Arctic communities.

Dark fibre

Although there are many benefits for rural communities having access to fibre optic lines, the costs to bring fibre to rural Canadian areas can be substantial. To offset these high costs, Canada can consider different ways to fund the construction of fibre to their communities. A model that the Government of Estonia used successfully to deliver fibre to rural Estonia was the Estonian Wideband Infrastructure Network (EstWin). The network is operated by the Estonian Association of

the EstWin network directly to customers. The ISPs can use different methods to connect end users to the system either through the construction of new fibre optic lines directly to customers, through existing copper cabling, or wireless connections.

This method of delivering fibre to rural communities provides governments with different benefits because the governments retain ownership over the long-term physical fibre network. However, the governments are not exposed to the risk of choosing which technology to deploy on the network or operating the network itself. This delivery method also allows for market competition and innovation as different ISPs can install their own fibre optic equipment and develop different last mile wiring which could allow for different ISPs to compete for customers across different service levels and prices points.

Public-private partnerships

Governments in Canada are also using different delivery models to develop rural broadband. The Government of the Northwest Territories (GNWT) used a public private partnership (P3) delivery model to construct the Mackenzie Valley Fibre Link (MVFL). MVFL involved the construction of 1,154km of fibre optic cable from McGill Lake, Alberta (740 km north of Edmonton) to Inuvik, Northwest Territories.

The winner of the P3 was the consortium Northern Lights General Partnership

the ownership and revenue risk from the asset and gave the design, commissioning, maintenance and lifecycle and financing risk to NLGP. GNWT estimated that by following the P3 process for acquiring this asset it saved \$18.2 million compared to if it followed a design build bid (DBB) project.

DBB projects

But governments are still using regular design bid build (DBB) procurement methods for rural fibre, as in the case of the government of the Yukon's Dempster Fibre link project that will link Dawson City, Yukon and Inuvik. This line will give these local communities access to a redundant service for communities along the network. The Government will follow a traditional procurement process of doing a DBB procurement project, which is expected to cost \$70 million. The completed line will be leased and operated by Northwestel under a 20-year lease.

Last mile

Getting rural access to broadband doesn't stop once a community has access to a fibre line. Internet access still has to get to local homes or businesses. Developing a competitive market for local ISPs can be a policy goal for rural fibre as was the case for GNWT's MVFL project.

Once the community has access to the broader internet through the fibre link there are multiple options to service individual premises. The solution that provides the bandwidth capacity is fibre to the premises (FTTP). This is where the ISP runs fibre directly to the premises and which offers customers a very high-speed connection to the internet at speeds of more than 1 Gbps. Building out FTTP does involve significant expense. The last mile internet service can also be delivered to premises through existing copper such as telephone lines or television cables. This would not offer the same speeds as FTTP but should be able to meet broadband speed requirements.

The Canadian government's goals of bringing broadband internet to 100 per cent of Canadians is a challenging goal. However, by using different business models and delivery methods, developing rural broadband could make these ambitious goals more easily achievable. 🌱

Fibre optics is not affected by weather conditions or electric magnetic interference like other communication methods

Information Technology, which was funded by a ministry of the Estonian Government. EstWin was constructed with the goal of bringing ultra-fast internet access to within 1.5 km of all rural households in EstWin's service area. The Estwin project involved the construction of 6,500 km of fibre optic cable across the country. The project was approximately 85 per cent funded by the European Agricultural Fund for Rural Development with the difference funded with bank loans.

The EstWin project is a "dark fibre" or "middle mile" network where the network has no powered equipment. EstWin leases out fibre lines to 15 internet service providers (ISP) that connect their own equipment and to provide the "last mile" connections from

(NLGP), which is comprised of Leducor Developments Ltd., Leducor Technical Services, and Northwestel Inc. The project entailed both the fibre optic cable and the telecommunication equipment. The project was developed under a design build finance operate maintain (DBFOM) model. The consortium will operate and maintain the project under a 20-year project agreement with GNWT paying the consortium annual availability payments based on NLGP maintaining certain operating targets. Following the expiry of the project agreement, the fibre optic line's ownership reverts back to GNWT.

With GNWT using the P3 mechanism it was able to isolate its risks to the risks they were willing to accept. GNWT retained



Adam Provencher is the assistant vice president, energy, at DBRS Morningstar in Toronto.



Credit: Pattern Energy

POWERING THE NATION

Landmark wind power project reaches substantial completion. *By Andrew Snook*

The completion of the largest single-phase wind facility in Canada marks a historic moment for renewable energy development across the country.

The Henvey Inlet Wind power facility, a 300-megawatt (MW) power facility on the northeast shore of Georgian Bay that became operational this past September, is a pioneer project in many respects.

In addition to being the largest single-phase wind facility in the country, this project is also the biggest wind installation to be developed on First Nation reserve land (Henvey Inlet First Nation Reserve No. 2); and was the first to develop a First Nation Environmental Stewardship Regime under the First Nations Lands Management Act, according to Pattern Energy Group LP CEO Mike Garland.

The project is designed to generate enough renewable energy to power 100,000 homes annually. It was jointly developed and is jointly owned and operated by Pattern Development and Henvey Inlet First Nation, each of which own a 50 per cent stake in the facility.

“It’s obviously a really unique and special project,” says Frank Davis, country head for Pattern Canada. “It was a huge challenge for us.”

Davis’ company was involved in the project for over five years, roughly half the time the Henvey Inlet First Nation were working on the project.

“It’s an initiative, really, of the First Nation,” Davis says. “They obtained their power contract in 2011 by their own initiative, using their own sources of financing, and they have been working on this for over a decade, so obviously it is a pride for our company to be involved, but obviously the rewards associated with the project are enormous.”

upwards of 20 permanent full-time staff and is estimated to generate indirect employment for over 100 people.

Overcoming obstacles

Being a pioneer in an industry never comes without obstacles to overcome along the way, and Davis says there certainly were some challenges during the development of this project.

One of those challenges was planning out its construction on a relatively uncharted terrain.

There’s no reason why First Nation communities like this can’t be investors or participants in projects off- reserve as well

The Henvey Inlet Wind facility is expected to generate more than \$10 million annually for the Henvey Inlet First Nation. The company has a 20-year Power Purchase Agreement with the Independent Electricity System Operator (IESO) for 100 per cent of its production. The facility also employs

“The average wind project we build elsewhere in Ontario is typically built on farm land. It has been farmed for 200 or 300 years so it is a very predictable landscape – very easy to access, relatively easy to conduct your required environmental studies, your required

cultural heritage,” Davis explains. “All those forms went out the window and we had to start from scratch.”

From a physical terrain perspective, finding ways to create access onto the reserve was a challenge.

“We had to find a way to construct turbine foundations on a terrain that was comprised of water and wetlands or on solid Canadian Shield granite,” Davis says. “That presented, at the outset, an enormous construction challenge, which requires a lot more technical preparation by way of engineering studies and by way of transportation studies—ensuring that we can responsibly and safely set this land to do the required removal of rock and re-purposing of rock. That aspect we knew would be a remarkable challenge.”

Another new obstacle for the company was the permitting process.

“Ontario laws, by way of environmental laws, environmental permitting laws, don’t apply on a First Nation reserve,” Davis explains, adding that the company had to navigate new waters working with the Henvey Inlet First Nation under the federal First Nations Lands Management Act.

“We knew that would be a tremendous legal

challenge to figure out how to do this in a way that’s compliant with federal laws, that’s going to protect the environmental attributes that the First Nation wanted to protect that were of the utmost importance of the community, but also allow the project to get constructed on time and on budget,” Davis says.

A host of outside experts needed to be consulted, including environmental consultants.

“They did volumes of environmental studies on the reserve,” Davis says. “As well we needed legal expertise to help navigate the very murky legal waters that we were entering—no one had attempted to do this type of project before on a First Nation reserve, so we needed to ensure, obviously, we had a legal framework that was properly done and respected and complied with all the various rules we were subject to.”

Lessons learned

Working on this type of unique project, taught Davis and his company a great deal that he believes will carry on with them into future projects.

“It taught us lots of lessons about how to build a project like this on terrain like this; but I think the most important lesson you

take out of this is actually how to design and implement a successful partnership with a First Nation community, which will lead to resource development like this on a reserve,” Davis says. “I think this could present a new frontier of opportunity—not only for renewable energy developers like us, but really for all developers of all types of public infrastructure. New opportunities to develop not only critical infrastructure for their reserves, but there’s no reason why First Nation communities like this can’t be investors or participants in projects off-reserve as well [...] after 10 years of intensive development on this project, it definitely can be viewed as a crowning achievement and is a great relief to finish this work and to now begin returning the benefits of this project to the First Nation and the surrounding communities.” 🍁



Andrew Snook is a business-to-business writer based in Mississauga, Ont.

From the brilliant solutions we create with our clients, to the open and inclusive culture we create for our people,

solving today's real estate, facilities, land use and infrastructure challenges requires a team that can look beyond near-term concerns to catalyze solutions to urban issues — that's Jacobs.



Jacobs

Challenging today.
Reinventing tomorrow.

Follow us @JacobsConnects



A diesel fuel farm at Kasabonika Lake First Nation, north of Sioux Lookout.



POWERING REMOTE CANADA

The future of energy in rural communities. *By Dylan Heerema*

There are approximately 170 remote Indigenous communities in Canada, found in nearly every province and territory (except Prince Edward Island, New Brunswick, and Nova Scotia), with a combined population of over 100,000 people. Remote communities are overwhelmingly reliant on diesel fuel for heating and electricity generation—70 per cent are powered by diesel generators, a polluting fuel that has to be transported into the community at a high cost. While some communities are accessible by permanent road, many are only accessible by plane, boat, or winter road. Collectively, remote communities in Canada consume more than 90 million litres of diesel fuel every year for electricity generation, and around the same amount for heating. In addition to environmental issues, burning diesel for heat and power also creates local health issues. Because of this and other factors, many Indigenous communities have a desire to develop clean energy projects and control more aspects of their energy system. There is tangible momentum across remote

Indigenous communities in Canada shifting away from diesel reliance and toward clean and sustainable sources of energy, with dozens of projects in operation or development. The motivations for this shift include the high cost of energy, reducing environmental and health impacts, pursuing new economic development opportunities, and advancing self-determination. However, along with the opportunities it brings, making this transition is not without its challenges.

The high cost of diesel reliance

With fuel deliveries being critical and infrequent, an interruption in supply could be catastrophic for many communities. Energy security in remote areas is becoming more and more threatened as climate change shortens the season for the ice roads that many communities depend on. Reliable access to essential services like heat, light, refrigeration, and communication may become more tenuous as a result.

Relying on diesel fuel is also expensive, especially in remote communities where

everything already costs more, from housing and travel to food and services. The average home in a representative northern Ontario community consumes the equivalent of 40 barrels (each containing 159 litres) of diesel each year for heat and electricity. This translates to an energy bill of over \$3,000 per year—more than twice that of the average Canadian household. Some communities in the Yukon pay even more, with household energy bills averaging \$4,500 per year.

Microgrid innovation

Since remote communities are not connected to the North American electricity grid, they make use of their own small-scale microgrids. A microgrid encompasses the whole system that provides electricity to the community; this includes diesel generators, distribution wires, and control systems, plus any sources of renewable energy, such as wind, solar photovoltaic, biomass-fuelled combined heat and power, and small-scale hydro. There are many successful examples of renewable energy sources, energy storage, and control systems being integrated with

diesel generators in remote communities to create hybrid microgrids.

Hybrid systems can include innovative technologies like variable speed diesel generators, which can pair with renewable energy sources more efficiently, and battery storage systems, which allow renewable energy to be stored for use when it is needed. The list of innovative projects incorporating these technologies continues to grow, demonstrating that reduced operating costs, carbon pollution, and reliance on imported diesel fuel are all possible.

Utilities, communities, and new partnerships

In most remote communities, diesel microgrids are owned and operated by a regulated utility. When independent power producers (IPPs)—which increasingly are community-led ventures, build and own renewable energy projects, the utility is still responsible for managing the overall safety and reliability of the microgrid. However, in the traditional model of structuring electricity rates, the utility is not able to make a financial return in exchange for holding this responsibility. Rather, the utility's profit is determined based exclusively on the value of the assets it owns, meaning that there is no natural incentive for the utility to sell less power or give up control of its infrastructure.

Integrating renewable energy from IPPs can be an effective way for utilities to acquire

and innovative energy system is evolving that incorporates new values of energy security, local self-reliance, and energy democracy, as well as meeting environmental performance and decarbonization goals. The system that is emerging favours a transition to distributed energy production and demand management, which is not well

powerful step towards advancing energy sovereignty. Leading jurisdictions such as B.C. are already directing their regulators to explore this option, making energy independence a realistic option for the future. Changing the regulation of utilities so their business is not eroded when communities acquire their own generation assets would help bring them on board as partners in this transition.

Along with new technologies, regulatory and business model reforms have the potential to accelerate the clean energy transition for remote communities. Governments, regulators, and utilities across Canada need to respond to Indigenous-led momentum, shifting and advancing policies and practices in order to enable fair and equitable access to diesel reduction opportunities and the accompanying economic, social, health, and community benefits. Navigating the changes that need to take place will require meaningful dialogue, transparency, and visionary thinking between governments, utilities, and communities, driven by Indigenous leadership and a desire for communities to be in control of their own energy future. 🍁

Many Indigenous communities have a desire to develop clean energy projects and control more aspects of their energy system.

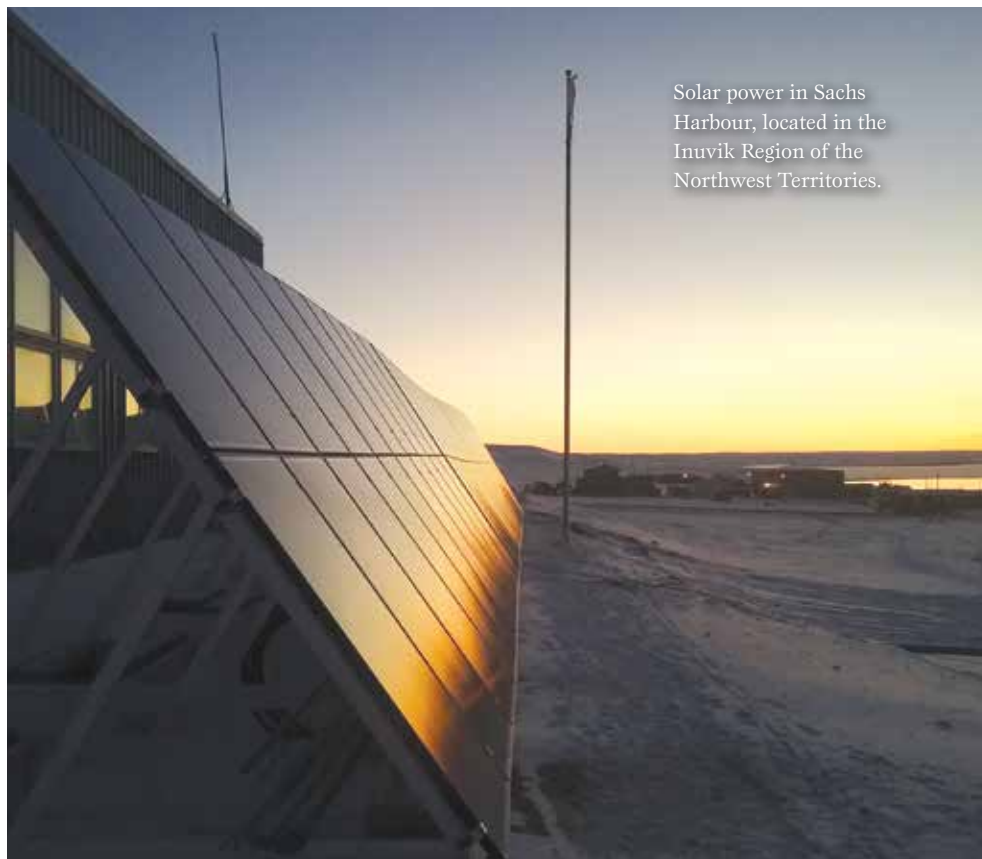
additional electricity or decarbonize their current system without needing to raise large amounts of capital to build projects. However, incorporating renewable energy increases the complexity of operating a microgrid—a risk and responsibility carried by the utility. The size and number of projects that IPPs and communities are able to pursue are limited, as the utility typically sets limits on the amount of renewable energy it believes it can integrate while still meeting reliability requirements and keeping electricity rates the same.

The need to decarbonize electricity grids worldwide and the emerging and clear benefits of distributed, renewable energy are challenging this approach. While the goals of providing safe, reliable, and affordable electricity have not changed, a more modern

matched to the traditional utility business model and regulatory compact. The old way of providing electricity is sunsetting.

The future of energy in remote communities

In many cases, communities are advancing their energy objectives despite the uneven policy approach of many governments and utilities. Such policies often maintain control over decision-making affecting Indigenous communities, and offer inadequate opportunities for Indigenous engagement and participation. Communities such as these might eventually take on the role of the utility, completely decolonizing how their energy has been provided to them for decades. For remote Indigenous communities, this has the potential to be a



Solar power in Sachs Harbour, located in the Inuvik Region of the Northwest Territories.

Credit: Pattern Energy



Dylan Heerema is a senior analyst and researcher at the Pembina Institute.



Photos: ISD

Green infrastructure, like the floating wetland seen here, can provide significant environmental benefit with a minimal cost outlay.

FINANCING RESILIENCE

How natural infrastructure can boost Canada's resilience to flooding.

By Dimple Roy

Whether you consult meteorological data or rely on others who are studying long-term trends, you will arrive at the same conclusion: due to the intensifying impacts of climate change, Canada is being subject to increasing incidents of natural disasters, including flooding.

And while the physical impacts of increased flooding on Canadian communities are clear, what is often forgotten is the economic fallout, especially the fact that insurance payouts for these disasters often depend on Canada's already burdened government coffers.

We need to mitigate the physical impacts of flooding if we want to reduce the financial burden and, of course, protect our communities and municipalities.

This is where natural infrastructure (NI) offers an exciting potential for harnessing the

power of nature to mitigate nature's impacts.

What is natural infrastructure and why does it matter?

Natural infrastructure includes naturally occurring or naturalized areas or systems that are intentionally managed to provide multiple benefits for the environment and human well-being. It differs from traditional "grey" infrastructure—such as pipes, dams, and factories—that is completely constructed by humans for a specific purpose. NI is distinct also from "green" infrastructure where any intervention, built or natural, counts if it provides an environmental outcome, such as in a built water treatment plant.

The 2016 Canadian Infrastructure Report Card highlighted that one-third of the country's municipal infrastructure is in "fair, poor, or very poor" condition, increasing the risk of service disruption. This widening

infrastructure gap, the increased risk related to climate change, and a need to meet day to day services has led to a growth in the uptake of NI projects as a viable complement, or even an alternative, to grey infrastructure options.

For example, the Insurance Bureau of Canada, the Intact Centre on Climate Adaptation, and the International Institute for Sustainable Development recently reported that the damage caused by flooding across Canada could be significantly mitigated if more were invested to retain, restore, enhance, and build NI, such as wetlands, water retention areas, and riverbeds.

How can municipalities harness the power of natural infrastructure to protect their communities?

While the potential benefits of NI for Canada's municipalities are clear, the

At Pelly's Lake in Manitoba, natural infrastructure has been restored around the lake to provide additional environmental benefits that help both the watershed and human health.



execution requires two key processes for which currently two distinct funding paths exist: planning and implementation.

Planning involves the assessment of municipal needs, flood risks, and impacts; collaborative planning, conducting feasibility studies; benefit-cost analyses; business planning; and inventories of current natural assets.

Take, for example Canmore, Alberta. After its catastrophic floods in 2013, it opted to

The implementation stage then involves technical analyses, design, and engineering elements, and getting shovels in the ground to implement all that the planning stages have revealed.

Public sources of funding for natural infrastructure

The most prominent potential funding programs for NI is current government funds for infrastructure where a portion of funds

resilience, and disaster mitigation; and environmental quality.

There is also the Disaster Mitigation and Adaptation Fund that supports natural infrastructure including projects of over \$2 million directed at the mitigation of and adaptation to the impacts of climate change.

These two programs primarily fund the implementation stage, as do provincial programs such as Manitoba's Conservation Trust.

There are other federal programs that contribute in various ways to the planning stage. Natural Resources Canada's BRACE program, for example, provides funds for communities as well as small and medium enterprises to adapt to climate impacts. Agriculture Canada's Canadian Agricultural Partnership supports NI on agricultural lands and Environment and Climate Change Canada's Climate Action Fund focuses on increased awareness and capacity for climate adaptation. There is also the First Nation Adapt program that focuses on assessments and responses for emergency management and floodplain mapping for communities at significant risk of flooding.

In addition to the federal programs

Green bonds are currently the most mature form of debt instruments used to finance projects with an environmental outcome.

accelerate its resilience planning efforts and develop a climate change adaptation plan focused on mitigating risks from forest fires and floods. Its advice to other communities facing similar risks is to systematically plan for risks such as flooding through collaboration and facilitated discussion.

have been allocated for green initiatives.

For example, the Investing in Canada Infrastructure program supports green infrastructure and has announced funding for water and wastewater treatment plants. The program also funds projects that support climate change mitigation; adaptation,

mentioned above, the Federation of Canadian Municipalities supports both planning—such as for natural asset management, and implementation—focused primarily on green infrastructure projects.

Looking further afield for funding opportunities

Socially responsible investing or socially conscious/ethical investing—which includes green bonds, sustainable bonds, and resilience bonds—can provide also emerging opportunities to support NI projects.

Green bonds are currently the most mature form of debt instruments used to finance projects with an environmental outcome. A bond allows a government or other entity to borrow money from investors and pay them back over time.

The Government of Ontario has successfully launched five green bond issues to date, totaling \$4 billion. The projects funded to date predominantly focus on clean transportation and energy efficiency. While green bonds are relatively new in Canada, their issuance is growing rapidly. Green bonds issued until now in Canada have focused on green infrastructure and

the model would need to be adapted to accommodate NI projects explicitly.

There are some international models that are promising. In the Netherlands, the government recently issued one of the largest green bonds ever (5.98 billion euros) including natural infrastructure for low carbon development and water management. This is while the New York Subway System and Amtrak issued their own catastrophe bonds (akin to health insurance) in response to Hurricane Sandy in 2013.

Looking towards the future

While there is no one perfect financing option, there is clearly growing momentum and innovation towards financing natural infrastructure projects. Ultimately Canada, along with the rest of the world, will need diverse sources of funding to ensure the long-term viability and sustainability of NI projects as part of the mainstream. And let’s not forget the imperative to engage private and non-traditional players when it comes to funding these efforts. Cash-strapped governments cannot shoulder the financial responsibility alone.

Even so, we need to remember that planning and implementation of natural infrastructure for improved flood resilience are important and distinct steps. As we have seen, current programs are still focused on one or the other, with little effort to streamline and harmonize the transition to natural infrastructure towards improved resilience to natural disasters. Perhaps financing regional or watershed-based resilience including NI could be prioritized for flood-prone regions of Canada.

Nevertheless, current discourse suggests that while there is still much work to be done, the advancement of natural infrastructure as a viable means to address flood risks is on its way. ♣

This article originally appeared in the September/October 2019 edition of Water Canada.



Dimple Roy is the director of water management for the International Institute for Sustainable Development.

AECOM

IMAGINE IT. DELIVERED.

AECOM is committed to enhance the places where we work and live while creating and sustaining a world in which we all flourish. We apply creative vision, technical expertise, interdisciplinary insight and local experience to address complex challenges in new and better ways.

aecom.ca

Extensive, Collective Capabilities



Over 35 electric power and telecommunications infrastructure services, performed by 11 companies, all encompassed within the Valard Group of Companies.

We work with expert partners to seamlessly produce turnkey solutions for our clients.

Through a single contract and point of contact, we can, collectively, put together a full service team to successfully deliver every aspect of a project.

The Valard Group has decades of history building strong partnerships and relationships with diverse communities across the country. Our employees are part of the communities in which they work – supporting sustainability, local businesses and causes, as well as showing respect for project-related concerns and acting on them.

thevalardgroup.com



**The Valard Group
of Companies**

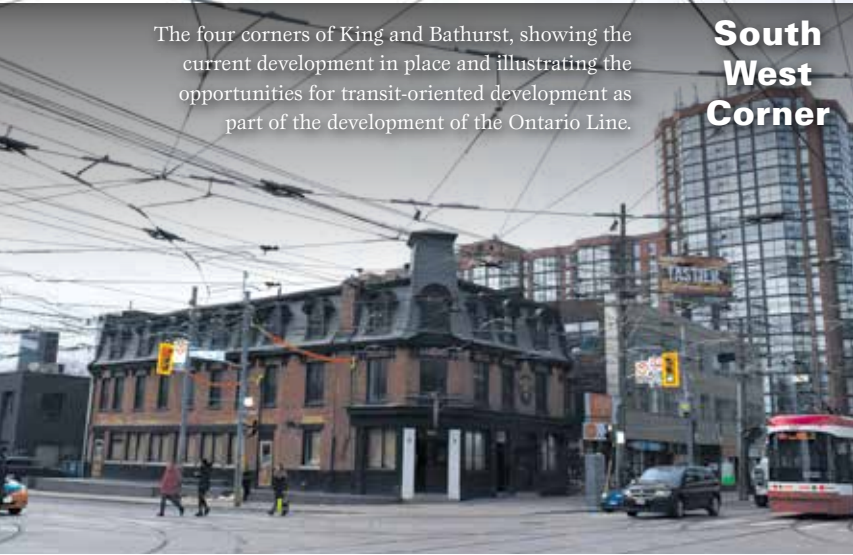


North West Corner

Photos: ReNew Canada



North East Corner



South West Corner

The four corners of King and Bathurst, showing the current development in place and illustrating the opportunities for transit-oriented development as part of the development of the Ontario Line.



South East Corner

BUILDING AROUND TRANSIT

Implementing transit-oriented development in existing urban cores.

By Andrew Macklin

In September 2019, Infrastructure Ontario President and CEO noted the need to focus on best practices for transit-oriented development (TOD) when building the new transit routes announced in the project pipeline.

Development around new transit stations is inevitable for obvious reasons, but directing development, ensuring development that complements the area and provides valuable resources for residents moving there, is another thing entirely. And directing that development when new stations are positioned in locations surrounded by greenfield properties is not remotely as difficult as doing so in existing urban cores.

With that in mind, we engaged Peter Paravalos, WSP’s director of transit-oriented development for rail/transit infrastructure in Canada, to take a closer look at two key intersections slated for new transit hubs, in order to appreciate the challenge ahead in implementing best practices for TOD. We focused on the proposed Ontario Line, the estimated \$10.1-billion subway project that will connect several transit routes throughout Toronto. The two intersections we looked at were Queen and Spadina, and King and Bathurst.

Before heading out, the two of us had a brief conversation to provide some context for the initial assessment of the area. He explained the three kinds of value indicators for consideration for transit-oriented development from a developer standpoint: node value, place value, and market value. Node value speaks to the transit that already exists, and whether or not the new transit system to be put in place has connectivity to any other form of transit. The place value speaks to where the location is relative to other important locations in the city. In the case of Queen/Spadina and King/Bathurst, the proximity to the downtown core creates significant place value. In terms of market value, it focuses on what can be put in that place; what types of development are permitted/needed in that location.

In the case of both intersections we focused on, as well as the Pape/Danforth location where the Ontario Line will connect to Line 2 of the subway system, all three ‘values’ are high for all three of the intersections.

Queen and Spadina

Paravalos and I stood on the southwest corner of Queen and Spadina and took a 360-degree view. Currently, the intersection features crossing streetcar lines (Spadina north/south, and Queen west/east), with two-to-three story buildings on each of the four corners. Currently, bank branches occupy the northeast and southwest corners, while fast food restaurants occupy the opposite corners.

One of the most important considerations in existing urban cores is heritage. When heritage buildings are in the immediate development area (generally considered a two-to-three block radius) that can have a significant impact on development, as the heritage considerations will limit the type of infrastructure can exist at that location. And in the case of the Queen and Spadina intersection, there are immediate heritage concerns to be addressed in regards to the buildings located on the northeast and southeast corners.

Looking towards the east, two heritage buildings that we have here, they're both historic structures," Paravalos said. "They're both around 1890, early 1900 buildings. They definitely have the potential to be worked into something."

But the historic elements for consideration don't end there.

"Also, the further east you go, you have more of this Queen Street historic feel, and putting anything that is going to be large in that area, you are going to get a lot of (resistance)."

As a result, the easiest buildings to redevelop, quickly, would be the northwest and southwest corners, as the current structures do not have historic value (Paravlos estimated the buildings had likely gone up in the 1970s) and thus could be replaced by buildings with higher densities.

Pedestrian accessibility

In order to "do TOD right", certain secondary considerations need to be taken into account. For Paravalos, one in particular stood out immediately.

"The primary thing is the priority of pedestrian, bicycle, and micro-mobility [...]; priority for those folks," he said. "The intersection would definitely need to be re-worked, especially with the influx of folks walking in this area."

There is also the question of where the station access points will be, and how exactly that access will be integrated into the existing infrastructure, as well as a reconfigured intersection. There is also a need to take into account where the emergency egress locations will be and how they will factor into an area that is densely packed with commercial properties at present.

Beyond the corners

Following the analysis of the immediate intersection, we took a look at the immediate area and the current amenities that already exist. Since it is likely that multiple corners of the existing intersection will be redeveloped with residential towers, it is important to

understand which amenities already exist in the neighbourhood. Any that are missing, or that are considered to be too far away based on the volume of people entering the area, should be integrated into the new development.

There is plenty of retail along Queen Street, both west and east, and a grocery store is located three-to-blocks west down Queen. North of the intersection is the entrance to Toronto's Chinatown, with lots of smaller fresh food markets. South of the intersection there are several coffee shops and fast food outlets, as well as a handful of professional services (dry cleaners, hair salons, dental offices etc.). There are elementary schools in the area, although neither of us was aware of their current capacity, so there could be an opportunity to build residential units to support young families.

One key amenity that we didn't see was a health clinic. If in fact there is not one in the immediate vicinity, one would be needed in order to support the additional residents added to the region. Also, green space is lacking in that immediate area already, so some sort of green space element will be need as part of the new development.

Overall, the intersection is able to support multiple residential towers, and the transit station would be best to be integrated into the framework of one or multiple of these buildings. At least one of the financial institutions should be re-introduced into one of the buildings, with a health clinic and perhaps a grocery store included in the development.

King and Bathurst

Moving west down the Ontario Line from Queen and Spadina, the next stop is slated for the intersection of King and Bathurst.

Paravalos and I took the 10-15 minute walk from one intersection to the next, noting existing amenities along the way to understand how they could impact the needs at King and Bathurst.

"It's not as complex, but certainly it is as confined (as Queen and Spadina)," Paravalos said. "You don't have much room for constructing something and keeping everything going at the same time."

The two intersections are different based on the density already in place within the immediate block in every direction. Unlike Queen and Spadina, whose density is low-rise commercial, there are already residential towers in place at King and Bathurst (see image on opposite page).

However, there are similar heritage constraints that must be factored in. At the intersection, three of the four buildings on the corners are buildings with significant

heritage considerations. But there is already development ongoing for more residential towers just off the immediate corners, both to the south on the west side of Bathurst, and east on the south side of King.

With the number of residential units already in place, and the work being done to develop more, the conversation quickly shift to amenities in the area. The immediate area has several green spaces with four park areas, including the Fort York National Historic Site, within four blocks of the intersection. There is a public elementary school within three blocks of the intersection as well, so young families could be attracted to the new developments at and around the intersection. Groceries can be found at a Loblaws that is located approximately four blocks away, but with the size of the residential influx happening in and around the intersection, another grocery option could be considered in one of the new developments.

With several thousands people likely to be added to the intersection in the next five-to-ten years, the needs could surround some basic professional services, such as walk-in health services, dentists, optometrists, and the like.

One of the discussions that came up, as it does in most conversations regarding housing in Toronto, is equitable and affordable housing. With the number of properties in the area that have development potential, certainly affordable housing units should be a consideration at or near the intersection.

"With development in an area as expensive as this, you're always having these issues with affordable housing and how you are going to pay for it," Paravalos said.

In order to make affordable housing an option in this situation, a government entity would have to step in to provide some funding. Otherwise it would not be likely that a developer could put together a business case that would allow for affordable housing units to be constructed and station or amenity interests integrated without losing money on the project.

With many moving parts to consider, building transit-oriented development that meets the needs of the residents in the immediate area, and well as the city as a whole, is no easy task. But with careful consideration and understanding of individual and community needs, developments can be built that will leave a lasting, long-term positive impact on the city. ♣

Andrew Macklin is the managing editor of ReNew Canada.



The Region of York chose bus rapid transit to run along the Highway 7 corridor, and transit-oriented development has followed the system's construction.

Inset: While carrying a similar physical footprint to bus rapid transit, the cost of rail systems and its associated infrastructure can create the need for significant additional investment.



Main photo credit: Blisdon; inset photo credit: City of Edmonton



BRT OR LRT

Which should you choose, and why? *By Bern Grush*

When Edward Glaeser described cities as “man’s greatest invention,” he surely included the technologies for moving people within those cities as integral. In fact, cities are formed—at least in their scope of breadth, height, and density—by the dominant form of mobility technology in then-current use. This was true for cities scaled by draught animals up until 1800. It remains true for today’s massive cities re-scaled by highways, elevators, and railways.

Preferred mobility systems varied over time. Urban scale was greatly magnified by rail and trolley in the 19th century and by the automobile in the 20th. As cities grew in height, diameter, and population, consequences included congestion, unyielding attachment to private vehicles, rising urban land values, and NIMBYism.

This combination of factors creates “wicked problems,” which spawn dozens of effects such as pollution, sprawl, climate change, mobility inequity, and built form that frustrates public infrastructure. Taken together, such a cluster of issues may occur as unsolvable, delaying resolution, and fomenting political feuds. This serves to worsen the original problem—hence “wicked.”

Caught up in this are cities deciding between BRT and LRT—a complex

process that may get reformulated several times. Even after a decision is announced, there are shifting ridership projections, budgets, development plans, rights-of-way, contractual arrangements, and changes in government. These put the decision in doubt and restart the deliberation.

What was the original question? The critical question regarding a BRT/LRT project is: “What are you trying achieve?” City building? Densification? Ridership growth? Reduced automobile use? Lower congestion within a corridor? GHG goals? Social equity? Sometimes the response is “yes” to all of these, but the trade-offs and uncertainty of those trade-offs trip up planners and politicians.

User perceptions

A majority of us state a preference for train-rides over bus-rides. This is usually based on assumptions of comfort, speed and status. While I share this perception of rail, my revealed preference is for a ride that arrives quickly, is always available, and stops very close to where I come or go. This means that I end up relying on the bus for most transit trips I take.

Rail has a storied history of long-distance service and romance. Bus has a very different history both in reality and in our perceptions. The cultural psychology around the words rail and bus influences how we

hear BRT and LRT in political promises and media stories. But consideration of such user or cultural preferences, however distorted, is not enough to fully inform a solution that addresses ridership demands, land-values, funding, social equity, or city-building potential.

System comparison. The 21st-century comparison of BRT vs. LRT is faint shadow of the sharp 20th-century dichotomy between bus and rail. Technology, costs, densities, and expectations have all changed. For systems that passengers would use daily for eight or ten kilometres, and at speeds of 25-30 km/h in an exclusive right-of-way with transit priority, both BRT and LRT can provide similarly short headways and comfortable rides. Schedules and station amenities can be made equivalent.

There is one critical difference: rail-based systems use longer cars and form longer trains to carry many more passengers with a single operator. This has three implications: capital expense, operating expense, and land value. Even these are highly variable and only directional.

Capital expense

LRT can be expected to cost more per-kilometre to build than BRT, although equally elaborate stations and dedicated rights-of-way can narrow much of this gap.

All things equal with regard to dedicated guideways, both would have similar land acquisition expenses.

Operating expense

Light rail transit can be expected to cost less to operate on a per-boarding basis—especially as passenger volume grows. The reason is partly labour costs (smaller, shorter BRT vehicles, each one requiring an operator) and partly that LRT vehicles are heavier and typically stay in service much longer. Even better, the incremental costs of adding off-peak service favours LRT over BRT. It is frequent off-peak service that makes transit more reliable than a predominantly commuter service.

Land value

Because of the higher peak capacity of rail vehicles, in the long run LRT potentially supports denser development, whether a steeper development curve or a longer development horizon. Land use around stations can generate higher per capita transit ridership and lower vehicle ownership. Lower ownership means more active transportation trips. It is often suggested that LRT stations

may be more likely than BRT stations to act as hubs for significant development. That, however, is more of a planning and rights-of-way issue than a direct property of rail. BRT projects like VivaNext in York indicate considerable TOD along its corridor.

All things equal, the more you wish to densify the corridor and the more passengers you want to move, the more you would favour LRT.

Automation

But all things are not equal. The missing variable here is mobility automation. If full-automation of non-rail vehicles becomes reliable (for which there is no dependable evidence) the operational expense of BRT drops to match or out-perform LRT operations. The wild card in the BRT-LRT conundrum is the 2030 calculation not the 2020 one. Far worse, if the regulatory, pricing, and service environment for automation in 2035 still favours private vehicle ownership, then falling ridership for either LRT or BRT will be disappointing. Hence, the decision to invest in either BRT or LRT implies the need to consider many future governance variables to defend that

investment. Will our political leaders have the courage and strategic foresight to do that? Again, there is scant evidence.

What to choose?

Conventional wisdom says LRT is superior to BRT, but recent evidence suggests that well-designed BRT is a sensible choice that serves its riders and the tax-paying public well. To this point, John Niles, at Mineta, emphasizes the more equitable option of raising the quality of all bus service incrementally with important, affordable service characteristics, rather than bearing the cost of full-featured, location-targeted BRT lines. This incremental approach of tactical transit improvement is now promoted as successful by the Transportation Research Board.

Everything depends on the original question. ✦



Bern Grush is the chief innovation officer at Harmonize Mobility Inc.

Comtech 

Collaborative Project Integrators

Over 25 years of excellence in providing scalable Program and Project Management, Engineering and Advisory services

 Comtech is proud to achieve Platinum status for ReNew Canada's Top100 Infrastructure Projects

www.teamcomtech.com

TRANSPORTATION & INFRASTRUCTURE | ENERGY & UTILITIES | INDUSTRIAL & MANUFACTURING | BUILDINGS & FACILITIES



Send us your best infrastructure image, and you may see it featured here. Email managing editor Andrew Macklin at andrew@actualmedia.ca for details.

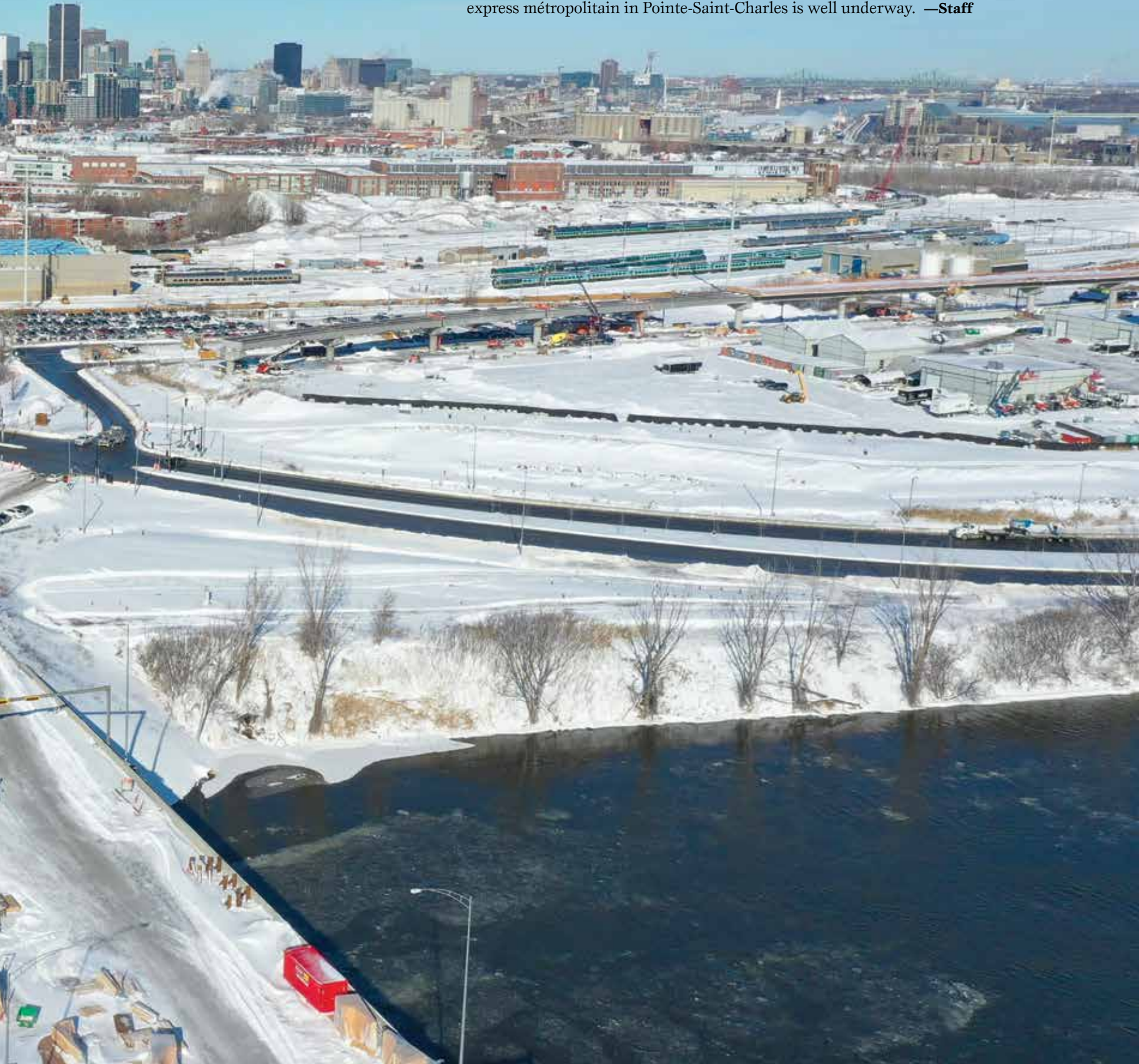
Credit: REM

**TOGETHER WE
BUILD SUCCESS.**



Rising Rails

South of the downtown Montreal skyline, aerial work on the Réseau express métropolitain in Pointe-Saint-Charles is well underway. —Staff



- **BUILDINGS**
- **CIVIL INFRASTRUCTURE**
- **HEAVY INDUSTRIAL**

We are more than builders. We are solution providers who are passionate about our partners' success and delivering Canada's top infrastructure projects.

Watch us build at PCL.com



Finsbury Circus in London. The public space in the middle was one of the many historic locations in the city that underwent a transformation as part of the ongoing Crossrail project.



OVERSEAS EXPERTISE

Learning lessons from London's Crossrail project. *By Andrew Macklin*

Sir Terry Morgan was named chairman of London's Crossrail in 2009, the 117-kilometre high-speed, high-frequency railway under development under the streets of London and beyond. During his more than nine years at the helm of England's most ambitious transit project, he learned numerous lessons in how to build, and as importantly, how not to build, transit megaprojects in major cities around the world.

During a recent trip to southern Ontario, we sat down with him to find out how his experience might help with transit development in Canada.

Before the construction began, the British government introduced the Crossrail Act? What barriers did that piece of legislation remove?

I heard reference that you haven't done that (in Canada). You end up with something that feels like everybody has an opinion. There are some that will be quite passive about change and there will be some who will be very vociferous around wanting no

change. And certainly NIMBYism is a very natural behaviour no matter where you go in the world.

The importance of what we did on Crossrail was to recognize that, to make sure that the project got started reasonably on time and had some pace behind it, you had to try and get a way of gathering all of the opposition voices against the program [...] and actually get commitments on how you were going to deal with it. And that got built in to hybrid legislation. A group of MPs were put together to run the process, so this was very much part of the public sector review. Some (suggestions) were rejected as being not value for money or unreasonable, and some (resulted in change).

Having gone through that legislative process, the program defined the route it was going to follow, it defined the way it was going to be built, and there were probably two thousand or three thousand conditions that were placed on the program. But it did what it had to do in order to satisfy the public debate about the program.

There is a recognition that, on mega infrastructure projects, the need to align, the concerns of the public that will be expressed through the politicians. That has to be put in a place that, at least demonstrates that you have given people the opportunity to express their views and that you have considered them.

On Crossrail, we employed a lot more people for stakeholder management than we ever thought was necessary. But in hindsight, we realized that it was absolutely the right thing to do.

But the hybrid legislation was so important to actually demonstrate that, when you're going to spend a huge amount of money that we weren't going to get stopped around issues that could have been resolved before we started.

You took a different approach to recruiting workers to help build the ambitious Crossrail project. What steps did you take fill the labour gap?

We took some learning from the 2012

Olympics and what they wanted to do to leave a legacy. As part of their contracts, they put in a condition that for every certain million pounds of contract value, you had to have an apprentice. To my mind, it's the first time that it was really attempted. It had some successes, but it was still something that was "we're not sure we really like this."

The best companies do it naturally anyways.

I got the public funding [...] to build a skills academy. And it's more a statement [...] about the intent behind the program that we were going to develop an apprenticeship program, and we were going to up-skill young people.

And then it grew. We had an ambition to have 400. We celebrated when we got to 400. And then the thing just kept going. Last time I checked, it was 1200...

There is a shortage of skills because there have been these cycles, boom and bust. And if you've gone through the cycle once or twice, you will say never again: I am not going to go through the bust again. So there is an importance of continuity. Wherever you go in the world, the infrastructure agenda is strong. And it is very clearly strong in Ontario.

From your perspective is there anything that you think is important to share with the global transit community in regards to what you learned from Crossrail?

This isn't a view that is shared by everybody because Crossrail is late: keep the government's arrangements.

I was never in any doubt that the chief exec of the Crossrail program was massive. There was a very clear leader.

There sometimes is a big picture out there that you have to keep focused around what is the angle about? What will the benefits be?

Create a compelling story that just makes it unstoppable. And so over the life of the (Crossrail) program, we were quite deliberate about it. We couldn't sustain a story about this new railway 10 years down the line because people get bored. So this whole thing around, the storybooks around skills, and up-skilling, architects and architecture, art, and the build; you have to build all of these stories. It keeps the interest high.

If you do it well, you don't threaten the politicians. You give them what they want. But you have to create the confidence, create the governance arrangements that allow people to get on and do their job.

We would have a board meeting and we would make a decision on spending, authorizing a bid process to commit half a billion pounds of expenditure. My commercial director couldn't wait to get out of the room to phone up the winning bidder. I just know that, in Canada, you make a decision in principle about who has won the bid and then you have to go away and get approvals for it. And then, surprise, surprise it might leak. And then, surprise, surprise, people start to work out how to frustrate the decision.

So this whole thing about trying to keep these procurement decisions quite simple is still a challenge for you guys.

We thank Sir Morgan for taking the time to sit down with us and provide us with his perspective. 🍀

Andrew Macklin is the managing editor of ReNew Canada.

Grant Headrick
1969 – 2020



In Memoriam

It is with great sadness that we mourn the passing of Grant Headrick.

Grant was a valued executive at DBRS Morningstar for more than 10 years and had a lasting impact on our company's success. He was a thoughtful and diligent analyst, a highly respected and engaged manager, and an even greater person.

Grant provided advice and analysis on some of the largest and most complicated infrastructure deals completed in Canada, the United States, and Europe.

He will be fondly remembered by all who knew him.



CLOUD STORAGE

Credit: B.C. Ministry of Transportation and Infrastructure



The Antlers Beach Wildfire,
July 18, 2018,
near Peachland, B.C.

The value of the cloud in infrastructure emergency management. *By David Hamilton*

It was the flood in 2017 that kickstarted GeoBC into moving their maps onto the cloud-based mapping platform, ArcGIS Online, but it was the wildfires that followed that proved the importance of the cloud infrastructure in a widespread emergency.

In the spring of 2017, Okanagan and Kalamalka Lakes, along with local rivers and streams, reached historic levels. The resulting floods caused millions of dollars in damage and lengthy evacuations of residents. Catastrophic wildfires followed shortly thereafter.

In what proved to be B.C.'s worst wildfire season ever, and for the first time in 14 years, the province declared a state of emergency on July 7. The state of emergency was extended four times, lasting 10 weeks, making it the longest state of emergency in the province's history. The total cost of wildfire suppression alone reached \$615 million and 1.2-million hectares of forest burned.

The disruption was huge. With 66 evacuation orders affecting 2,211 properties, 65,000 British Columbians were displaced from their homes.

Despite these numbers, it could have been worse. No lives were lost, and while the B.C. Government commissioned an independent strategic review identifying recommendations for future emergencies, it applauded the safe and successful wildfire response, saying it speaks to the professionalism of all agencies involved, along with the support and cooperation of the public.

Coordinating that response was a complicated undertaking, as was ensuring the public was well-informed. Residents had questions that needed to be answered: Where are the fires burning? Where are they forecasted to go? When do we need to evacuate? Which routes are still open? As the public was crying out for information, a top priority became reducing public frustrations and clarifying public safety messaging.

This was a colossal effort in collaboration, immediate access and real-time communication.

GeoBC's Portfolio Manager of Business Innovation and Emergency Response, Gurdeep Singh knew, with so many people

involved, he had to get the necessary location information into ArcGIS Online. He also understood that GeoBC—whose mandate is to create and manage geospatial information and products for the province—would benefit from cloud infrastructure. In fact, they already had.

“In the past, we created a lot of PDF maps that became outdated very quickly and could not keep up with the pace of events to provide timely and effective situational awareness.” Singh also notes that when using the cloud, “integration of data from multiple sources is easy, fast, and reliable.”

Months earlier, Singh's team had already started using ArcGIS Online to host data and mapping products, and it found how important that decision was when B.C. experienced severe flooding. The cloud structure also proved invaluable when the wildfires hit. As Singh says, “it's elastic and resides in the cloud, so that means a huge amount of horsepower is available to meet the growth in demand from users.” He had a lot of people wanting to collaborate

geospatially during this crisis and, “three to four hundred more users were added during the response with no problem”.

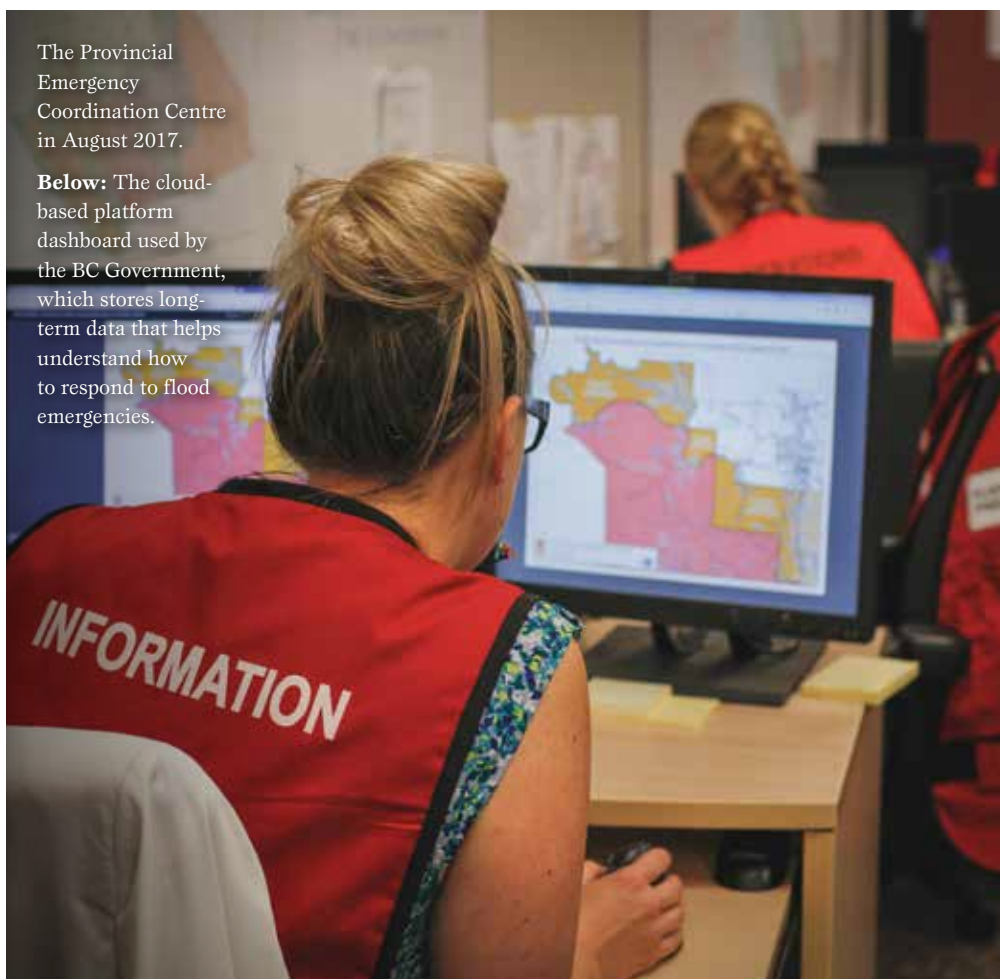
At peak activity, over 4,700 people were involved in fighting wildfires across B.C., including 2,000 contract personnel from the forest industry and over 1,200 personnel from outside the province. This support came from across Canada, as well as from Australia, New Zealand, Mexico, and the United States. Ground personnel from the Canadian Armed Forces were also brought in to fight fires for the first time since 2003. Thousands of people who had never worked together, many of whom didn’t even know the region very well, had to coordinate efforts.

With all the information in the cloud, Singh’s group could easily grant access to vital information to multiple levels of government (federal, provincial, First Nations, regional, and local), commercial and utility organizations and non-governmental organizations (NGOs) in a matter of minutes. The maps they provided were constantly being updated. “Web-based maps makes integration of other data much easier,” Singh says, which means that collaboration is much easier too.

Using web-based maps, an emergency management ‘common operating picture’ (COP) was developed. The COP allowed local governments and First Nations across the province to have shared situational awareness of the fires while still using their own data and tools. They all saw the value of sharing information among various levels of governments during an event, and the COP portal has since helped to establish standards, guidelines and best practices for sharing data, information and tools to support a common situational awareness during emergency events.

Ben Arril, Singh’s COP Lead at GeoBC, says “the COP, has become a centroid to our emergency GIS support system. It provides a reliable mechanism to convey spatial emergency information quickly to multiple incident command units and emergency management partners.” And a successful emergency response hinges upon government agencies’ ability to make timely decisions on resource allocation.

When the crisis passed, B.C. Liberal MLA George Abbott and First Nations Chief Maureen Chapman co-chaired the strategic review of the province’s response. After touring damaged areas and meeting with those affected by the floods and fires, they recommended the province establish Emergency Centres of Excellence in interior locations and build a hub website for emergency communications. “2017 was not a one-off and something that will go away, it



The Provincial Emergency Coordination Centre in August 2017.

Below: The cloud-based platform dashboard used by the BC Government, which stores long-term data that helps understand how to respond to flood emergencies.



is something we have to think of not just for 2018 but for every day in the future as far as we can look ahead,” said Abbott.

Abbott and Chapman’s report also recommended strengthening public understanding of the risks and personal responsibilities associated with living in a fire-dependent ecosystem. In response, Emergency Management B.C. launched EmergencyMapBC, a powerful tool to keep the public informed and safe by serving as a general reference for current public safety conditions during emergencies.

Creating safer, less vulnerable communities in ‘the new normal’ of increased wildfires requires a modern approach to understanding threats and hazards that are more complex, costly and devastating than ever before. Agencies around the world rely

on cloud computing every day to plan for and mitigate complex threats and hazards and coordinate response and recovery efforts when disasters and emergencies occur.

As more areas across Canada face extreme weather—Hurricane Dorian required Nova Scotia Power to coordinate a variety of emergency responders from outside the province—the necessity of immediate collaboration will become not a matter of ‘someday’ moving vital infrastructure data to the cloud, but how to start doing it today. 🍀



David Hamilton is the Public Safety Industry Manager for Esri Canada.

Specifying Certification is a Critical Part of The National Building Code

Which is Even More Important Now in an Age of Climate Change

Climate change has already had far-reaching impacts on our above and below ground infrastructure and can put its performance and reliability at risk. This trend is likely to accelerate in the coming decades. The main threats to infrastructure assets are many but include first and foremost damage or destruction caused by extreme weather events. These threats have led to Infrastructure Canada's Climate-Resilient Buildings and Core Public Infrastructure Initiative. Led by the National Research Council of Canada (NRC) this "ground-breaking work focuses on integrating climate resiliency into building and infrastructure design, guides, certification and codes." (infrastructure.gc.ca/plan/crbcp-ircipb-eng.html)

According to Infrastructure Canada "this initiative is intended to develop capacity in Canada's construction industries to adapt to the increasing demands on our built infrastructure attributed to climate change. It is driving innovation and providing partners with the science-based knowledge and tools they need to make sound decisions about how to design, operate, and maintain their infrastructure assets. This supports Infrastructure Canada's commitment to outcome-based programming.

The work undertaken by the NRC and the Canadian Construction Industries will contribute to an infrastructure landscape that can keep Canadian communities safer from extreme weather and the effects of climate change".

Certification means that an independent third-party organization has reviewed the manufacturing process of a product and determined that the final product complies with National safety, quality and performance standards.

The general public relies on professionals to design and build structures that are safe, not only during construction, but throughout service life and even during deconstruction. In the age of climate change this is more essential than ever before. To remain vital in the face of coming climate change challenges, the construction industry will need better, safer, more durable and longer-lasting construction materials that can maintain or improve lifespan expectations for buildings and core infrastructure.

How do we ensure a structure is built with products in accordance with National standards? The answer is certification and Quality Assurance. Quality Assurance applies to the production process and ensuring

that all safety and quality standards are met for a particular product, and can extend to aesthetics, durability, and performance. These are vital components to building a safe structure.

When it comes to purchasing certified building and above and below ground infrastructure products, value comprises a system that provides the right durability and resilience to safely and sufficiently service needs for its entire lifecycle. So how do you as an owner, agency, or specifier achieve good value for your investment?

We know that specifying products that meet the right building code standard is a minimum first step.

Specifying products that meet a certification program built on superior quality assurance processes and results, above and beyond the minimum building code standards, is a wise and value-adding step to protect your investment, manage risk, and provide safety assurance to your end users, tax payers, and/or service community.

Precast Concrete Certification Background

In late 2017, Canada's two leading precast concrete associations, the Canadian Precast/Prestressed



Concrete Institute (CPCI) and the Canadian Concrete Pipe and Precast Association (CCPPA) announced a new joint venture to establish an independent entity for administering, enhancing and expanding a third-party certification program for prestressed and non-prestressed precast concrete manufacturing facilities across Canada.

CPCI and CCPPA recognized the benefit for owners, contractors, and the precast concrete industry by combining the strengths of two well-established plant certification programs, CPCI Certification Program for Structural, Architectural and Specialty Products and Production Processes (CPCI Certification) and the Plant Prequalification Program for Precast Concrete Drainage Products (PPP), into the new Canadian Precast Concrete Quality Assurance (CPCQA) Certification Program.

The CPCQA Certification Program is an impartially-operated, not-for-profit corporation, governed by its own Board of Directors, advised by a new multi-stakeholder Quality Assurance Council (QAC), and managed by an independent Managing Director.

The Accredited Certification Organization (ACO)—engineering firms contracted to provide the plant auditing services reports directly to the QAC, which is a diverse group comprised of representatives from provincial and municipal levels of government, consulting and architectural firms, precast concrete manufacturers, and other industry experts.

Why Certification?

Communities rely on construction professionals to design and build infrastructure systems that are safe and durable throughout the system's service life. The systems must be built and must perform as designed. Otherwise

safety, along with the probability of a construction project's success, can be adversely affected. Knowing that there is always some degree of risk associated with any project, the key aspect of lowering that risk is through quality assurance.

Why the CPCQA?

Here are just a few of the many ways owners have indicated that specifying CPCQA supports their goal of delivering top value for their project dollar:

CPCQA Fundamentals for Structural/Architectural Precast Plants

The national and provincial building codes require conformance to the standard CSA A23.4 for precast concrete materials and construction when it comes to structural and architectural precast concrete.

CPCQA is a nationally recognized and accepted certification program that provides an independent third-party certification of conformance to the CSA A23.4 standard.

The CPCQA certification program requires precast concrete manufacturers to meet the requirements of the latest editions of CSA Standard A23.4 and the PCI Quality Control Manuals MNL-116 and 117 (US equivalent), with the more stringent requirements being the governing criteria.

Manufacturers are audited to all the requirements in CSA A23.4, as well as the applicable material and production requirements in CSA A23.1 and CSA A23.2 that apply to precast concrete.

Certified plants are **audited annually with at least two unannounced** audits. Strict compliance with published standards is necessary to maintain certification. Certification confirms a manufacturer's capability to produce quality products and systems.

AT PRESENT THE CANADIAN PRECAST CONCRETE QUALITY ASSURANCE PROGRAM (CPCQA) CERTIFIES OVER 80% OF THE PRECAST CONCRETE PRODUCTION IN CANADA.

THE CANADIAN PRECAST CONCRETE QUALITY ASSURANCE PROGRAM



(CPCQA) IS ENDORSED BY CANADIAN PRECAST/PRESTRESSED CONCRETE INSTITUTE (CPCI) AND CANADIAN CONCRETE PIPE AND PRECAST ASSOCIATION (CCPPA) IS THE ONLY CERTIFICATION PROGRAM IN CANADA THAT HAS AN OFFICIAL QUALITY ASSURANCE REPORTING PROGRAM AND QUALITY CONFLICT RESOLUTION MECHANISM.

Brian J Hall, B. B. A., MBA

**Managing Director,
Canadian Precast Prestressed
Concrete Institute**

**Vice Chair, Royal Architectural
Institute of Canada Foundation**

**To download the full
technical publication,
go to bit.ly/CPCQA2019**

**For more information, visit
precastcertification.ca**



**(CPCQA) CANADIAN
PRECAST CONCRETE
QUALITY ASSURANCE
CERTIFICATION PROGRAM**

CLIMATE ACTION



Targeted clean investments can make significant impacts on the decarbonisation of the infrastructure sector.

A Capital Plan for Clean Prosperity. *By Toby Heaps, Laura Väyrynen and Aleena Naseem*

If there's one element of the 2019 federal election campaign we can take heart in, it was the centrality of the climate crisis. After years of climate change being left out of official debates, it was, at long last, extensively debated, and Canadians were asked to choose among a range of climate plans that differ greatly in terms of sense of urgency and stringency.

Most Canadians understand that climate action and economic prosperity aren't a zero-sum or either/or proposition. But the scope of the economic opportunity that's embedded in climate action is still widely underestimated. So Corporate Knights has attached dollar values to that opportunity, based on an assessment of five major sectors: buildings, transportation, electricity, heavy industry, and oil & gas. In each, we quantified the likely level of business-as-usual capital investment in the six-year period from 2020 through 2025. We then quantified the incremental clean investment (ICI) that would be required to turbocharge demand for viable decarbonization options in sectors with the greatest greenhouse gas emissions.

Under the logic of "what gets funded gets done," we propose a six-year time-bound clean stimulus program to cover the lion's

share of the incremental clean investment, estimated at two per cent of GDP per year. The war chest to provide the clean stimulus could be most logically financed via a Canada green bond borrowing program averaging just under \$50 billion per year over the next six years. To put this number in context, Scotiabank's economists are calling on the federal government to undertake up to a \$100 billion per year stimulus program to counteract the coming economic contraction. Directing half this amount toward a clean stimulus is ambitious and aspirational yet realistic.

We would expect a modest increase in Canada's debt-to-GDP ratio, which could be mitigated by incremental tax revenues resulting from additional GDP growth that the stimulus would spur. This stimulus package would drive demand at scale to deploy a host of decarbonization technologies economy-wide, with significant knock-on effects including hundreds of billion of dollars of GDP growth and hundreds of thousands of new jobs, not to mention getting us 70 per cent of the way to our 2030 Paris targets for carbon emissions reductions by the end of 2025. It would also place Canadian industry at the forefront of a large growing global market for low-carbon solutions.

The Capital Plan for Clean Prosperity demonstrates that transitioning to a low-carbon economy is less about "shutting down" than it is about retooling, diversifying, and growing, especially in the oil sector, which offers the biggest carbon-savings bang for buck, and where production costs per barrel will be critical to remaining competitive. The benefits of doing so can be remarkable. You can read a summary below, and you'll find more details at corporateknights.com.

The time for baby steps has passed. A targeted clean stimulus of this magnitude will bring about rapid economic growth and realistic greenhouse gas reductions that Canadians of all political stripes can get behind. ♣



Toby Heaps is the publisher of Corporate Knights. Laura Väyrynen is a research analyst at Corporate Knights. Aleena Naseem (not pictured) is a former writer with Corporate Knights.

Jobs and GDP Growth in Five Major Sectors

Decarbonization Policies on Which Potential Incremental Green Investment (IGI) Is Based (2020–2025 inclusive)

Sector	Key Policies Driving IGI	Annual Potential GHG Reductions by 2025 ¹
Transportation	<ul style="list-style-type: none"> Adopting Quebec's zero-emission vehicle (ZEV) sales quota \$500m public stimulus to expand the electric vehicle charging network nationwide \$14b to cover the incremental costs of the private sector to purchase ZEV freight trucks \$2.5b to cover the incremental costs for purchasing ZEV public transit buses \$23b to close the transit funding gap 	22 million tonnes
Electricity	<ul style="list-style-type: none"> Moving the coal phase-out deadline up to 2025 from 2030 \$132b of public stimulus to cover the incremental cost of constructing interprovincial HVDC power lines 	48 million tonnes
Heavy Industry	<ul style="list-style-type: none"> \$17b of public stimulus to cover the cost of making 50% of heavy industry plants 50% more energy/GHG efficient 	22 million tonnes
Oil & Gas	<ul style="list-style-type: none"> \$21b of public stimulus to cover the cost of making 30% of oil and gas operations 50% more energy/GHG efficient 	30 million tonnes
Buildings ²	<ul style="list-style-type: none"> \$78b of public stimulus targeted at developers and contractors to retrofit and flood-proof homes and construct zero-carbon buildings 	17 million tonnes

Potential Incremental Clean Investment and Benefits by Sector (2020–2025 inclusive)

Sector	Projected Business-as-Usual Investment (\$B)	Potential Incremental Clean Investment (ICI) ³ (\$B)	Benefits Associated with IGI	Increased GDP ⁴ (\$B)	Jobs Created x 1,000	Direct Savings ⁵ (\$B)
Transportation	752	45	→	47-87	82-257	64
Electricity	154	132	→	145-264	122-396	25
Heavy Industry	211	17	→	13	20	16
Oil & Gas	173	21	→	21-22	16-35	10
Buildings ⁶	795	78	→	81-314	154-183	36
TOTAL	2,085	293	→	308-699	395-891	151

1) Additional to Government of Canada Projections (Reference Case); 2) Residential and commercial buildings combined; 3) Driven by clean stimulus program; 4) The wide range for the GDP estimate results from application of multipliers with varying degrees of conservatism. Results should be interpreted as indicative. Actual results will vary depending on slack in the economy, interplay with demand in other sectors, exchange rates and the degree to which machinery and equipment are sourced from Canada; 5) Resulting from reduced energy costs; 6) Residential and commercial buildings combined.

Note: Numbers may not add up exactly due to rounding.

Source: Corporate Knights

Recognizing that mental health is a concern in the industry helps remove the stigma and allow employers to begin to address the issue.



HEAD CHECK

Addressing mental health in construction. *By Andrew Pariser*

It's 2020: the start of a new year and new decade. And it's time we do something about mental health in construction. The industry knows it is an issue; the industry supports events and campaigns including Bell Let's Talk, and the industry has the foundations in place to make a difference in workers lives.

Simply put, everyone agrees that mental health is an important issue and the questions moving forward are: "Now what? How do we make a difference?"

That was the focus of RESCON's first mental health symposium, which brought together 115 industry representatives who packed a venue in Vaughan, Ont., to hear from government and construction experts on the importance of understanding and addressing mental health in the workplace. A lot of heads were nodding in the crowd. As far as I am concerned, this event and discussion were long overdue.

If a worker sustains a physical injury, we all know what to do. We get the first aid kit, we provide comfort, we call an ambulance or family member, we provide support.

So why don't we treat mental illness the same way?

Mental illness affects people of all ages, education, income levels, and cultures. This includes those employed in construction and those who are connected to this industry.

Consider this statistic: one in five people in Canada will personally experience a mental health problem or illness, according to the Canadian Mental Health Association (CMHA). When you consider that we

have more than 1.3 million construction workers across this country, according to Statistics Canada's 2016 figures, that would mean mental illness affects at least 260,000 workers.

Our association's health and safety committee has identified mental health as a leading issue, and we have the goal of improving awareness, facilitating discussion, destigmatizing mental health and addictions, and taking a leadership position moving forward.

Ontario is fortunate to have an Associate Minister of Mental Health and Addictions, Michael Tibollo, who understands this well and genuinely cares about this issue. He has been a mental health advocate for 40 years.

"About 500,000 people are not going to work every week because of a mental health issue," Tibollo said. "The stigma needs to end. We need to be sure that people who are suffering are able to talk about it and seek the help they need. None of you would stay away from a hospital or seek help if your leg was broken, so why is it that we don't seek help when we need to talk to someone?"

Tibollo said that prevention and intervention are the keys to solving the mental health and addictions crisis. He said spending \$1 on prevention and education is equivalent to spending \$21 after people recover from a crisis.

Ron Kelusky, Ontario's chief prevention officer for the Ministry of Labour, Training and Skills Development, offered solutions and next steps for employers interested in improving the mental health culture in their workplaces.

Suggestions included:

- Creating a very safe and non-threatening culture in your company.
- Adding flexibility to benefits plans.
- Eliminating the stigma.
- If you see bullying happen, stop it.
- Mental Health is a continuum. It is all connected and not binary. The idea that people are either healthy or sick is a myth as individuals move along the mental health spectrum.

There are different root causes that can trigger mental health issues in construction workers.

"On a construction site, you can have a normal situation where it's a compounding, complex, physiological, psychological issue of an employee that results in a mental health situation. Or there could be a traumatic event that is witnessed that can cause it as well," Kelusky said.

The biggest challenge for employers dealing with employees in crisis was the return-to-work stage.

"Many of the human resource programs and policies that are existing within organizations are geared to the physical return-to-work process. And it is completely different when it comes to mental health."

But there is hope, he added.

"Studies have found that if someone experiences a severe mental health disorder, such as PTSD (post-traumatic stress disorder), there's a likelihood of about 85 per cent that they will come back to work as a very productive employee.

“However, you need to provide proper support, treatment, and assistance throughout the process. Mistakes in how mental health injuries are dealt with lead to a higher likelihood that you will lose that employee forever.”

Finally, the event featured a panel which brought together leading resources that employers should know about and can utilize when creating mental health strategies.

Matthew Porter of BPA Financial Group highlighted features of the LiUNA, Local 183 Health and Wellness Fund, which is jointly trusted by labour and management representatives and has recently added mental health benefits. Recently launched, these benefits include:

- 1 A new LiUNAcare website and mobile app.
- 2 A Quickcare confidential mental health program.
- 3 Access to clinical psychologists, psychotherapists and occupational therapists.

These benefits are available to all members of the LiUNA, Local 183 plan and are among the top benefits offered to employees in any industry.

Chanda Chandalala, a crisis support worker for the CMHA, provided an overview of the extensive services, research and information CMHA provides, including workshops with high schools as well as specialized programs for immigrants and refugees. As a leading organization in the field of mental health, CMHA is a key resource for all employers and offers crisis services through its main phone line and website.

The bottom line is this: employers are not alone as numerous resources are available to assist the creation of policy, programs and mental health benefits.

This event represents the start of RESCON’s efforts. We look forward to making this an annual event and supporting employers’ efforts as they build programs and policies and implement meaningful change at the employee level.

We look forward to taking more of a leadership role this year by improving awareness, promoting discussion, and destigmatizing mental health and addictions on site. ✨



Andrew Pariser is the vice president of RESCON.



Trenchless Watermain Rehabilitation

Reliable, Sustainable, and Practical.

Clean Drinking Water Solutions



BEFORE



AFTER





FER-PAL provides communities like yours with clean water using technologies that reduce infrastructure risk and maintain services.

MINIMIZES IMPACT TO TRAFFIC, BUSINESSES, AND RESIDENTS

LOWERS GREENHOUSE GASES

REDUCED COST VERSUS TRADITIONAL OPEN CUT CONSTRUCTION








Watch our videos and learn more about us and our projects at

ferpalinfrastructure.com



Canadian Environmental & Engineering Executives Conference

SEP. 30 - OCT. 2, 2020
 Simon Fraser University
 Wosk Centre for Dialogue
 Vancouver, B.C.





High value keynote speakers and panelists in conversations of vital interest to you and your peers:

- MERGERS & ACQUISITIONS - OWNERSHIP TRANSITION
- INDUSTRY SURVEY RESULTS & BENCHMARKING
- CYBERSECURITY & DIGITAL EVOLUTION
- LEADERSHIP AND DIVERSITY
- STRATEGIC BUSINESS CHALLENGES
- CORPORATE RISK MANAGEMENT WORKSHOP

CE3C is an exclusive event for corporate executives in the consulting and engineering community to meet, network, and discuss key issues facing the sectors they operate in and serve.

As the only Canadian conference specifically tailored for environment and engineering executives, we invite you to join the 2020 CE3C cohort and be part of this premier gathering of leadership teams from across Canada.

DETAILS AND REGISTRATION AT CE3C.CA

Credit: Bruce Power



Top100
Canada's Biggest
Infrastructure Projects

For additional details
on this year's
Top100 report, visit
top100projects.ca

Bruce Power begins Major Component Replacement Unit 6 project

2020 Top100 Projects Rank: 2
Value: \$13 billion

Four years after the start of its Life-Extension Program, Bruce Power is beginning the execution phase of its first Major Component Replacement (MCR) project.

The operations team at the Bruce B nuclear generating station completed the rundown sequence for Unit 6 and took the unit offline. Between now and 2033, Units 3-8 will be upgraded during MCR, replacing the reactor components to extend the life of those units, and the Bruce Power site, to 2064.

“The Unit 6 project marks the next big step in a long campaign to revitalize this

site,” said Mike Rencheck, president and CEO. “It has taken commitment, focus, and innovation to get us to this point, and on behalf of our board of directors and the senior leadership team, thank you to everyone who has contributed to the MCR planning process.

“Our employees, supplier partners, and skilled tradespeople participating in this project are ready for the journey ahead, and I look forward to delivering our plan and securing our future.”

Expanding the life of the Bruce Power site

until 2064 will result in an annual injection of \$4 billion into Ontario’s economy while creating and sustaining 22,000 jobs across the province each year. The company will continue to safely provide clean, affordable, reliable power and life-saving medical isotopes while strengthening local communities and protecting the environment.

“With Unit 6 offline, we have reached a pivotal moment in Bruce Power’s history,” Rencheck said. “We are focused on doing our work safely, to the highest standard, on time, and on budget.” ✨

Credit: B. C. Ministry of Transportation



Preferred proponent selected for Pattullo Bridge replacement

2020 Top100 Projects Rank: 44
Value: \$1.377 billion

Fraser Crossing Partners has been named as the successful proponent for the \$1.377-billion Pattullo Bridge replacement project in British Columbia.

Fraser Crossing Partners consists of:

- **Proponent:** Acciona Infrastructure Canada Inc. and Aecon Group Inc.
- **Design-build contractor:** Acciona Infrastructure Canada Inc. and Aecon Constructors
- **Long-span bridge design contractor:** SNC-Lavalin Inc., Leonhardt, Andrä und Partner Beratende Ingenieure VBI AG,

Hatch Corporation, EXP Services Inc. and Acciona Infrastructure Canada Inc.

The consortium was one of three that had been named in September 2019 as part of the revised list of those eligible to participate in the Request for Proposals stage of the bid.

“Aecon looks forward to playing an important role in connecting the communities of New Westminster, Surrey and the surrounding area,” said Jean-Louis Servranckx, president and chief executive officer of Aecon Group Inc.

The new bridge will replace the existing connection between the two communities

with a four-lane span that features wider lanes, with improved connections to transportation nodes on both sides. The new bridge will also include separated cyclist and pedestrian lanes.

The design-build project will also be subject to the province’s Community Benefits Agreement, which will provide new training opportunities for people in the local areas around the construction site.

Financial close is expected to be reached in the first quarter of 2020. The bridge is slated to open in 2023. ✨



Asset Management
**ROCK
SOLID!**

CNAM Conference 2020
St. John's, Newfoundland
May 11-14

CNAM Conference 2020

**St. John's Newfoundland
May 11-14**

The Canadian Network of Asset Managers is hosting its 14th Annual Conference in St. John's, Newfoundland - one of North America's oldest and colourfully vibrant cities.

The annual conference, trade show, and the student symposium will be exploring and addressing the many challenges that asset managers face in our communities.

**REGISTER
NOW!**

**BOOK YOUR
ACCOMMODATION NOW!**

Contact us today for sponsorship and exhibit opportunities!



Top100

Canada's Biggest Infrastructure Projects

KEY PLAYERS AND OWNERS DINNER

CELEBRATING THE BIGGEST INFRASTRUCTURE PROJECTS IN CANADA

On February 18, senior executives from throughout the Canadian public sector infrastructure landscape came together at The Carlu in downtown Toronto to celebrate more than \$240 billion in infrastructure megaproject development.

Ontario Minister of Infrastructure **Laurie Scott** provided keynote remarks at the annual event, telling the audience about the progress being made on the robust pipeline of projects being delivered in the province. Federal Minister of Infrastructure

and Communities **Catherine McKenna**, unable to attend the event due to committee meetings in Ottawa, delivered a message via video that outlined her priorities for infrastructure development in Canada over the course of her mandate.

This year's keynote panel discussion focused on infrastructure through the climate lens, discussing the environmental and climate considerations that need to be applied to new asset development. The panel featured Mayor of Kitchener **Berry Urbanovic**, City of Toronto Ward 19

Councillor **Brad Bradford**, Healthy City Global Co-founder **Marianne Lefever**, and Colliers Project Leaders Chief Development Officer **Olivia MacAngus**.

Work is now underway to develop the 2021 edition of the Top100 Projects report. Project and stakeholder submissions are being accepted now. If you would like to supply us with information for consideration for the report, please email ReNew Canada Managing Editor Andrew Macklin at andrew@actualmedia.ca. 🍁

TOP100PROJECTS.CA/CELEBRATE

RENEW CANADA WOULD LIKE TO THANK OUR PARTNERS AND ALL THE ATTENDEES WHO MADE THE EVENING A SUCCESS!

2020 SPONSORS

PREMIER PARTNER



ELITE PARTNERS



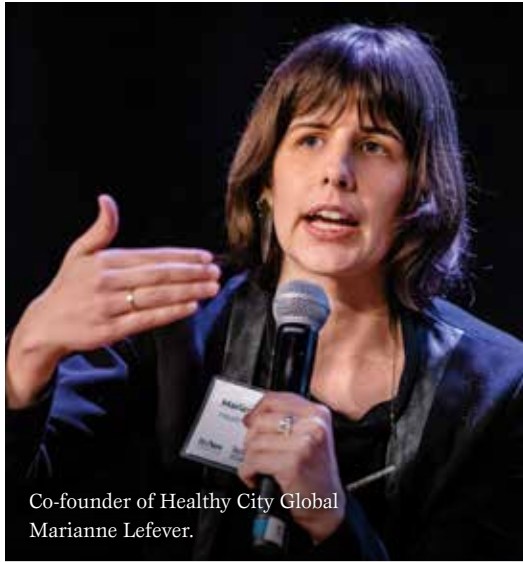
SELECT PARTNERS



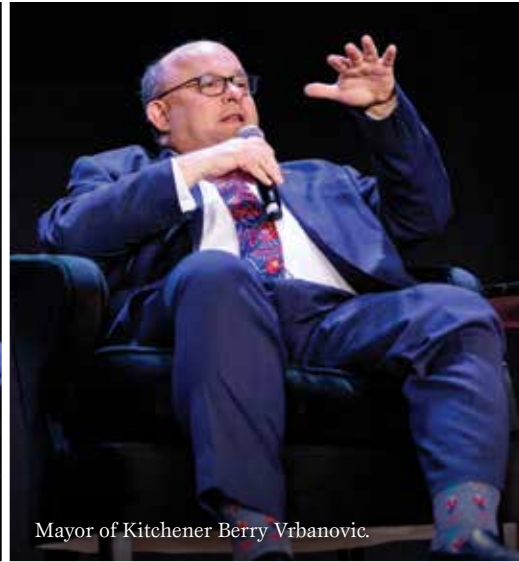
CHOICE PARTNERS



AI Photos: Josh Fera



Co-founder of Healthy City Global Marianne Lefever.



Mayor of Kitchener Berry Vrbanovic.



Colliers Project Leaders chief development officer Olivia MacAngus.



Federal Minister of Infrastructure and Communities Catherine McKenna provided keynote remarks from Ottawa.



City of Toronto Ward 19 councillor Brad Bradford.



Ontario Minister of Infrastructure Laurie Scott.



The team from Wood at the 2020 event.



Actual Media president and CEO Todd Latham shared a story with Morrison Hershfield vice president of business development Loui Pappas and geotechnical engineering technologist Darrin Sellick from Golder.



WSP president and CEO Ryan Brain.



Walter Gaudet, senior vice president and buildings + places regional business line leader for Canada for AECOM shares a laugh with a few colleagues.



Morrison Hershfield president and CEO Anthony Karakatsanis and WSP president and CEO Ryan Brain engaged in a discussion.



Hatch senior project manager Ellie Moradinezhad with EXP executive vice president of major projects Reece Bailey.



A full house of 300 guests at the 2020 Key Players and Owners Dinner.



Executives from Comtech taking in the festivities at the 2020 Top100 Projects dinner.



Nice to see you! Canadian Council for Aboriginal Business chief operating officer Tabatha Bull says hello to Canada Infrastructure Bank director of corporate communications Terence Foran.



Arup senior civil engineer Peter Preston alongside Global Public Affairs vice president John Allen and fellow Arup senior civil engineer Charles Ormsby.



Colliers Project Leaders' Olivia MacAngus in conversation with WSP business line executive, transportation Eric Peissel and Infrastructure Ontario's president of project delivery Michael Lindsay.

AI Photos: Josh Fera



Afsoon Soudi, Tibor Turi, Baijul Shukla, and Angela Wojtyla from the Ontario Society of Professional Engineers.



Ontario Chamber of Commerce president and CEO Rocco Rossi talks with Ontario NDP MPP and infrastructure critic Jennifer French.



Among the VIPs at the 2020 event were: (back row, left to right) Minister Scott, Ontario Minister of Labour Monte McNaughton, Canada Infrastructure Bank group head of corporate affairs, policy and communications David Morley, ReNew Canada's Macklin, Canadian Council for Public-Private Partnership Executive Director Mark Romoff, (front row, left to row) Colliers' MacAngus, MPP French, Health City Global's Lefever and Director of Policy and Legal Affairs for the Office of the Minister of Infrastructure and Communities Claire Seaborn.



Metrolinx President and CEO Phil Verster, seen here shaking hands with a colleague, is one of the many VIPs who attended the 2020 Top100 Projects Dinner.



Golder's marketing specialist for NA infrastructure & power sector Kendra Mulhern with colleague and environmental assessment specialist/planner Sarah Schmied.



DBRS Morningstar's vice chairman Doug Turnbull.



Ontario Minister of Infrastructure Laurie Scott visits with senior vice president, Canada transportation business line leader at AECOM Bruce McCuaig and AECOM senior vice president, Canada Water Ian Dyck.



John Pinsent, CAO of the Township of Ramara with EXP senior manager Scott Passmore.

Top100

Canada's Biggest Infrastructure Projects

KEY PLAYERS AND OWNERS DINNER

CELEBRATING THE BIGGEST INFRASTRUCTURE PROJECTS IN CANADA

SEE YOU NEXT YEAR!

FEB. 16, 2021

Plan your presence at the 2021 Top100 Projects Dinner by contacting Nick Krukowski 416-444-5842 ext. 101 nick@actualmedia.ca

TOP100PROJECTS.CA/CELEBRATE

APPOINTED



Ehren Cory

Infrastructure Ontario President and CEO **Ehren Cory** announced that he will extend his current role by a few months, giving officials enough time to find a suitable replacement.

Cory has spent three years in his current role, which was set to expire in February 2020. However, he has agreed to extend his stay until the end of April in order to provide stability in the organization while the search for his replacement is conducted.

Prior to joining Infrastructure Ontario as its executive vice president of transaction structuring, Cory was a partner at McKinsey and Company.



Bruce Ralston

Bruce Ralston has been appointed as the Minister of Energy, Mines and Petroleum Resources.

Ralston is in his fourth term serving as the MLA for the riding of Surrey-Whalley, having first been elected in 2005.

Ralston had previously served as the Minister of Jobs, Economic Development and Competitiveness. He swapped roles with **Michelle Mungall**, the MLA for Nelson-Creston, in a minor cabinet shuffle announced by Premier **John Horgan** on January 22.



Gregor Robertson

Former Mayor of Vancouver **Gregor Robertson** has taken the role of executive vice president of strategy and partnerships at Nexii Building Solutions.

“We are at a critical time for restoring our environment,” said Robertson. “Buildings are the largest source of climate pollution. That’s why when Nexii—the creators of new breakthrough green building technologies—asked me to join their team, I didn’t hesitate. I’m proud to be part of a Canadian company with significant potential

to make a huge positive impact on the environment and communities globally.”

Nexii has developed solutions with the potential to both reduce the construction sector’s impact on the environment and help tackle the global housing shortage. Nexii’s proprietary building material, Nexiite, facilitates the rapid construction of sustainable, cost-efficient, durable, and disaster-resilient buildings.



Joe Tiernay

The Ontario Good Roads Association board (OGRA) of directors announces the pending retirement of OGRA’s Executive Director **Joe Tiernay** effective July 31, 2020.

OGRA was fortunate to have Tiernay join the OGRA in 2005 as executive director, following a successful 25-year career that included work for several Ontario municipalities and five years as the executive director of the International Institute of Municipal Clerks. Over the past 15 years, he’s grown OGRA into a strong voice for the municipal sector and positioned OGRA as an industry leader in advocacy, training, and services for safer roads and infrastructure.

“It has been a true pleasure working with Joe and we wish him much happiness in his retirement years,” said OGRA President **Rick Kester**. “We look forward to seeing Joe at future OGRA events and meetings. We know Joe will be kept busy by his family, travels and his passion for music.”

The board of directors has begun the process to find Tiernay’s replacement.



Elliott Cappell

Elliott Cappell has joined WSP Canada as its director of climate change.

Cappell brings over 10 years of experience leading challenging climate resilience and

city infrastructure projects with international organizations including the World Bank, United Nations Development Programme, the Climate Development Knowledge Network, and the International Climate Fund.

Prior to joining WSP, he was the chief resilience officer for the City of Toronto, spearheading the development of Toronto’s first Resilience Strategy, which integrates climate risks and opportunities to city strategic policy, governance, decision-making, and risk management.



Stewart Kyle

A. W. Hooker Associates Ltd. has announced that **Stewart Kyle** has been appointed to partner.

Kyle joined A.W. Hooker Associates Ltd. in 2011 as a quantity surveyor. Since that time, he has acquired experience in a wide range of projects involving design stage cost control. Kyle has provided valuable mentoring and leadership to his colleagues and is collaborative in overseeing the hands-on measuring and quantification processes. He has continued to build upon his skills and excel in cost estimating and project coordination and delivers a high standard of quality in all cost estimates under his care.

“I’m excited to take on this new challenge to continue on our path of strategic succession and future planning at A.W. Hooker,” said Kyle. “I will continue to build on the variety of our projects while managing customer relations and maintaining our timely service delivery. I have been supported in my development by Senior Management plus fellow colleagues and I look forward to grow as a leader within A.W. Hooker and the industry.” ♣

water's next awards 2020

Celebrating Canadian water leaders and champions

AWARDS GALA AND DINNER

Thursday, June 11

Delta Ottawa Centre

NOMINATE SOMEONE FOR 2020!

WATERSNEXT.COM



Branden, a carpenter, is one of the young professionals who took part in the Job Talks series.



L-R: RCCAO executive director Andy Manahan, MPP Jane McKenna, RESCON president Richard Lyall, and Job Talks Canada executive director Jon Callegher.



L-R: MPP Jane McKenna (parliamentary assistant to the Minister of Labour, Training and Skills Development), Minister of Children and Women's Issues Jill Dunlop, and Farah Mohamad, senior vice-president of the Toronto Region Board of Trade.

JOB TALKS TORONTO, ONT.

The Residential Construction Council of Ontario (RESCON) has released the Job Talks video series, testimonials from young professionals encouraging youth to join them in the skilled trades.

The series, launched during an event at the Toronto Region Board of Trade, features young people talking about their career in the trades, why they enjoy their job, and in some cases, the salary expectations that come with their position.

“We need to get the message out that there are thousands of well-paid, rewarding jobs that will be available for young Ontarians in the coming decade,” said **Richard Lyall**, RESCON’s President.

During the presentation at the Board of Trade **Jon Callegher**, executive director

of Job Talks, presented some encouraging statistics about the skilled trades industry, gathered through a survey of industry professionals of all ages:

- 73 per cent of skilled trades workers feel that they put in an honest days’ work most days, as compared to 66 per cent throughout the rest of the Canadian work landscape;
- 68 per cent of skilled trades workers said that their work gives them a sense of success and achievement, as compared to 49 per cent of the rest of Canadian workers;
- When asked if they often feel worried nowadays, 16 of the skilled trades workers said yes, versus 42 per cent of the remaining Canadian work landscape.

But positive statistics that demonstrate a positive work experience will not solve the

skilled trades crisis in Ontario. As noted by **Andy Manahan**, executive director of the Residential and Civil Construction Alliance of Ontario (part of the coalition of associations that worked with RESCON to launch the series), there is no silver bullet for solving the crisis, but having stakeholders in industry, government, and the education sector work together will help resolve the issue.

The hope is that, armed with the Job Talks video series, educators and guidance counsellors will have the resources they need to show young people the opportunities for rewarding careers in the skilled trades and, in turn, helped to solve the significant worker shortage expected in Ontario in the coming decade.

To view the Job Talks video series visit jobtalksconstruction.ca. 🍁

canadian
11th Annual **water**
summit

JUNE 10-12
2020
OTTAWA, ONTARIO
Delta Ottawa Centre

IN COLLABORATION WITH
CWWA **ACEPU**
Canadian Water and Wastewater Association / canadienne des eaux potables et usées
Window on Ottawa

THE KEYS TO A BLUE ECONOMY
Unlocking Water Policy, Governance and Technology in Canada





For sponsorship opportunities, contact **Natasha Mawji** at natasha@actualmedia.ca

@CdnWaterSummit #CdnWaterSummit Follow for updates and connect with us! watersummit.ca

PICK UP THE PACE!



By Chris Gardner

It's a powerpoint slide I often show in ICBA meetings, and it always draws an all-too-knowing groan from listeners: Canada ranks 34 out of 35 OECD countries in the length of time it takes to get a building permit. It's a telling and an embarrassing statistic for a G7 economy.

It takes nearly 250 days to get a permit in Canada—three times (168 days) longer than our competitors in the United States. In the OECD, only the Slovak Republic takes longer to approve a construction permit.

We should be embarrassed and frustrated. These delays add direct carrying costs to builders—along with extra cost in having to price the risk that uncertainty brings. It also slows investment and building by making the process unnecessarily difficult.

It's not just the private sector that suffers. The delays caused by more red tape, the demands to try and please absolutely everyone who has an opinion on a project—whether a genuine stakeholder or not—and the reluctance of politicians to make tough decisions, have rough implications for government projects too. A slow permit process makes infrastructure and community projects more expensive, meaning governments either have to tax or borrow more to build—or leave out necessary projects.

Think of the process involved in building the Site C clean energy project in northeastern B.C. It was April 19, 2010, when Gordon Campbell decided to move forward with Site C, owned by the province's electrical utility. He hoped to have it up and running by 2020.

But it took nearly five years to finally get all the permits and permissions to start construction. Even then it got bogged down in court. By the May 2017 election, more than \$1.75 billion had been spent, and the 2020 completion date was distant memory.

When the BC NDP government took over, they delayed the project further with yet another review. In the end, they decided to move forward as B.C. prepares for more electrical demand from vehicles, home heating, LNG plants, and other uses, as we transition (slowly) from fossil fuels. Now completion is expected in 2024 – at a price tag far higher than originally expected.

Obviously Site C is a larger, more complex project than what most governments build. But even small projects are being delayed by unnecessary red tape and politicians' fear of making decisions. It can take more than a year for communities to do even a simple project like install speed bumps in school zones, as consultation processes drag on and on.

The BC NDP took power in 2017 in part due to a promise to eliminate school portables in Surrey, the province's fastest growing city. Three years later, there are more portables than ever.

Similarly, they promised to build 114,000 units of affordable housing, mainly in the Lower Mainland. Three years later, they have delivered less than 2 per cent of that total.

Among the excuses offered by the province? Slow municipal building permit processes.

Community centres, road upgrades, sewer plants, schools, hospitals: even minor delays on these projects end up costing taxpayers money and longer-than-necessary inconveniences. It's time all orders of government have a long conversation about how to speed up construction permits—the problem has become too expensive to ignore. 🍁



Chris Gardner is the president of the Independent Contractors and Businesses Association.



INFRASTRUCTURE. BUT BETTER.

Leading the digital transformation.

We're driving the evolution of infrastructure by using technology to make it smarter, safer, and more connected.



Question today
Imagine tomorrow
Create for the future

WSP is proud to partner with our clients to deliver innovative and sustainable engineering solutions.

As a future-focused organization, we design and deliver projects that shape societies and connect communities, creating places where our friends, families and neighbours can thrive.

WSP—big, bold, ambitious thinking that inspires and influences.



wsp.com