November/December 2020

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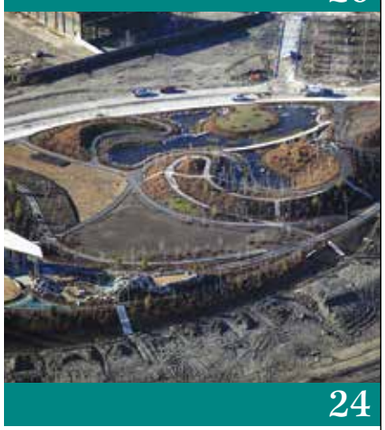

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P3 DEVELOPMENT BACK IN ALBERTA

By Andrew Macklin

It was a welcome sign when the Government of Alberta announced on September 9th that a Request for Qualifications had been issued for a package of five high schools to be delivered using the P3 model.

Under the previous NDP government, led by Rachel Notley, public-private partnerships had been frowned upon for infrastructure development. The government did not cancel any of the P3 projects already on the books from the previous Conservative government, but did not pursue any of their own.

When the new Conservative government was elected in April 2019, the belief was that the province would again embrace the use of P3s, as it had previously with such projects as the Calgary and Edmonton ring roads. Just seven months after the election, Infrastructure Minister Prasad Panda announced that the business case for the aforementioned package of schools would be developed with the use of the P3 model.

At a time where the province is struggling for revenues, and cuts had previously been made to infrastructure budget pre-COVID, this is the positive long-term signal that the industry needed from Alberta. It is a signal that, as the province works towards balancing its budget in difficult economic times, important infrastructure projects will continue to get built.

That's not only a positive sign for this industry, but a few others as well. For the resources market, this means that significant upgrades to the rural transportation necessitated by the need for further movement of goods should still move forward, as previous Conservative governments had a track record for delivering these types of projects as P3s. That could also spark renewed hope for the Fort McMurray region, one that is still calling for a second major highway to be developed in the wake of the transportation chaos that erupted during the Horse River fire in May 2016.

This could also be a positive sign for the tourism industry in the province. You may recall that, in June, a Memorandum of Understanding was signed between the Government of Alberta and the Canada Infrastructure Bank for the completion of studies and due diligence for the Calgary-Banff rail project. Once those studies are complete, if the rail project builds a successful economic and environmental case for proceeding, the province could look to a P3 to deliver the project.

The biggest question now is which sectors will the province focus on for the delivery of P3 projects? Will it be a case-by-case basis across all sectors, or will it be more defined than that? In addition to the transportation projects mentioned, could we see the delivery method used for the construction of new hospitals? We'll have to wait and see.

Regardless of your own personal feeling towards the public-private partnership model, it's at least good to see that the Government of Alberta is not ruling anything out when it comes to delivering major infrastructure projects in communities across the province.

Andrew Macklin is the managing editor of ReNew Canada.

andrew@actualmedia.ca

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MANAGING EDITOR	Andrew Macklin
GROUP PUBLISHER	Todd Latham
PUBLISHER	Nick Krukowski
ART DIRECTOR AND SENIOR DESIGNER	Donna Endacott
ASSOCIATE EDITOR	Simran Chattha
DIGITAL MARKETING COORDINATOR	Becky Umweni
DIGITAL EDITOR	Connie Vitello
EVENT MANAGER	Natasha Mawji
CONTRIBUTORS	Justin Crewson, Dan Gent, Catherine Lansley, Richard Lyall, Arash Shahi, Mira Shenker, Shahrzad Simab, Patty Toner, Mark Wessel
ADVERTISING	Nick Krukowski nick@actualmedia.ca
ADVISORS	Nick Reid, James Sbrolla

actualmedia

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ABOUT THE COVER

The pandemic has reinforced our need to think about how resilient our infrastructure is in the wake of a disruptive event. For more on this story, turn to page 12.

CORTELLUCCI VAUGHAN HOSPITAL REACHES SUBSTANTIAL COMPLETION

Credit: Infrastructure Ontario

Substantial completion of the new Cortellucci Vaughan Hospital, the first net new hospital to be built in Ontario in more than 30 years, has been reached. The milestone signals the completion of the bulk of construction on the project and the start of months of work ahead to ensure the hospital is ready to provide patient care. When it opens in early 2021, Cortellucci Vaughan Hospital will double access to care for the communities of Vaughan, King, and Richmond Hill, and add necessary capacity to the health care system.

Construction on Cortellucci Vaughan Hospital broke ground in October 2016. The project was delivered by Plenary Health, along with partners PCL Constructors Canada Inc., Stantec, and Johnson Controls. The project reached substantial completion on August 26.

With construction substantially complete on Cortellucci Vaughan Hospital, Mackenzie Health teams will begin the task of turning the building into a fully functional hospital so that it can safely open its doors to patients. This includes installing and testing thousands of pieces of equipment, training more than 3,000 staff across both sites, and developing and simulating a number of mock patient scenarios.

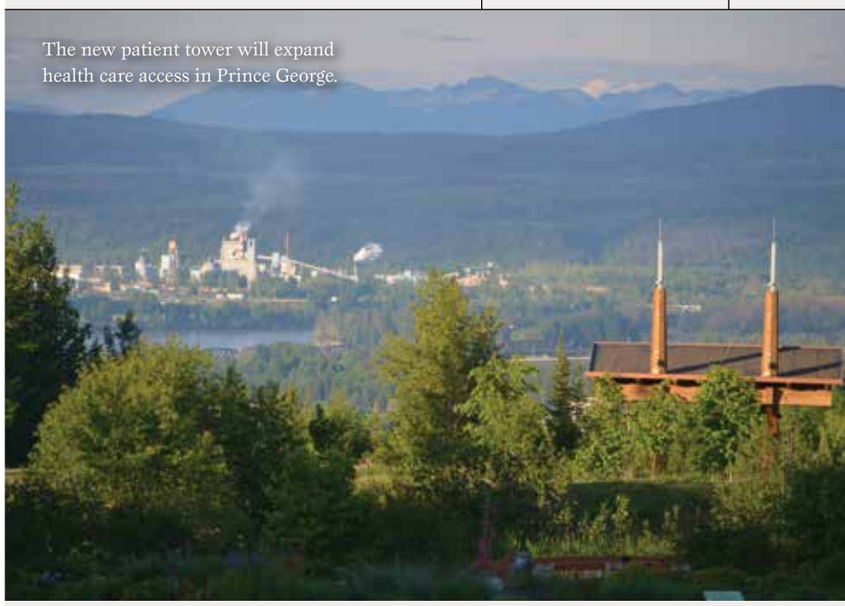
To date, the provincial government has invested $1.3 billion for construction of the project. An additional $178 million has been raised from the community to date as part of Mackenzie Health Foundation's $250 million Ultimate campaign.

NEXT ISSUE: JANUARY/FEBRUARY THE TOP100 PROJECTS ISSUE

Megaproject Landscape
Where Canada's largest projects are being built.

A Price on Transportation
Should cities start charging for road use?

Lasting Change
The long-term impacts of COVID-19 on construction.



The new patient tower will expand health care access in Prince George.

NEW PATIENT TOWER APPROVED FOR UHNBC

The Government of British Columbia has approved the concept plan for a new patient care tower, including a new cardiac care unit, at University Hospital of Northern British Columbia (UHNBC) in Prince George.

"UHNBC has needed redevelopment for years and in my visits to the community I have personally seen how out-of-date the current facility is," said Adrian Dix, Minister of Health. "Today's action speaks to the future—in particular the ability to deliver improved cardiac care services in the North. This has been a goal for a long time and I am proud to be part of making it happen. Congratulations to the Northern Health Authority, the Prince George community and the entire region for this breakthrough."

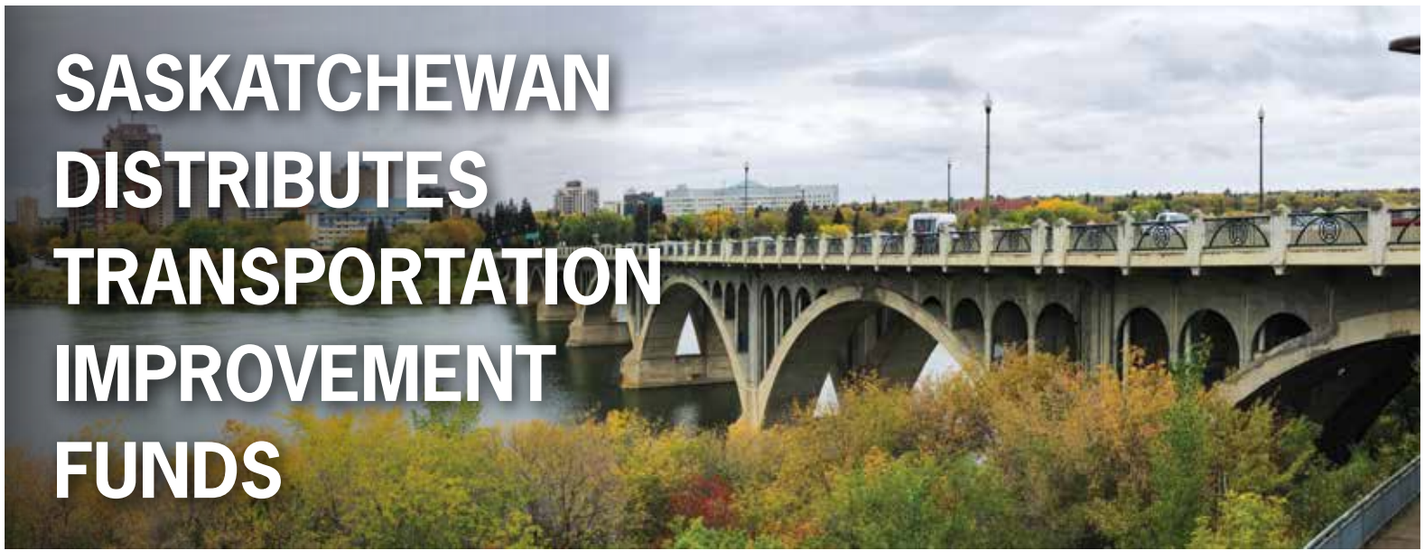
The current hospital is outdated and too small to safely accommodate the needs of a growing and aging regional population. Local leaders have specifically identified cardiac care as an important service gap for a new facility to address.

Northern Health submitted a concept plan to the provincial government in December 2017, which was amended in February 2020. The Treasury Board approved that concept plan—securing funding for the project in the government's 10-year capital plan.

The business plan phase will now get underway and will finalize details, such as scope of the new facility and budget. This includes providing details for a variety of acute care services for the facility, including new mental health, surgical, and cardiac units. This stage takes approximately 12 to 18 months. Upon approval of the business plan, the project will proceed to procurement, then construction.

This announcement builds on government's investments in the North, including new and expanded hospitals in Terrace, Fort St. James, Dawson Creek, and Quesnel, delivering public healthcare in state-of-the art centres.

UHNBC was built in 1958 and was originally called Prince George Regional Hospital. Additions were completed in 1978 and 2003. There are 10 additional buildings that make up the 216-bed UHNBC site.



SASKATCHEWAN DISTRIBUTES TRANSPORTATION IMPROVEMENT FUNDS

The Province of Saskatchewan recently announced the distribution of $70.3 million to municipal governments to assist with COVID-19 pandemic relief, as Saskatchewan's portion of the federal Safe Restart Canada Plan. Government Relations Minister Lori Carr announced the money will begin to be distributed immediately to all compliant Saskatchewan municipalities.

Of the amount, $62.26 million will be granted in general municipal support on a per capita basis, while $8.07 million will be allocated to municipal public transit support for the four cities with transit systems, based on ridership.

The four larger centres are receiving the following transit allocations: Saskatoon is receiving $4.3 million, Regina is receiving $3.5 million, Moose Jaw is receiving $161,000, and Prince Albert is receiving $141,000.

This federal funding was matched by funds from Saskatchewan's Municipal Economic Enhancement Program.

The Government of Saskatchewan is also rebuilding 50 kilometres of Highway 24 between Spiritwood and Chitek Lake. This project is part of the government's $7.5 billion two-year capital plan to build a strong Saskatchewan and stimulate the economic recovery following the pandemic.

The 50-kilometre project will be delivered in two stages. The first 21-kilometre section from Spiritwood to Leoville will be tendered this fall, while the second segment, from Leoville to Chitek Lake is expected to be tendered in the spring. Construction is scheduled to begin in 2021.

Highway 24 is located west of Prince Albert, and provides community access to the village of Leoville and Pelican Lake First Nation, and access to Chitek Lake. This corridor has high vehicle and truck traffic for a regional road with more than a thousand vehicles per day north of Spiritwood.

CALL FOR PROPOSALS TO STUDY MOBILITY AND PUBLIC TRANSIT

Catherine McKenna, Minister of Infrastructure and Communities, and Ted Hewitt, president of the Social Sciences and Humanities Research Council (SSHRC), announced funding for up to 10 Knowledge Synthesis Grants on mobility and public transit. The projects will focus on consolidating and reviewing existing research findings, knowledge and data to better understand transit issues at the community level, leading to better, more strategic infrastructure investments.

Researchers will examine topics such as the social and economic implications of unequal access to public transit, including in rural communities, the environmental and land use considerations around integrated transit planning, and they will identify the challenges for transit services to maintain public health and safety in a post-COVID-19 world. Summary reports of the research will be made available to the public to assist in developing future research agendas and support evidence-based decision-making.

"Public transit allows Canadians to get where they need to go quickly, cheaply and efficiently. Now with the impact of the COVID-19 pandemic, understanding the changing transit needs of Canadian commuters is more important than ever," said McKenna. "This project with the Social Sciences and Humanities Research Council will give municipal leaders across Canada new information and tools so they can make smart decisions about public transportation infrastructure that will meet the needs of their communities today and well into the future."

SSHRC has opened a call for proposals to the Canadian research community. Applications are due by December 17, 2020, and evidence briefs summarizing the findings and policy implications will be made available in Fall 2021.

Infrastructure Canada is providing $300,000 to SSHRC for up to 10 research grants that are each $30,000. SSHRC will commit up to $25,000 for the organization of a Knowledge Mobilization Forum in fall 2021.

More information can be found on the SSHRC website at *sshrc-crsh.gc.ca*.

Photo credit: Andrew Oliveira

RCCAO PROPOSES SIX-POINT PLAN TO SPEED UP UTILITY LOCATES

Excavation without proper utility locates, whether in a road allowance or for a residential backyard, can cause deadly incidents. As such, it is critically important for the province's One Call System, which generates utility locates, to keep up with the demand for timely information.

Construction contractors lose money when they must delay work while waiting for utilities and telecommunication firms to provide markings. In Ontario, hundreds of municipal and other infrastructure projects are held up because there are long wait times for utilities to provide timely and reliable locate services.

RCCAO has proposed a six-point plan to speed up the delivery of locates. The plan was sent to Premier Doug Ford, and the Government and Consumer Services Minister.

Our brief noted that over the years the delivery of locates has been chronically late. Ontario has a deadline of five business days for locate responses, but these often come weeks after the deadline.

"Ontario needs significant improvement in response times as we are depending on construction to be a leading sector in pandemic recovery efforts," says RCCAO executive director Andy Manahan. "Reducing wait times will have a big impact on helping contractors deliver projects on time and more cost-effectively."

The RCCAO brief recommends that:

1. The board of One Call be restructured so six of the 12 members are non-utility representatives.
2. Stakeholders and One Call work to maximize the sharing of locate responses among contractors and subcontractors working on the same site.
3. All utilities be encouraged to maximize the validity period of their locate tickets without impairing the health and safety of workers and the public.
4. Locate service providers be prequalified to locate all utilities, whenever possible.
5. One Call and utilities be required to differentiate between single-address and multi-address locates.
6. The need for additional locates be eliminated once a stationary vertical excavation has been dug below the depth of the lowest buried utility.

Visit rccao.com to find out more.

FROM THE THRONE

Federal government promises infrastructure initiatives in fall speech.

By Andrew Macklin

In a throne speech like no other in Canadian history, with social distancing measures in place and two opposition party leaders force to observe from home due to COVID-19 quarantine measures, the federal government made significant commitments to new infrastructure for the country.

Leading up to the speech, it was expected that new spending would focus on a green agenda, but as the second wave of COVID-19 hit several regions throughout the country, this message was toned down to focus on economic and health priorities. But there was no lack of public infrastructure investment as part of the tweaked fall government agenda.

Here are some of the details of the key investments, programs, and commitments as presented in the Throne Speech, delivered in the Senate on September 23.

Taking action on climate change

As expected, a section of the Throne Speech was committed to addressing issues surrounding green priorities for the government.

The focal point of the plan was a multi-tiered approach to emissions reductions across the country.

"The Government will immediately bring forward a plan to exceed Canada's 2030 climate goal. The Government will also legislate Canada's goal of net-zero emissions by 2050.

As part of its plan, the Government will:

- Create thousands of jobs retrofitting homes and buildings, cutting energy costs for Canadian families and businesses;
- Invest in reducing the impact of climate-related disasters, like floods and wildfires, to make communities safer and more resilient;
- Help deliver more transit and active transit options;
- And make zero-emissions vehicles more affordable while investing in more charging stations across the country."

The federal government cited exciting opportunities in the development of new energy technologies on Canadian soil, such as next generation batteries, thanks to the natural resources found in Canada. With materials and expertise already on Canadian soil, further supports are being put in place to encourage the growth of this emerging technology market: "The Government will launch a new fund to attract investments in making zero-emissions products and cut the corporate tax rate in half for these companies to create jobs and make Canada a world leader in clean technology."

A keen focus on continuing the drive towards clean energy was also demonstrated in the speech, as the government looks to continue to transition all provinces and territories away from carbon-emitting power generation. This includes transforming "how we power our economy and communities by moving forward with the Clean Power Fund, including with projects like the Atlantic Loop that will connect surplus clean power to regions transitioning away from coal; and support investments in renewable energy and next-generation clean energy and technology solutions."

With the importance of nature demonstrated during the pandemic. Prime Minister Justin Trudeau (inset) used the Throne Speech to announce a plan to expand urban green space.

Expanding broadband access

One of the clearest vulnerabilities exposed during the COVID-19 pandemic was the lack of consistent, or any, access to broadband services in communities across the country. This wasn't just an issue in rural communities, but in pockets scattered throughout the urban landscape. Recognizing this, the Government of Canada announced it will take action.

"The Government will accelerate the connectivity timelines and ambitions of the Universal Broadband Fund to ensure that all Canadians, no matter where they live, have access to high-speed internet."

The Universal Broadband Fund calls for every Canadian to have access to high-speed internet at minimum speeds of 50/10 Mbps (Megabytes per second), with a plan to invest up to $6 billion over 10 years. The fund was originally introduced in the government's budget presented in March 2019.

Adding green space

Another vulnerability exposed during the pandemic was the lack of green space in some of Canada's urban centres, as people flocked to parks during the warm weather to escape being behind closed doors for the majority of the week. The speech included a note about expanding public spaces, stating that: "This pandemic has reminded Canadians of the importance of nature. The Government will work with municipalities as part of a new commitment to expand urban parks, so that everyone has access to green space. This will be done while protecting a quarter of Canada's land and a quarter of Canada's oceans in five years, and using nature-based solutions to fight climate change, including by planting two billion trees."

How this will manifest will be key as development picks up again in the months ahead. The call to "expand urban parks" could take on many forms, from provisions in the national building code for the creation or maintenance of green space, to federal investment in municipal greening initiatives.

New approach to water

In the past few months, we have heard some new language around the federal government commitment to water infrastructure, and that language continued in the plans for the fall agenda.

"The Government will create a new Canada Water Agency to keep our water safe, clean, and well-managed. The Government will also identify opportunities to build more resilient water and irrigation infrastructure.

At the same time, the Government will look at continuing to grow Canada's ocean economy to create opportunities for fishers and coastal communities, while advancing reconciliation and conservation objectives. Investing in the Blue Economy will help Canada prosper."

How the government chooses to define its spending priorities for "more resilient water and irrigation infrastructure" will be important for municipalities who have suffered from recent flood events.

Bridging the Indigenous gap

A multitude of issues have been exposed in Indigenous communities across the country in the wake of the COVID-19 pandemic.

A lack of access to clean water, medical services and supplies, food stocks, and broadband services were among the key problems that continue to go under-addressed, and became even worse in the early weeks of the pandemic. It led to some shutting down access to their communities and having to make do with the limited supplies they had in an effort just to keep themselves safe.

Broadband and health care issues were addressed within the speech, which also included a few separate notes about infrastructure, with the government stating its commitment to "continuing to close the infrastructure gap in Indigenous communities, working on a distinctions-basis with First Nations, Inuit, and the Métis Nation to accelerate the government's 10-year commitment. The Government will also make additional resiliency investments to meet the clean drinking water commitment in First Nations communities."

The government's self-imposed deadline for ensuring all First Nations communities have access to clean drinking water is coming fast, and the need for new infrastructure solutions to meet current demand could be on the horizon.

Fixing the national supply chain

It was a fleeting note in the speech, but one that will be very important for infrastructure development in the weeks and months ahead. As companies look for access to resources and skilled personnel to meet the demands of increasing infrastructure investment, barriers that will slow construction need to be eliminated.

That's why it will be important to observe how the government keeps a notable commitment made in the speech:

"Now, more than ever, Canadians must work together—including by eliminating remaining barriers between provinces to full, free internal trade—to get the economy back up and running and Canadians back to work."

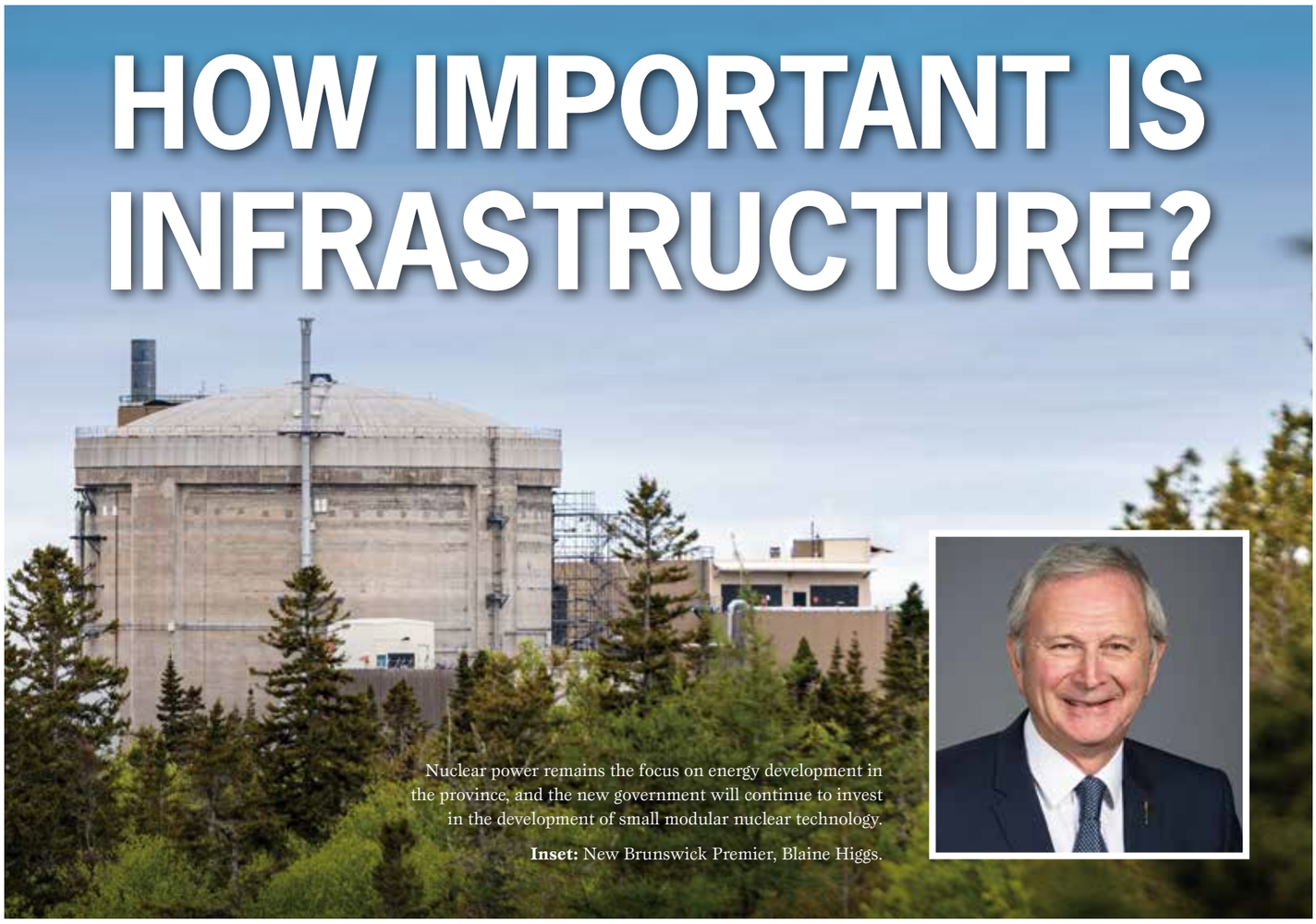
Being able to share resources across provincial lines, rather than relying on shipments and personnel from other jurisdictions, could go a long way in keeping infrastructure projects on track.

With a throne speech dedicated to keeping Canadians healthy and attempting to keep the economy rolling, it will be important to watch how the government does in executing its new commitments to infrastructure development across the country.

The Government will work with municipalities as part of a new commitment to expand urban parks, so that everyone has access to green space.

Andrew Macklin is the managing editor of ReNew Canada.

HOW IMPORTANT IS INFRASTRUCTURE?



Inset credit: Government of New Brunswick

Nuclear power remains the focus on energy development in the province, and the new government will continue to invest in the development of small modular nuclear technology.

Inset: New Brunswick Premier, Blaine Higgs.

How the sector could be impacted by New Brunswick's majority government.

By Catherine Lansley and Patty Toner

On September 14th New Brunswick went to the polls and delivered Premier Blaine Higgs a majority Progressive Conservative government in Canada's first election since the beginning of the COVID-19 pandemic. Higgs took advantage of the popularity boost most premiers have experienced as a result of the pandemic to secure the majority, successfully making the point that stability was needed given the pandemic-induced climate of uncertainty. The snap election may be a trend copied by other provinces, but the approach to economic recovery looks to be an outlier when it comes to infrastructure spending.

Stability on the east coast

August was a tumultuous month for politics in Atlantic Canada. Stephen McNeil, the Premier of Nova Scotia, announced he would step down once a replacement is selected. Andrew Furey was sworn in as the new Premier of Newfoundland and Labrador after his predecessor Dwight Ball announced he would stand down in February. New Brunswick's Premier Blaine Higgs called the snap election on August 17 citing the need for stability in a difficult time for the province.

When the election campaign began, Higgs was enjoying high approval levels and, throughout the campaign, COVID-19 and health care were top concerns. Higgs' majority election win is the first re-election of a provincial government in the province since 2003 and gives the PCs a mandate to continue to execute COVID-related programs without needing to rely on the support of other parties.

Premier Higgs had been in his role since 2018 having narrowly won the most seats, but failing to win an outright majority and also losing the popular vote to the incumbent Liberals. This election saw the Progressive Conservatives win 27 of the province's 49 ridings, two more seats than the 25 required for a majority government. The Liberals took 17 seats, 4 fewer than in 2018, the Green Party kept their three seats and the People's Alliance won two seats.

Spending versus saving

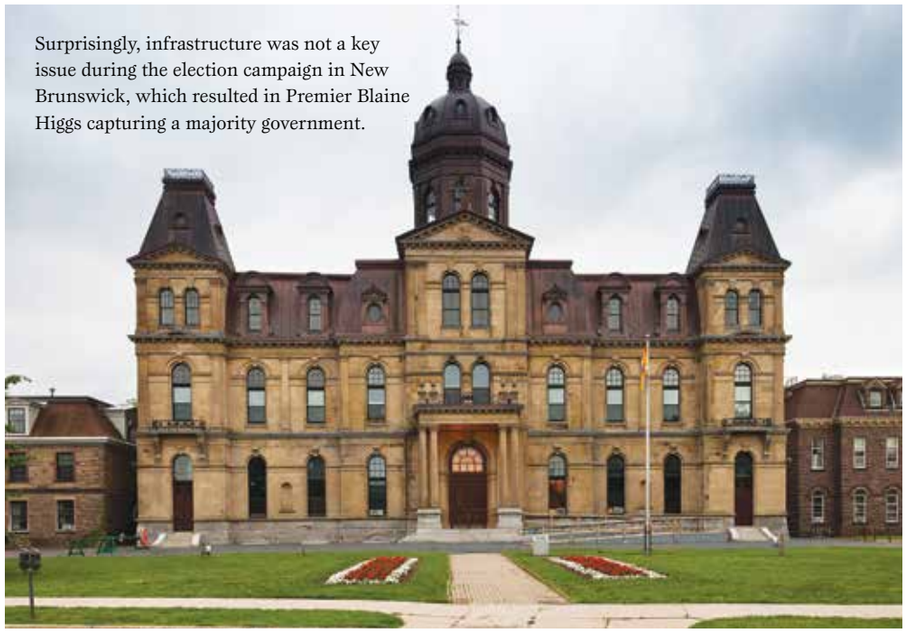
The election was fought on two different philosophies for dealing with the economic fallout of the pandemic. The PCs looked to get the province's financial house in order, and the Liberals saw infrastructure investment as a tool for recovery.

The PC's emphasized fiscal prudence, with digital transformation of public services featuring high on the agenda. Enhanced connectivity was also a priority with a pledge to expand rural broadband and setting a goal of province-wide 5G. The PC platform pointed to a $62 million commitment for housing in the first three years of a 10-year program agreed with the federal government, including new builds and repairs, and exceeding National Building Code requirements on energy consumption and greenhouse gas emissions. They also point to their investments in building retrofits and recycling, with expansions of the glass recycling program, a ban on single use plastics, and a shift towards extended producer responsibility to divert more waste from landfill.

In their first capital budget in 2018, the PCs cut planned infrastructure spending by

a third on the level promised by the previous government. In a December 2019 capital budget update, Premier Higgs trimmed again reducing capital spending to just under $600 million, a small reduction on the previous year. This came after Premier Higgs had cancelled a number of infrastructure projects early in his first mandate. These projects included Route 11 upgrades, refurbishing Fredericton's Centennial Building and constructing a new courthouse attached to it, replacing the New Brunswick Museum in Saint John, and road work in the Perth-Andover. This came with a price tag of $31 million in cancellation costs.

On the campaign trail Liberal Leader Kevin Vickers had promised to leverage more federal money to pay for infrastructure projects and criticizing Higgs' project cancellations. Highlighting that of the $673 million set aside in the federal Investing in Canada plan for New Brunswick, 78 per cent remained unallocated. The Liberals also committed to implementing a 10-year agreement with the federal government, signed under the former Liberal Premier, to renew and expand social and community housing and to continue to develop the five scenic drives and the signature trails program.



Surprisingly, infrastructure was not a key issue during the election campaign in New Brunswick, which resulted in Premier Blaine Higgs capturing a majority government.

Enhanced connectivity was also a priority with a pledge to expand rural broadband and setting a goal of province-wide 5G.

Premier Higgs argued for the need for greater flexibility on federal infrastructure funding, claiming the program was designed for larger cities. Prior to the election the Premier was under fire for opting out of discussions with the federal government related to COVID-relief funding for transit systems. His response was that he had not been made aware of details of a federal transit relief program following discussions with the provinces, believing it to be designed for larger transit systems which would not apply to New Brunswick. The federal offer was to compensate all transit systems across Canada for pandemic-related revenue losses and enhanced cleaning and other expenses, if host provinces would share half the cost.

The nuclear option

While infrastructure commitments in the PC platform were thin on the ground, one area of promise is in energy. As one of two provinces that currently generates electricity from nuclear reactors, New Brunswick has hitched its wagon to the technology going forward. Higgs has thrown his support behind the development of small modular nuclear reactor (SMR) technology. The province has one of the more eclectic energy mixes in Canada with nuclear generating 30 per cent, renewables including hydro around 50 per cent, and coal still being used for 20 per cent on electricity generation.

New Brunswick's only nuclear plant at Point Lepreau started operations in 1983 and underwent a refurbishment that was completed in 2012 to extend its life by an expected 25 to 30 years. Looking to the future the province signed a Memorandum of Understanding with Ontario and Saskatchewan, and more recently Alberta, to develop the technology and produced its own SMR Action Plan.

Island on the mainland

Although New Brunswick is firmly anchored on the Canadian mainland it has been an island in its approach to economic recovery. Conservative governments in Saskatchewan and Manitoba made substantial additional commitments to infrastructure. Alberta accelerated projects and spending, and Ontario largely held the line on commitments made. Neighbouring provinces have also ramped up ambitions on infrastructure projects in recent years as part of their economic development plans. Under Premier Higgs, New Brunswick remains focused on belt tightening.

The province is projected to run one the lowest budget deficits in 2020-21, and although the debt to GDP stands at around 38 per cent it sits in the middle of the pack compared to other provinces. Premier Higgs points to the work done prior to the pandemic as being critical in putting the province on a sound footing to cope with the economic fallout.

A trendsetter?

Where New Brunswick may stand alone on cutting capital budgets, it could become a trendsetter for snap elections amongst jurisdictions with minority governments. British Columbia already followed suit, and the federal government will look on in envy at Premier Higgs' majority mandate. There is a word of caution though. Although Premier Higgs' managed to convert his upswing in popularity, the optics of throwing an election in larger provinces struggling to manage growing COVID-case levels may backfire as a dangerous move and political opportunism.

Catherine Lansley is a research analyst with Global Public Affairs in Ottawa.

Patty Toner is a senior consultant with Global Public Affairs in Ottawa.

DESIGNING FOR DISRUPTION

Infrastructure solutions that will ready Canada for whatever comes next.

By Andrew Macklin

When the COVID-19 pandemic hit Canada in March, it was clear that we weren't ready. Even in the industries that did their due diligence to plan for a disruptive event, the widespread impact of the pandemic was greater than expected. Governments, industries, and the general public had to move quickly to react to what had happened, and vulnerabilities were exposed.

ReNew Canada, in collaboration with Logistec, gathered industry leaders for a conversation to analyze how the country was caught off guard by the impact of the pandemic. The lived experience has provided a plethora of lessons that can now be learned from, but only if Canada is prepared to invest the money and resources to do so. Is the investment in a proactive approach a better expense than the money saved from doing very little or nothing to protect the country from whatever comes next?

Vulnerabilities exposed

The onset of the COVID-19 pandemic made it abundantly clear just how unprepared Canada was for a nationwide disruptive event of this nature. All three panellists agreed that while we weren't ready for it, we did react well to what happened, but vulnerabilities were certainly exposed.

"An obvious one was our infrastructure," explained Martin Bureau, vice president of innovation at Logistec. "One concrete example is our streets. Sidewalks are not built in a way that we can avoid social contact." Bureau went on to mention that travel logistics was also an immediate concern, as physical distancing was near impossible with everyone travelling to work, and being at work, at the same time as everyone else in the company, making it near impossible to keep a reasonable distance away from commuters and colleagues alike.

Rory Baksh, a partner at Dillon Consulting, pointed to the security of our assets as an issue that was encountered early on. "We are not as cyber secure as we thought we might be," said Baksh, who pointed to the cyberattack on Zoom early on in the pandemic as an example of the vulnerability that was exposed in our online security. He noted that, if the infrastructure sector continues to work towards automation and remote-control operation in the sector, significantly increased cyber security will also have to be introduced.

For Heather Morgan, the sustainability and risk management lead for AECOM based in New York City, the vulnerability that was exposed wasn't entirely clear without looking at the life cycle of the pandemic. It started with the worst-case scenario and played its way back, showing a number of vulnerabilities that needed to be immediately addressed:

- Where do you put the bodies when the morgue is full?

Emergency response protocols can be developed for disruptive events of all kinds, not just natural disasters such as forest fires and severe weather events.

The development of resilient infrastructure can be beneficial during all kinds of disruptive events, such as developing stronger broadband that would allow work and school to be conducted from home in the event of a weather event like a snowstorm.

Disruptive events must be considered as part of land use planning, ensuring capacity is available for such things as mobile hospital units within a community.

- Does that location have refrigeration?
- How do you safely transport them?
- Do you need onsite crematoriums to eliminate the concern?
- What do you do with the contaminated human waste as it enters the wastewater system?
- How do you protect the workers involved in the process, especially if they have to be quarantined away from their families?

needed to support the disruptive event?

Land planning for disruption

The demands on the health care sector were exposed not just from a capacity issue, but from the perspective of the planning and flexibility of the space at facilities.

From an exterior perspective, few hospitals found themselves in a position to add temporary facilities to meet the increase needs for beds, isolation, and/or testing capacity. In terms of interior capacity, having the ability to quarantine a portion of the hospital or health care centre to just address the demands of the pandemic, was demonstrated as a necessity. But few health care systems had a plan for this in place, or lacked the flexibility to create such a space.

Outside of the demands on the health care sector, that need to play the scenario out needs also to be applied to the way people move within the community. There is the aforementioned issue regarding sidewalks, which don't allow for people to walk past each other while still keeping six feet apart. This issue can, in part, be eliminated by the addition of bicycle lanes on major streets, giving pedestrians the extra space to move around each other while walking.

The issues hampering pedestrian movement also includes green space, an increasing issue in major urban centres. Toronto became the epicentre of this issue in the early weeks on the pandemic, as people flocked outside in the nice weather, but failing to keep proper physical distance in the process. The lack of green spaces in populous urban centres, places where people can get outside to maintain a high quality of life, is another of the vulnerabilities exposed during the pandemic.

Baksh also pointed to under-utilized community facilities, and how long they sat idle during the pandemic. He suggested that communities should take a closer look at these centres and re-imagine

> The need to accelerate the installation of reliable IT and broadband infrastructure is a key lesson learned from the pandemic.

It's a morbid way of examining the situation, but it does demonstrate where some of the unexpected infrastructure demands were exposed. Without playing out such a scenario, understanding the entire life cycle of the pandemic, how can you understand what infrastructure is

THE IMPACT OF DISRUPTION

Do you think COVID-19 exposed vulnerabilities in Canadian infrastructure?

Yes 93.5%

No 6.5%

What type of disruptive events are cities LEAST prepared for?

Disease 53.1%

Flood 15.6%

Power Outage 9.4%

Other 21.9%

What type of adaptive public infrastructure is in greatest need in Canada?

Mobile medical facilities 53.3%

Mobile water purification 26.7%

Mobile power centres 10%

Other 10%

these locations from the perspective of an emergency; how could they be used to meet the local needs during a disruptive event?

Transparent communication

He used the example of a library in his neighbourhood, one he frequents with his daughter, and wondered how it could have been used for the benefit of the community.

One of those purposes is the clear communication of local information related to the ongoing emergency. A centre can be used as a gathering spot for the distribution of information, as well as any emergency resources. You can also circle back to the health care capacity issue, and wonder if such a flexible multi-use facility could become a testing centre or quarantine area.

Up front, clear communication is important during the disruptive event. Not only because of the confusing and sometimes inaccurate information that can be pushed out through social media platforms, but also to give residents the opportunity to do something about the situation at hand. "You want people to feel that they've been given information that empowers them, that they can do something about what is happening," said Morgan.

Baksh noted that this communication is also the opportunity to get the community to look at infrastructure differently. He noted that citizens need to understand how infrastructure functioned during the pandemic, such as water, energy, and recreation, and engage the community on how this gets funded This can help the community grasp a greater appreciation for both the physical and human cost of keeping the lights on, the water flowing, and parks functioning, as well as how the reduction of transit revenues impacts the municipal bottom line.

Bureau followed by focusing on streets, and the fact that the pandemic provides an opportunity to fully appreciate how they do, and should, function. By engaging the community, they can provide their own solutions about what they think is necessary to reduce exposure but still be able to get around the city, regardless of the mode of transportation used.

A proactive approach

These are the types of conversations that need to be had in the fallout from the pandemic, and communities of all sizes due their diligence to prepare for the next disruptive event.

Morgan explained that greater storing and staging for a disruptive event will be an outcome of the pandemic. Among those will be green space, as cities ensure that quality of life, and the well-being of its residents, is seen as a priority. This also includes smaller cities, where even greater opportunities for nature-based solutions are present.

"In second and third tier cities where there's more natural systems still intact and there is still green space, I think we need to look really hard at what are those landscape typologies and we can evolve them into putting in nature-based features." She cited stormwater and residential flooding as something that can be addressed, in part, through such solutions.

Bureau suggested that a change to the current system of project procurement in Canada would create stronger assets that could lessen the impact of a disruptive event. He believes that the entire life cycle of the asset needs to be considered during the procurement process, from the materials used to build the project to the allocation and flexibility of space allocated.

From Baksh's point of view, the need to accelerate the installation of reliable IT and broadband infrastructure is a key lesson learned from the pandemic. Communities that couldn't get online suffered in their ability to properly react to the pandemic, giving people the necessary resource that would allow them to work from home, stay in their bubble, and keep their distance from others. And with the emergence of e-medicine over the past several months, the need for broadband access was further demonstrated.

Sensor innovations in the water sector have proven to be a valuable asset for taking a proactive approach to disruption response. The evolving technology has the ability to read elevated levels of chemicals and strains in drinking water and wastewater, helping to pinpoint the source of, in this case, COVID-19 in the water. This application was used in Arizona, where COVID-19 detected in the wastewater from a university residence helped prevent an outbreak that could have impacted thousands of students.

There is also consideration to be given to the development a set of government protocols that can dictate some of the actions taken during a disruptive event. During the COVID-19 pandemic, the provincial, territorial and federal governments decided on actions to take as things progressed, rather than referring to an action plan already in place. This is the system in place for floods and storm surges in the United States, Morgan noted, and would be a valuable approach to all forms of disruptive events.

With a trans-disciplinary, collaborative approach that involves all stakeholders, public and private, a proactive approach to disruptive events can be designed. The actions taken to build infrastructure that is flexible, considers the entire life cycle, and explores the needs of a future disruptive event, can create more resilient communities that can withstand what comes next.

> Few hospitals found themselves in a position to add temporary facilities to meet the increase needs for beds, isolation, and/or testing capacity.

Andrew Macklin is the managing editor of ReNew Canada.

TOP100 PROJECTS DINNER: FEBRUARY 16, 2021

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As wildfires emerge in new regions of the Canadian landscape, the industry needs to understand how best to protect energy assets that are threatened as a result, ensuring communities have consistent access to power.

TURNING DOWN THE HEAT

Electricity infrastructure wildfire mitigation and climate change adaptation.

By Justin Crewson, Dan Gent, and Shahrzad Simab

If you ask an electric utility professional about what is top of mind for them day-to-day, you will likely hear some combination of safety, security, sustainability, reliability and affordability in response. If you ask around enough, you will start to notice that this list will almost always begin with the word Safety is core to how the electricity sector operates.

The well-being of others is core to how the electricity sector operates. We go to great lengths to ensure that safety awareness is engrained in the culture of our workforce. As a part of this drive, Canadian Electricity Association (CEA) member companies strive to be global leaders in infrastructure maintenance, and the sector continues to search for ways to improve. In fact, best practice sharing is one of the key functions that CEA provides stakeholders.

Wildfire risks have long been a concern for electric utilities. However, as climate change intensifies, the risk and severity of wildfires has been increasing. Researchers, including experts from Natural Resources Canada (NRCan), identifying a significant increase in the geographical area burned by wildfires between 1959 and 2015 in Canada, and observed a doubling in the number of large fires across the country. They also found that the country's fire season got two weeks longer over this period, with fires now beginning approximately one week earlier and ending one week later. Since 1990 these changes have become particularly acute.

In response to this trend, and with safety as the focus, CEA recently led developed the Utility Wildfire Mitigation Guide. It provides an inventory of best practices for Canadian electric utilities, with the goal of reducing or eliminating ignitions from electricity infrastructure and promoting the sector's resilience to wildfires, all while maintaining a safe and reliable service to customers.

Utilities world-wide have become all too aware of what is at stake. For instance, the 2018 Camp Fire in California was linked to Pacific Gas & Electric owned transmission lines. Tragically, the fire resulted in over 80 deaths and destroyed nearly 19,000 properties. The Camp Fire reaffirmed the criticality of developing strategies to mitigate

> The sector's mitigation concerns do not end with wildfires. Climate change is also creating other threats to grid safety and reliability.

against this heightened risk environment.

However, the sector's mitigation concerns do not end with wildfires. Climate change is also creating other threats to grid safety and reliability. For instance, floods and other severe weather events have been on the rise in Canada. Large events such as these—which are outside of the control of a utility—are classified as significant events (i.e. events deemed catastrophic in nature).

In 2018, Significant Events exceeded 50,000,000 Customer-Hours of Interruptions (CHI), the accumulated duration of outage events. Again in 2019, Canada was hit with 50,000,000 CHI. This marked the first time since CEA started capturing ME data in 2003 that CHIs recorded over 50 million in consecutive years.

While Canada's over 80 per cent non-emitting generation capacity holds great promise in terms of enabling the clean electrification of the Canadian economy, ensuring that the infrastructure required to deliver this energy is adapted for the increasing effects of climate change introduces some significant challenges. Governments, regulators, industry, and other stakeholders must work together to ensure that while we move towards the grid of the future, we are also implementing the safety and climate mitigation measures that this future requires.

One clear role that CEA will play on behalf of the sector during this transition is to build upon and encourage strong partnerships with the federal government. Some important work has already been done towards this end.

In 2017, NRCan partnered with CEA on a three-year project to develop climate adaptation planning guidelines for electricity companies in Canada. These guidelines are intended to serve as recommended processes for utilities to follow when developing company-specific climate adaptation plans. Official publication of the climate adaptation guidelines is planned for fall 2020, and as part of this project, CEA has also held a series of workshops for electricity companies across Canada. These workshops facilitated hands-on understanding, interpretation, and application of the proposed guidelines.

However, more should be done to help ensure we are prepared for the future. Climate adaptation and mitigation will entail increased costs over current business practices, and governments and regulators should partner with industry to address this reality. In its 2020 pre-budget submission, CEA called for a Federal Climate Adaptation Fund for electricity infrastructure. Such a fund could prove critical in offsetting the increased costs associated with mitigation and adaptation practices such as burying power lines and reinforcing electricity structures.

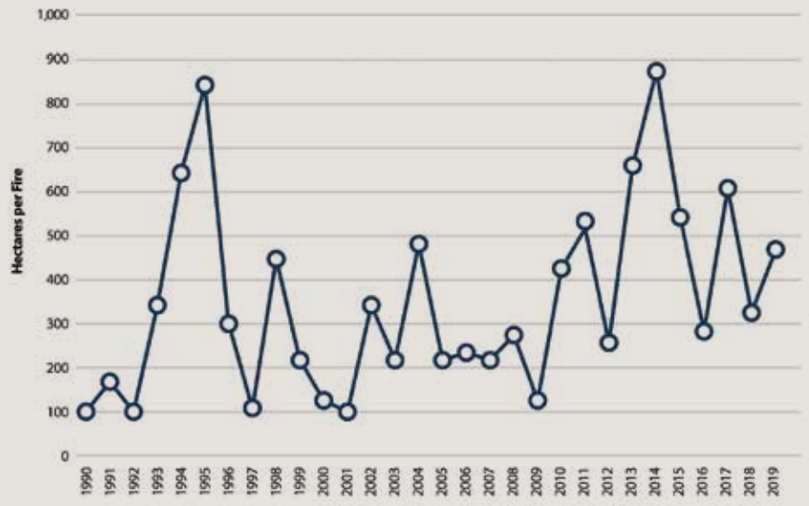
We can also look towards international jurisdictions facing similar issues. For instance, the Florida Public Service Commission (PSC) has moved to fast-track regulatory approval for storm-protection projects to prepare our grids as quickly as possible for the new risk environment.

The American National Oceanic and Atmospheric Administration (NOAA) now shares satellite data and assets with U.S. utilities during fire season to provide advanced warning of potential new fires. Such information and asset sharing agreements represent low-hanging fruit for wildfire mitigation and climate adaption in Canada.

CEA urges the federal government to consider developing a national task group that can work with the electricity sector to identify such opportunities. Together we can help to build the grid of the future, all while ensuring that SAFETY, security, sustainability, reliability and affordability remain top of mind.

Fire Intensity from 1990-2019 (hectares per fire) indicating the clear upwards trendline in the intensity of fires since 1990.

Source: CEA



Major and Significant Event Customer Hours of Interruptions (2015-2019)

Source: CEA

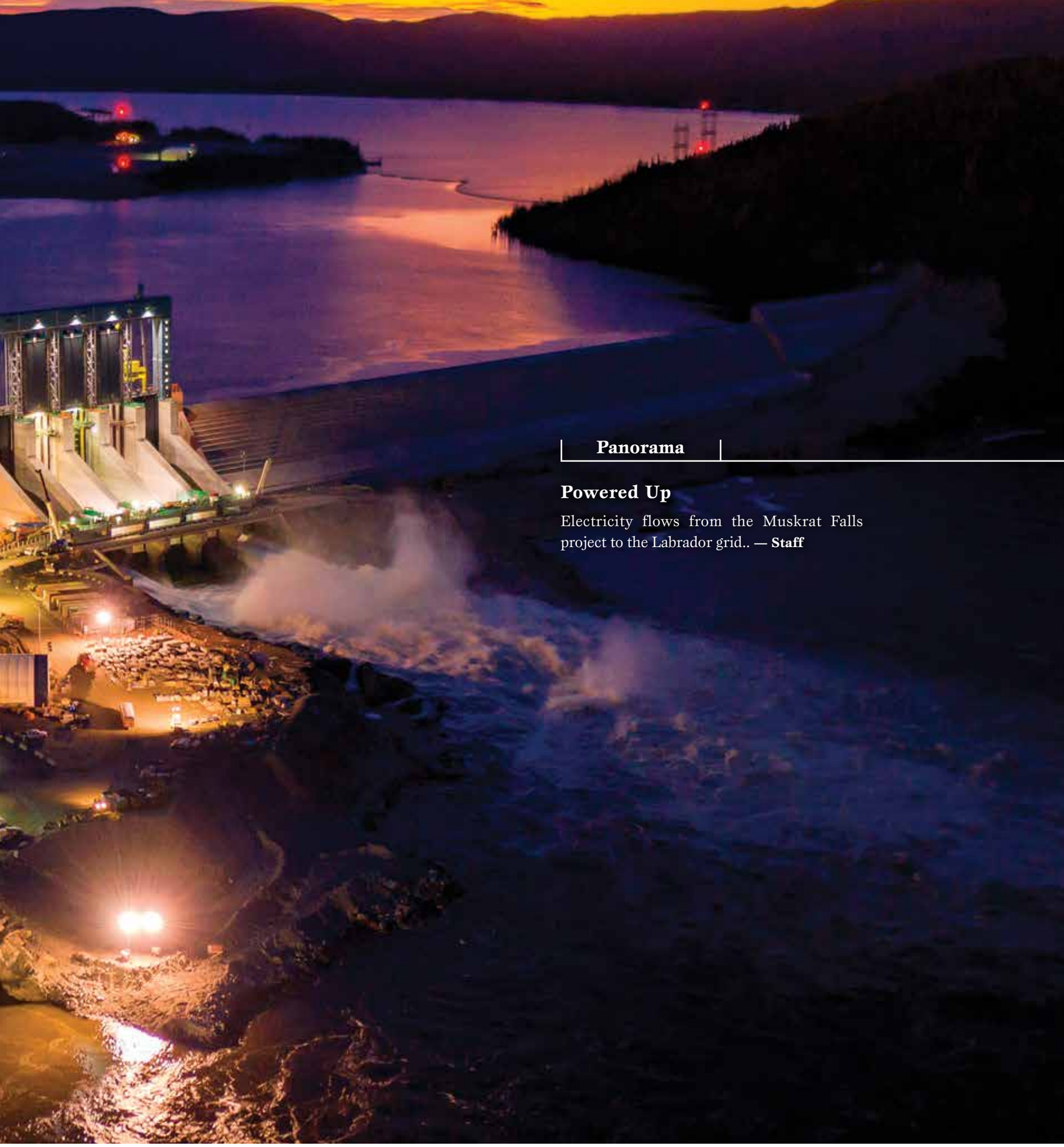
Justin Crewson is the director of transmission and distribution policy at the Canadian Electricity Association.

Dan Gent is the director of analytics at the Canadian Electricity Association.

Shahrzad Simab is the manager of climate change and clean energy at the Canadian Electricity Association.

Credit: Nalcor Energy

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



Panorama

Powered Up

Electricity flows from the Muskrat Falls project to the Labrador grid.. **— Staff**

FUNDING WATER INFRASTRUCTURE

Many federal programs are available to support municipal water, wastewater, and stormwater infrastructure.

What federal programs are available to help municipalities fund water infrastructure?

By Simran Chattha

All levels of government in Canada have been affected by the COVID-19 pandemic in some way, shape, or form since March 2020. This is especially true for municipalities across the country. As reported by Water Canada, the Federation of Canadian Municipalities (FCM) was calling for emergency funding for municipalities as early as April 2020 due to the economic impacts of COVID-19.

"From turning arenas into safe shelters to deferring property taxes, municipal leaders are working flat-out to support Canadians through this pandemic," said FCM President Bill Karsten. "But with new expenses, staggering drops in revenue and no freedom to run deficits, municipalities need emergency funding to keep essential services going strong."

In June 2019, conversations started to take place about what would be needed to support a safe economic restart across the country.

"We need to work together to pull Canadians out of this pandemic and come back even stronger," said Karsten. "There'll be no full economic recovery without tackling the municipal financial crisis first, and the Prime Minister has created an opening to do that. Now all orders of government need to seize this opportunity to get support to the front lines where it's so urgently needed."

As conversations about a safe economic restart have taken place, funding municipal infrastructure projects has been seen as a way to support the economic recovery in communities across Canada. The federal government has made a number of announcements about investments in drinking water, wastewater, and stormwater (more information is available on watercanada.net). Organizations like the Federation of Canadian Municipalities (FCM) and crown corporations like the Canada Infrastructure Bank (CIB) have also been supporting projects.

To explore current federal funding opportunities for municipal water infrastructure, Water Canada and the Canadian Water and Wastewater Association (CWWA), with support from Logistec, hosted the Window on Infrastructure webinar on September 16, 2020.

> Beyond the direct funding that is available, FCM also supports knowledge-sharing between municipalities.

A number of industry leaders joined the webinar including:

- Carl Bodimeade from Hatch Infrastructure.
- John Cuddihy, Natasha Faruqui, and Katie Hogan from Infrastructure Canada.

- Patrick Kehoe and Matt Gemmell from the Federation of Canadian Municipalities (FCM).
- Sashen Guneratna from the Canada Infrastructure Bank (CIB).
- Hiran Sandanayake from the City of Ottawa.
- Indra Maharjan from the Ontario Clean Water Agency (OCWA).

Government of Canada's Investing in Canada Infrastructure Program (ICIP)

John Cuddihy, Natasha Faruqui, and Katie Hogan from Infrastructure Canada kicked off the Window on Infrastructure by providing some information about the Investing in Canada Infrastructure Program (ICIP) and how it has been adapted as a result of COVID-19.

Hogan provided an overview of the Investing in Canada Plan. According to Hogan, over $180-billion is expected to be invested into the program 12 years. She noted that the Investing in Canada Infrastructure Program (ICIP) is the flagship program under the Investing in Canada Plan and it is divided into four streams:

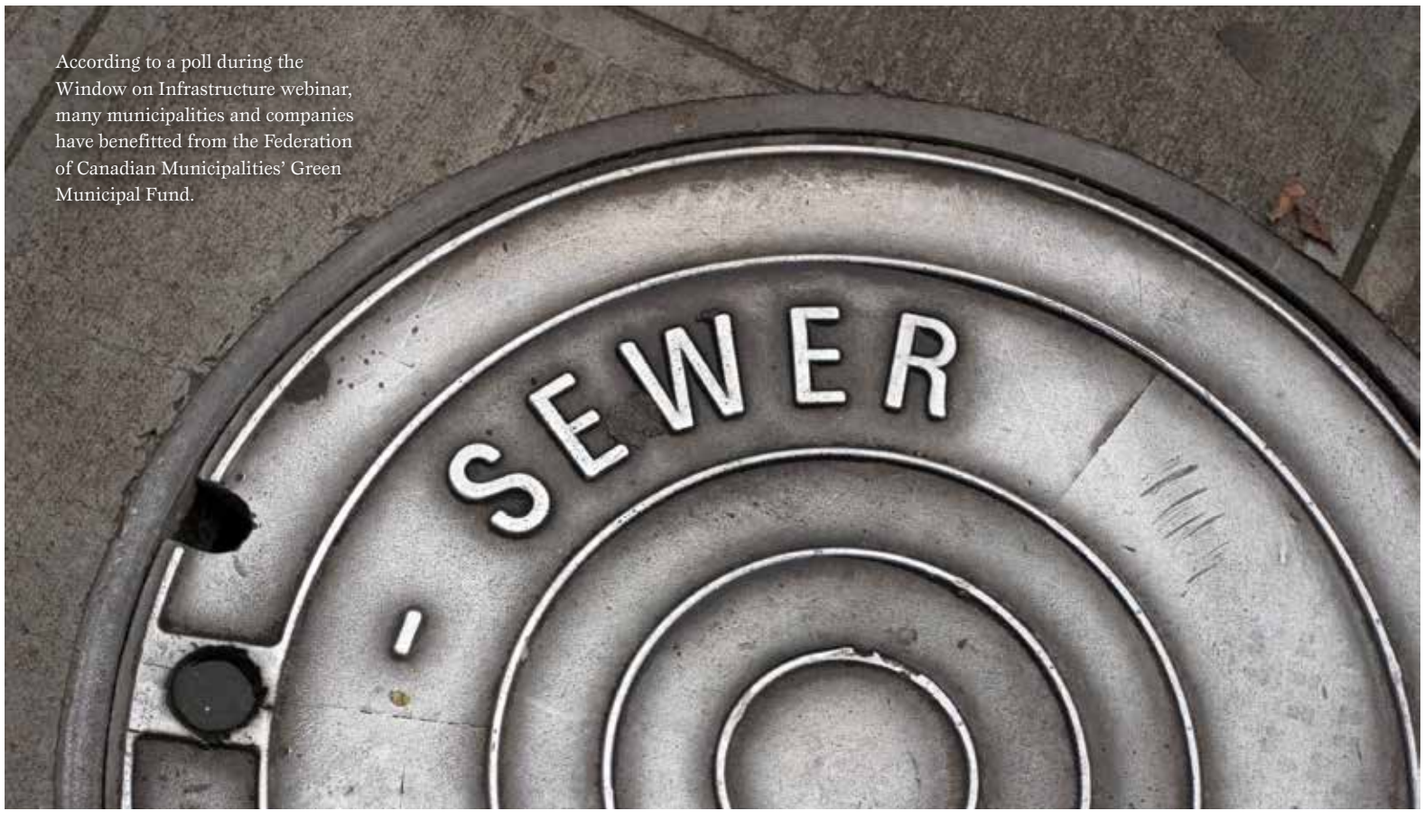
1. Public transit stream, which has $20.1-billion allocated for projects.
2. Green infrastructure stream, which has $9.2-billion allocated for projects.
3. Community, culture, and recreation stream, which has $1.3-billion allocated for projects.
4. Rural and northern communities' stream, which has $2.4-billion allocated towards for projects.

"The Investing in Canada Infrastructure program is an outcomes-based eligibility model," noted Hogan. "It basically moves the vessel away from a traditional asset-based model. The water and wastewater context is the perfect example to think about how that outcomes-based approach can help identify more innovative projects to do in your local communities."

"Under a traditional asset-based eligibility model, we would be looking for water and wastewater investments," added Hogan. "We would be looking at the standard pipes, pumps, treatment stations, and things like that. Under an outcomes-based eligibility model, we've identified the outcomes as being increased capacity to treat and manage wastewater and stormwater, and increased access to potable water."

"Thinking about the outcomes-based model, if that's the overall outcome we want to achieve, the federal government is not being prescriptive about how you achieve that," noted Hogan. "We could really be looking at innovative types of solutions for water purification and stormwater management that would not have otherwise fit in a very restricted asset class-based model."

In March 2020, the federal government started thinking about how it could help communities respond to the COVID-19 pandemic. The Investing in Canada Infrastructure Program was adapted in two ways: a fifth funding stream (COVID-19 Resilience Infrastructure) was created and eligibility was temporarily expanded for three of the four existing streams.



According to a poll during the Window on Infrastructure webinar, many municipalities and companies have benefitted from the Federation of Canadian Municipalities' Green Municipal Fund.

NEED FOR ADDITIONAL FEDERAL FUNDING SUPPORT

What type of water infrastructure is in the greatest need of additional federal funding support?

Wastewater 56.7%
Drinking Water 26.7%
Stormwater 13.3%
Water Conservation 3.3%

Has your municipality/company has benefited from funding available through the Green Municipal Fund?

Yes 58.8%
No 41.2%

Would you consider approaching the Canada Infrastructure Bank to secure funding for a water infrastructure project?

Yes 35%
No 5%
I don't know enough about the bank 60%

Federation of Canadian Municipalities' (FCM) Green Municipal Fund

Patrick Kehoe, an advisor at FCM, provided an update on the support that is available to municipalities through the well-known Green Municipal Fund.

"The support comes in two ways: there is the direct funding aspect of it and there is a resource end to it," said Kehoe. "[There are] tools, instances for providing peer-to-peer support, and learning from others around the country to spur their projects."

The funding has been targeted to environmental sustainability projects and most of these have been infrastructure projects, according to Kehoe. This has helped inform the funding streams (energy, water, land use/brownfields, waste, and transportation) that have been offered by FCM.

"We like to fund projects at different stages," said Kehoe. "We start out by providing grant funding for feasibility studies. This will cover up to 50 per cent of eligible costs to a maximum of $175,000. […] Next up are pilot projects that test out real-world solutions on a small scale. This again is grant-based and is up to $500,000. Typically, [we cover] about 50 per cent of eligible costs. However, municipalities under 20,000, so smaller municipalities, can request up to 80 per cent funding."

"Finally, we do have our capital project financing," added Kehoe. "The capital projects financing is based on combination of low-interest loans and grants. Typically, we are able to cover up to 80 per cent of project costs up to a maximum of $10 million. However, we do consider larger amounts so don't let that be a barrier."

> Under an outcomes-based eligibility model, we've identified the outcomes as being increased capacity to treat and manage wastewater and stormwater

Beyond the direct funding that is available, FCM also supports knowledge-sharing between municipalities. Best practices and lessons learned can be accessed at *fcm.ca/resources*

Individuals can also access the funded projects database, which has information about projects FCM has funded over the last 20 years, on FCM's website.

Opportunities to advance water infrastructure through the Canada Infrastructure Bank (CIB)

The CIB is a federal crown corporation that has three core functions, according to Sashen Guneratna. These core functions include: investing, advising, and knowledge.

The CIB has the ability to "invest in new, revenue-generating infrastructure using project-specific structures that attract private capital and appropriately allocate risks," according to Guneratna. In addition to this, the CIB is able to "advise public sector sponsors about project development, effective project structuring options, private sector, and CIB investment options." The CIB is also able to "collect and develop data and knowledge, facilitate evidence-based decision making."

Guneratna noted that the CIB has played an active advisory role in water infrastructure projects. "We've had a lot of conversations with municipalities," said Guneratna. "We can assess projects at no-cost and evaluate these projects at no-cost. We're also able to help with structuring debt equity, help look at financial models, and provide advice to municipalities on their projects."

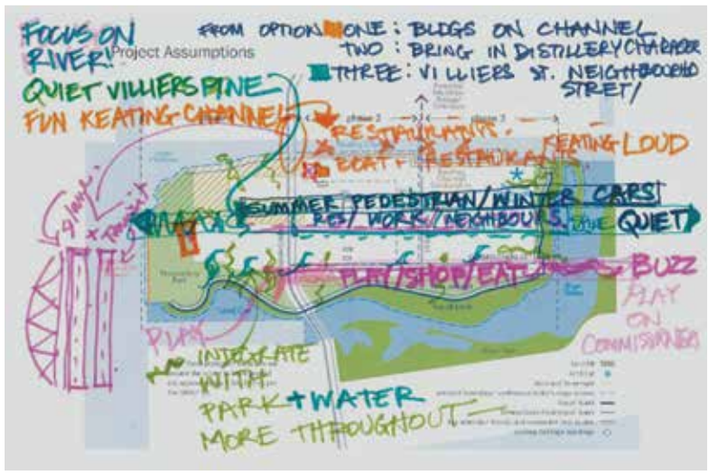
In the context of municipal water and wastewater projects, Guneratna spoke about two challenges municipalities face and how the CIB can help address those challenges. One challenge Guneratna noted was that "municipalities are often close to reaching existing debt limits, restricting their ability to invest the significant capital required for replacement, growth, or compliance." Also, municipalities with a "small tax and/or rate base cannot absorb increases caused by large investments."

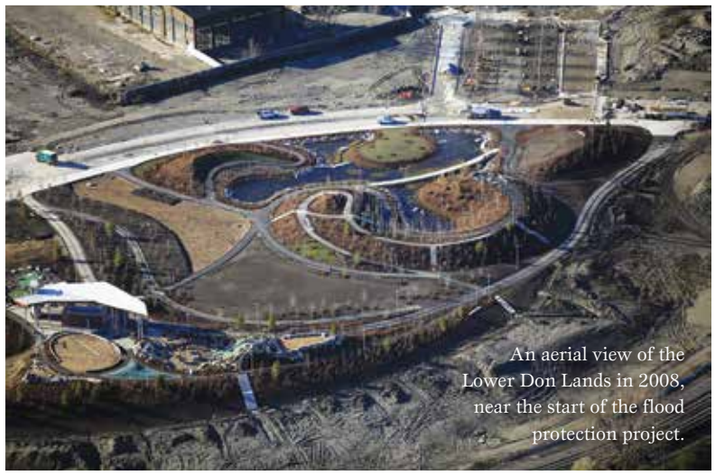
In order to help address these challenges, the CIB can work with the municipality to attract private investment that provides "flexible terms to accommodate longer duration and complex projects that would not otherwise be commercially available." The CIB can also help municipalities attract private investment that provides "access to direct debt financing rates to help contribute to both the financial and environmental sustainability of water and wastewater networks." While there is no opportunity that will guarantee federal funding for a project, the government has provided a plethora of options for municipalities to obtain the support needed for all types of new and rehabilitated community water infrastructure assets.

Simran Chattha is the associate editor of ReNew Canada.

After years of community consultation, the final design of the Port Lands was released, with commercial and residential opportunities and new public parkland.

All photos: Waterfront Toronto





An aerial view of the Lower Don Lands in 2008, near the start of the flood protection project.

PROTECTING THE PORT LANDS

Keeping the Don Lands above water in the wake of increasing flood risk.

By Mira Schenker

It's been 15 years since the Port Lands Flood Protection project officially began, with an Environmental Assessment (EA) to study how best to restore the natural mouth of the Don River. But that's just a blip in the life of this 38-kilometre river. Going back as far as 7,000 years, this river was a gathering place for Indigenous peoples, and a source of food and water.

Waterfront Toronto's role in this story officially started 2005 with the Don Mouth Naturalization and Port Lands Flood Protection EA. A joint study with Toronto and Region Conservation Authority (TRCA), the goal was to renaturalize the river mouth and protect the Port Lands and surrounding neighbourhoods from flooding in the event of a Regulatory Storm—all within an urban context. Flood protection was core to Waterfront Toronto's mandate from the time it was created by three orders of government in 2001. The first phase of flood protection stemmed from an environmental assessment for the West Don Lands completed in 2005 in partnership with TRCA and City of Toronto. By building a flood protection landform under Corktown Common and lengthening of the Metrolinx railway crossing over the Don River, Waterfront Toronto and its partners protected a large swath of downtown Toronto from riverine flooding, allowing a master planned community in West Don Lands to take shape.

The next stage of flood protection was in the Port Lands, where flooding from the Don River puts approximately 290 hectares of land at risk. This represents nearly one third of the 800-hectare area Waterfront Toronto is tasked with revitalizing. Neighbourhoods like the Canary District in the West Don Lands are envisioned for the Port Lands once flood protection is complete in 2024.

How did we get here?

In 1912, the Board of the Toronto Harbour Commission completed a plan to transform Ashbridges Bay Marsh into a massive industrial district. By 1922, the marsh had been filled in to create more than 200 hectares of land, with another 200 hectares soon to follow. The Keating Channel was built along the northern edge of the former marsh in the late 1890s. The mouth of the Don River was redirected into the concrete

lining of the Keating Channel, sending the river out into the inner harbour through a 90-degree turn. Over 100 years, the area was filled in to create what we now know as the Port Lands. This transformation from a large coastal wetland to a hard, channelized river and low-lying in-fill has left the Port Lands and surrounding area vulnerable to flooding from the Don River.

Starting in the 1950s, a second wave of development began. The Leslie Spit was built, as well as the Hearn Generating Station and the Commissioners Incinerator. The Gardiner Expressway was built in the 1950s over the mouth of the Don River. The opening of the St. Lawrence Seaway ignited a renewed effort to turn the Port Lands into a major shipping hub and industrial district. These aspirations never materialized and by the 1980s, the Port Lands remained underutilized but contaminated by a legacy of historical industrial activities. The area had become home primarily to civic and city-serving uses such as salt storage, as well as light industrial uses.

Port Lands project rendering.

In 1989, a citizen-led task force began pushing for a re-naturalization of the Don River. The Task Force to Bring Back the Don sketched out the first vision of how the river could be revived. This recommendation from the Task Force was reinforced in 1992 with the release of Regeneration: Royal Commission on the Future of the Toronto Waterfront, which included recommendations for environmental enhancements and flood protection at the Don River mouth.

A 15-year timeline

In 2005, we began the process to establish the Terms of Reference process for the Don Mouth Naturalization and Port Lands Flood Protection Environmental Assessment (DMNP EA). This set the conditions of the EA.

> By the 1980s, the Port Lands remained underutilized but contaminated by a legacy of historical industrial activities.

In September 2006, the Ontario Ministry of Environment and Climate Change approved the Terms of Reference for the DMNP EA and the study formally began.

In 2007, Waterfront Toronto launched an international design competition to create a concept design that included habitat creation and flood protection fully integrated in a comprehensive plan for addressing urban design, transportation, naturalization, sustainability, and other ecological issues. This involved an extensive public consultation process and a week-long public exhibition. The winning design is by Michael Van Valkenburgh Associates. This provided the framework for what would become the preferred alternative through the DMNP EA.

In 2011, Toronto City Council adopted what would later be called the Port Lands Acceleration Initiative (PLAI). The goal of the initiative was to retain the core ideas behind the DMNP EA while developing strategies for accelerating revitalization in the Port Lands. This plan was refined in 2012 and became known as PLAI 2, which included the Port Lands Planning Framework, Villiers Island Precinct Plan and Port Lands, and South of Eastern Transportation and Servicing Master Plan Environmental Assessment.

In 2014, the Lower Don Lands Master Plan Environmental Assessment was approved.

In 2015, the Don Mouth Naturalization and Port Lands Flood Protection Environmental Assessment was approved.

In May 2015, work began on the Due Diligence Report for Port Lands Flood Protection.

In October 2016, the Due Diligence Report for the Port Lands Flood Protection Project was completed, providing governments with additional assurance on the cost of this project, ways to mitigate the risks, and a strategy and schedule for executing the project. The first piece of work as part of Port Lands Flood Protection, Cherry Street Lakefilling, received tri-government funding in 2016 through the Clean Water and Wastewater Fund

In June 2017, $1.25 billion in municipal, provincial and federal funding was awarded to the Port Lands Flood Protection Project.

In October 2017, the Port Lands Planning Framework and Villiers Island Precinct Plan were adopted by Toronto City Council.

Construction on the full Port Lands Flood Protection project began in December 2017. This ambitious undertaking is slated for completion in 2024. Cherry Street Lakefilling was completed in 2019. And with excavation on the river valley well underway and the first of four new bridges slated to be installed in October 2020, this project is on track.

Mira Schenker is the senior manager, communications and public engagement, at Waterfront Toronto and a former editor of this publication.

The introduction of a universal permitting system would allow for contractors and municipalities to remove time and frustration from the process.

SOLUTION PERMITTED?

Fixing an issue impacting contractor relations with municipalities.

By Richard Lyall and Arash Shahi

An innovative new initiative has been launched to develop guidelines for a uniform e-permitting system that can be used by municipal planning and building departments across Ontario.

The project, called One Ontario, is important because e-permitting solutions used by municipalities are often fragmented and varied, which poses communication issues for builders and agencies.

AECO Innovation Lab and the Residential Construction Council of Ontario, which represents builders across the province, are working with other influential groups in the industry on the venture.

The Ontario Building Officials Association, which represents building officials from more than 400 municipalities, is also part of the coalition, as is the Toronto BIM Community (tBIMc). We expect more organizations to sign on as the project progresses.

In a nutshell, we are seeking to change the industry by focusing on digital technology, specifically e-permitting.

A common, streamlined digital framework will reduce the cost of redundant customization in every municipality and result in faster building approvals and a more efficient system that would increase the supply of housing. It would link with approval agencies, thereby improving the workflow.

Such a framework is better for municipalities and provincial agencies because it will lead to lower costs and more efficiencies, improve regulatory compliance, and result in higher-quality applications results, additional and more affordable housing as data harmonization reduces regulatory delays, and increased municipal tax revenues as projects move more quickly from design to construction.

For the AEC industry, it will allow meaningful input into the permitting and approval process, faster development and building approvals, increased visibility and certainty around permitting, and approval processes, and improved industry productivity.

This is an exciting venture as delays in obtaining permits can increase house prices by adding tens of thousands of dollars in costs to a building. There is also tremendous tax revenue lost due to delays in construction of homes, especially high-density buildings. That alone is a good reason for the initiative.

The partnership between AECO, which consists of seasoned engineers, finance and business development consultants, with residential builders, building officials, and the BIM community, is ideal, as we all realize the value of setting the stage for a common framework to be used across Ontario.

We are breaking new ground with this venture, as there are presently no common standards to govern the flow of information and data transfer among stakeholders of permit applications. In the absence of such standards, permitting systems used by municipalities can vary greatly between jurisdictions, causing communication issues for provincial agencies that must deal with them and other approval bodies such as conservation authorities and source water protection officials.

To their credit, some municipalities are gradually adopting e-permitting systems, but there are still numerous challenges and missed opportunities due to inadequate frameworks for data and information exchange, incompatible software systems, and lack of digitally skilled talent with municipal expertise.

We feel there is a need for a unified data exchange standard that would harmonize the entire development approval process and significantly reduce the cost of redundant customization in every municipality.

A harmonized and transparent platform will ensure that everybody is singing off the same song sheet, which will enable

municipalities, builders and provincial agencies to move projects along much quicker.

Specifically, such a platform will enable the creation of universal standards for data exchange, information sharing and e-permitting, connect with Building Information Modelling (BIM) and Geographic Information System (GIS) mapping to streamline paper-based processes, and create a roadmap to help municipalities transition from traditional permitting into a fully integrated e-permitting system.

This will allow designers, permit applicants, and plans examiners to be connected through an electronic platform. Builders will be able to complete site reviews remotely using technology applications and digital inspection resources, making for a smoother permitting process. Vendors and developers will benefit because the data exchange framework will be the same in every municipality. Standardized data will also provide useful information to support evidence-based land-use planning.

In the end, the research will enable us to create specifying standards that can be used by all municipalities along with a roadmap to help Ontario municipalities move to a fully integrated e-permitting framework. The standards would be aligned with regulatory requirements in the province and be informed by the technological tools and advancements within the AEC industries, including web-based GIS applications, BIM tools, and automated code compliance checking algorithms.

COVID-19 has shown us how digitization can help improve our lives, so the timing of this initiative couldn't be better. It also comes at a critical time, as there is a dire need to speed-up the approval process because the supply of new homes being built across Ontario just isn't keeping up with demand.

A research report done by RESCON indicated a big reason for the housing shortage is that the supply chain in the GTA is mired in red tape. The report recommended that Ontario's 444 municipalities move out of the world of pen and paper and adopt an interconnected, state-of-the-art digital e-permitting platform.

The fact of the matter is that Ontario needs to build 75,000 new homes per year over the next 24 years just to keep up with expected population growth. However, the supply chain is short 12,000 units per year on average. Zoning delays can take up to three years and residential site plan approvals can take an additional two years in the permitting process, so it's clear improvements are needed.

The work being done by this coalition will take a lot of time and effort. It's a big task and will entail assembling chief building officials from municipalities across the province to participate in the research and development effort. However, the rewards will be well worth the effort.

The initiative will provide a long-overdue boost to the productivity of the building industry. Instead of a patchwork of systems, municipalities across the province will have a blueprint for a fully integrated e-permitting framework that will reduce redundancies and inefficiencies and lead to a better future.

Richard Lyall is the president of RESCON.

Arash Shahi is CEO of AECO Innovation Lab.

In the lab at the University of Ottawa for testing of new permeable pavement technology.

All photos: PurePave

NEXTGEN PAVING

New permeable paving solutions helping to mitigate issues surrounding grey infrastructure.

By Mark Wessel

In North American cities, roads take up a staggering 80 percent of public space. Hard surfaces (with roads and rooftops combined) account for over 50 percent of the urban footprint, reaching up to 70 percent in industrial areas. Meanwhile last year Environment Minister Catherine Mckenna made the observation that 100-year storms are now happening as frequently as every five years; and as often as every two years in some parts of the country.

That toxic combination of surfaces and storms is contributing to unprecedented flooding. So much so that according to the World Resources Institute (as reported in an April 2020 Globe and Mail article) while flood damage to urban areas, including homes, businesses and public infrastructure totalled a whopping US$2.4-billion in 2010, it could get closer to US$6.6-billion by 2030 "if current mitigation efforts don't change."

Designing for the Future

Reading between the lines: we can no longer take the same approach to climate change, while expecting different results. It's a mindset that Craig Applegath, an architect and founding principal of Dialogue Design wholeheartedly embraces. "As someone who is focussed on sustainable architecture, I believe what we need to be thinking about is how to deal with a greater frequency of storms that are more severe. Whatever we design has to have greater resilience, meeting our needs not just now, but five, 10, 20 years down the road."

Applegath says we should make extensive use of landscaping to reclaim green space for cities—with more plants and trees that can capture the water. But he also says municipalities need to reduce the longstanding incidence of water sheeting over hard surfaces. "So when we're looking at laneways and roads, the question we should ask is how can we use permeable paving to allow water to quickly percolate through the surface?"

One solution Applegath sees as a fit for a community college campus his firm is helping to design, is a new generation of permeable paving from Ottawa-based PurePave Technologies, which could be used onsite for such surfaces as parking spaces, walkways, and public spaces in order to ensure any rainfall filters through to the adjacent trees and plants.

Creating a Sponge City

Apart from trees and vegetation, Mark Palmer, the executive director of Collingwood-

based Greenland Group of Companies, sees incorporating a combination of permeable surfaces and green roof technology to lessen the impact of flooding. "When you look at the whole premise of creating a sponge city from a design standpoint, permeable surfaces (including pavement systems), makes sense for large parking lots at schools, transportation hubs and commercial developments. We should also look at these systems in tandem with building stormwater controls, such as green roof technologies and retaining stormwater on-site for as long as possible."

This strategy of trying to absorb rainfall rather than convey it somewhere else is also a strategy shared by Kristina Hausmanis, the project manager for Green Streets at the City of Toronto. Her group is studying how various permeable surfaces can help reduce the impact of flooding and stormwater runoff. "We're no longer looking at quickly getting rid of water downstream, but instead trying to capitalize on absorbing it where it falls. Which means you have to have the right construction for infiltration or ways of holding the water so that it can be used by trees or other vegetation."

From the Green Streets Toronto perspective, rainwater isn't just perceived as an obstacle, but rather a natural resource that should be harvested in support of the city's ambitious plan to grow its tree canopy to 40 per cent by 2050. As part of ongoing efforts to both plant new trees and improve the survival rate of existing ones, they're investigating permeable surface options for such applications as tree pits and walkways.

Advancements in permeable pavements have made it a viable material to use to pave pool decks, parking lots, driveways, and trails.

The Case for Canopies

The catalyst for Toronto's canopy growth program and other cities such as Melbourne, which has an even more aggressive goal of achieving a 40 per cent canopy by 2040, can be directly attributed to the heat island effect major cities around the world are now experiencing, in which downtown temperatures are spiking during the warmer months. Spikes that are contributing to heat strokes and heat-related deaths that disproportionately affect the most vulnerable city residents. Unsurprisingly, asphalt and concrete roads amplify this problem.

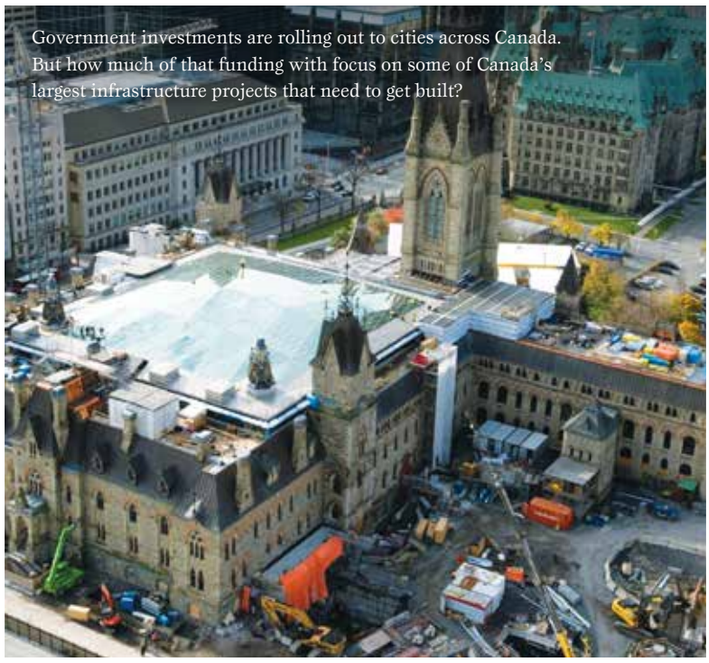
Recognizing the unique cooling effect of trees, urban forest maintenance and preservation is top of mind with cities such as Calgary, which has over 4,000 trees in the downtown core alone. Calgary recently embarked on a tree pit project using permeable pavements and Gatineau has gone a step further, using the technology both for tree pits and for the adjacent sidewalk, so that instead of rainwater pooling and creating a hazard for pedestrians it is absorbed and redistributed to local trees and vegetation.

Strength and related maintenance costs are another key consideration and this helps to explain why permeable paving solutions have flown below the radar of infrastructure professionals in North America up until now. Thirty years ago, UK-based Addagrip helped to pioneer an entirely new permeable paving solution, mixing a blend of aggregates (finely crushed stones) with a resin, to produce a porous surface. But it wasn't ideal for North America's northern climes because the bonding agent couldn't support vehicular traffic and withstand the harsh freeze thaws that are all too common here. Similarly, asphalt, concrete, permeable paving, or permeable concrete have always been prone to deterioration in the face of wild weather swings as well.

Earlier this year, the University of Ottawa determined that even after a rigorous, 40-cycle freeze-thaw test in which samples were first placed in a freezer at -40° for an hour, before transferring them into an isolated room with a temperature of 30° for an hour: the surfaces retained a flexural strength of 6.1 MPa (62.2 kg/cm^2) or six times the strength of asphalt at room temperature. It's the first time the university has tested a surface in this manner, without observing any degradation in flexural strength. It's an important advancement in the use of permeable pavements in cold-weather climates.

This combination of strength and porosity opens up a whole new range of possibilities for infrastructure professionals interested in finding new ways to keep water in place while greening and cooling our cities.

Mark Wessel is an urban journalist based in Collingwood, Ont.



Government investments are rolling out to cities across Canada. But how much of that funding with focus on some of Canada's largest infrastructure projects that need to get built?

Top100 Canada's Biggest Infrastructure Projects

Don't forget to watch for the January/February edition of ReNew Canada for the 2021 Top100 Projects report.

Before the pandemic, several provinces were already committing record investments to health care infrastructure. The emergence of COVID-19 has only increased the desire for some provinces to invest.

Credit: B.C. Ministry of Health

TOP100 PROJECTS PREVIEW

The biggest trends impacting megaproject development in Canada.

By Andrew Macklin

Each year, we take two pages in our November/December edition to talk about some of the particular notes to take under advisement ahead of the release of the annual Top100 Projects report. We usually focus on a handful of individual projects that are straddling the fine line between inclusion and exclusion.

But this year we want to take a slightly different approach. After all, this hasn't exactly been a typical year, so why would we follow a typical approach?

Instead, we wanted to break this down into themes, appreciating the key drivers that are impacting the development of infrastructure megaprojects.

The impact of COVID-19

The pandemic caused a blip in the timeline for the construction of infrastructure megaprojects. Some more than other of course, as projects were either shut down or had staffing reductions for days, weeks, or months depending on the given project.

Ultimately, we will not know the true impact of the delays until we reach substantial completion on these projects, and compare the original date set to the actual date of completion. Not to mention that contractors across Canada have taken significant steps to reduce or eliminate any delays cause by COVID-19. However, we do expect to see at least projects that, had the COVID-19 pandemic hit, would have been completed and off of our 2021 report list.

The real cost of the pandemic

The pandemic did more than increase the length of time some infrastructure megaprojects will take to get built, it also impacted the cost of the projects. With increased costs for sanitization, Personal Protective Equipment (PPE), and jobsite spacing requirements for workers, no project's budget will stay the same.

The question will be when those true costs can be appreciated. We may not see any costs go up in the 2021 edition of the report, but the numbers could change in the years ahead. It will depend on how much work project owners have done to calculate these new costs over the course of the project construction.

Are cities still spending?

The devastating financial impact of the pandemic on Canadian municipalities has been well documented. Federal and provincial funding is starting to reach those communities, allowing most cities to start planning again for the future.

Many of Canada's major cities have at least one or two infrastructure megaprojects in the design or procurement phase. But if the municipal funding can no longer be afforded, even when provincial and federal funding is present, how long will these projects be delayed?

Spending more on health care

Six provinces had health care projects included in last year's report, as record national investment in the sector reached new heights.

B.C., Alberta, Ontario, and Quebec all had health care projects in the early stages of design and development when our 2020 report landed last January, and progress has continued despite the financial realities faced during the pandemic.

With health care an even greater priority across the country as a result of the outbreak of COVID-19, how quickly will government get these projects to market to provide greater support for the system?

Accelerating timelines

Speaking of getting projects to market quicker, that's exactly what the Government of Ontario has committed to doing as part of its fall legislative agenda. In a release from September 14, the provide stated it's a priority to accelerate "the construction of critical highway, transit and broadband infrastructure projects to create jobs and boost the local economies of communities across Ontario."

In the months to follow, it will become clear which infrastructure megaprojects will be accelerated and how that will impact the project pipeline in the province.

Fall government agendas

As federal funding rolls out to help support infrastructure development across Canada, we can expect to see a dearth of new project commitments from the provinces and territories as part of their fall legislative agendas. Every province and territory, with the exception of PEI, has at least one infrastructure megaproject in the planning stages, one that could be elevated to the forefront of the infrastructure agenda should funding be available and it provide support to help rebuild the economy.

In particular, it's worth paying even closed attention to what gets announced in Saskatchewan and British Columbia. Both of those provinces head to the polls in 2021.

Support from the bank

For those projects missing the additional funding needed to move forward with procurement, the Canada Infrastructure Bank (CIB) provides an alternative for securing the remaining dollars.

We have seen the impact that CIB can have in pushing projects towards the start of construction, as illustrated with what happened with REM project in Montreal. It is also widely known that the CIB has been doing its due diligence on a number of infrastructure projects throughout 2020, and investment announcements could land at any moment.

Now that project owners are beginning to better appreciate the opportunities provided by the Bank, how many infrastructure megaprojects will have its support in order to begin construction in the near term?

Private investment in energy

The lack of a federal strategy for the electrification of the economy is slowing down large-scale investment in the energy sector, but not grinding it to a halt. Nuclear refurbishments, large-scale renewables and new and rehabilitated hydropower projects continue to drive tens of billions in investments in the Canadian market.

The question is: how much will that change once a commitment is made to build the robust electricity market that includes a national EV network and remove all communities off of diesel generation? It will certainly change the hydropower landscape, as refurbishment projects will look to add further capacity where available, and a further uptick in large-scale renewables in remote regions help meet the demand for clean power.

Roads to resources

We've seen resource companies step up to provide financial support for transportation projects that help bring Canadian metals to market, and we can expect to see more of it. Primarily this has happened in Northern Canada with such projects as the Yukon Resource Gateway Project and the Tlicho All-Season Road. But with the Ring of Fire development in Ontario and the Plan Nord in Quebec moving forward, several more transportation infrastructure megaprojects that provide routes for resources could quickly progress towards construction.

Andrew Macklin is the managing editor of ReNew Canada.

What other key industry trends do you think are impacting infrastructure megaproject development in Canada?

Let us know your thoughts by dropping me an email to **andrew@actualmedia.ca**


Credit: OPG

Top100 Canada's Biggest Infrastructure Projects

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

Major Milestone Reached for Darlington Refurbishment Project

2020 Top100 Projects Rank: 3
Value: $12.8 billion

Ontario Power Generation (OPG) has reached a significant milestone with work now underway on refurbishing Unit 3 of the Darlington Nuclear Generating Station following the unit's safe shutdown.

"This enormous clean energy project will play a significant role in Ontario's fight against climate change by providing 30-plus years of clean, low-cost and reliable power for Ontarians," said Ken Hartwick, president and CEO of OPG. "The start of Unit 3 refurbishment reflects the Province's confidence in our project team's ability to build on its success to date and complete this next phase of the project."

In October 2016, OPG and project partners began execution of the Darlington refurbishment project. Following more than three years of work on Unit 2, the project team successfully completed the unit's refurbishment and returned it to commercial service in June 2020, amid the unexpected challenges of the COVID-19 pandemic.

In response to the pandemic, OPG postponed the commencement of the Unit 3 refurbishment from its scheduled start in May 2020. Now that the Unit 3 reactor was safely shut down on July 30, and disconnected from Ontario's electricity grid, workers will use remote-controlled tooling to remove 6,240 fuel bundles from the unit over the next three months and place them in water-filled fuel bays for up to 10 years of safe storage.

Refurbishing the Darlington Nuclear Generating Station, one of Canada's largest clean energy infrastructure projects, is critical in the province's efforts to combat climate change. An independent report prepared by Intrinsik Environmental Sciences noted the continued operation of the refurbished station to 2055 will equal removing two million cars per year from Ontario's roads by avoiding significant greenhouse gas emissions.

The 10-year project is expected to generate a total of nearly $90 billion in economic benefits for Ontario and increase employment by an average of 14,200 jobs annually across the province. The four-unit station currently generates over 20 per cent of Ontario's electricity, or enough energy to power two million homes.

The project is scheduled for completion by the end of 2026.

YVR Core Program Halted at Vancouver Airport

2020 Top100 Projects Rank: 37
Value: $1.7 billion

Vancouver Airport Authority announced in September its intention to terminate the CORE Program, part of the multi-year capital program to modernize the airport.

This decision is a direct result of the unprecedented effect that the global COVID-19 pandemic has had on the aviation industry and further evidence of the Airport Authority's commitment to fiscal responsibility. Vancouver Airport Authority is prioritizing its resources on more immediate infrastructure and health and safety needs.

The CORE Program was designed when YVR was experiencing double digit growth and included a new central utilities building, geo-thermal heating and cooling system and a ground transportation centre including a new parkade. Due to the ongoing decline of air travel, YVR no longer has the immediate need for the additional capacity in utilities or parking. YVR's current systems will support the parking and utility needs of passengers for the foreseeable future.

The adjustment of the capital program is the latest in a number of steps taken by Vancouver Airport Authority to reduce operating and capital costs to protect the long-term financial health of the airport. The airport authority entered the pandemic on strong financial footing and continues to have one of the highest credit ratings of any airport in North America. The organization will now focus its financial resources on projects that support the recovery and restart of aviation, including trials for health screening and testing. Additionally, it will improve data and technology infrastructure, enhance cargo facilities, and pursue projects that are best completed while the airport is less busy, such as airfield infrastructure.

Vrooman reached out to Geoff Smith, CEO of EllisDon Corporation yesterday to give notice of the Airport Authority's intention to terminate the CORE program. Vancouver Airport Authority and EllisDon will work together to finalize wind down arrangements with the intent that all work will be concluded on the site by November 30, 2020. The project will be halted in its current state and can be restarted when the need arises.

APPOINTED

Michael Lindsay

Infrastructure Ontario (IO) has named **Michael Lindsay** as its new president and chief executive officer.

Lindsay is currently in the midst of his second tenure with IO. Lindsay served as president of project delivery before taking on his new role. He had previously served as the senior vice president of commercial projects at IO from 2014-2016. Before re-joining IO in 2019, Lindsay served as the head of strategic partnerships and government at the Investment Management Corporation of Ontario. He has held senior positions at Hatch, McKinsey and Co. and Queen's University.

Lindsay succeeds **Ehren Cory**, who is leaving IO after more eight years, including over three years as president and CEO.

Bob Alger

SNC-Lavalin Group Inc. has announced the appointment of **Robert (Bob) E. Alger**, former CEO of U.S. transportation contractor The Lane Construction Corporation, as President, Infrastructure Projects.

Alger brings extensive experience in the U.S. transportation and infrastructure sector, one of SNC-Lavalin's core markets, and key growth areas. During his 40-year tenure at The Lane Construction Corporation, including 18 years as president and CEO, he successfully delivered multiple $1-billion-plus mega projects as part of the company's successful expansion from a regional contractor to a nationwide provider. During his leadership, annual revenues increased six-fold to over US$2 billion.

As President of Infrastructure Projects, Alger will be responsible for continuing the run-down of the Company's LSTK projects, which are focused on several major Canadian transportation projects, and continuing to build SNC-Lavalin's pipeline of new business in the U.S. As part of that effort, he will be integral to the development and deployment of new contracting models that limit the risk associated with managing and delivering major projects.

JP Gladu

The First Nations Major Projects Coalition (FNMPC) of the Coast Salish Territory in Vancouver, British Columbia announced the appointment of **JP Gladu** as a strategic advisor.

Gladu is a member of the Sand Point First Nation in Ontario and was the former CEO of the Canadian Council for Aboriginal Business. His role within FNMPC will focus on expanding the organization's First Nation membership outside of British Columbia and will assist in broadening connections between FNMPC and members of the business community in Canada where common interests align.

"I've always been a fan and supporter of the First Nations Major Project Coalition. This leadership group is setting a higher standard in Canada in building infrastructure with Indigenous people and communities," said newly appointed Gladu. "I couldn't be prouder to step in the role as a strategic advisor, it truly aligns with my values."

Derrick Bragg

Andrew Furey, the new Premier of Newfoundland and Labrador, has named a new minister and deputy minister for the transportation and infrastructure portfolio.

Cory Grandy

Derrick Bragg is the new Minister of Transportation and Infrastructure, succeeding Steve Crocker, who shifts to the role of Minister of Justice and Government House Leader. Bragg was first elected in 2015 as the Member of the House of Assembly (MHA) for the riding Fogo Islands-Cape Freels. Following his re-election in the 2019 general election, Bragg was named Minister of Municipal Affairs and Environment by then-Premier Dwight Ball.

Deputy Minister of Transportation and Infrastructure, **Cory Grandy**, brings to his new role more than two decades of public service. In 2012, he was appointed as the Assistant Deputy Minister of the works branch in the Department of Transportation and Works. Following a departmental reorganization in 2017, he became the Assistant Deputy Minister of the new infrastructure branch leading the province's infrastructure portfolio including the planning, design and construction of education, health and justice facilities as well as infrastructure in support of the provincial transportation system.

Janet Gonzalez Tudor

Janet Gonzalez Tudor has accepted a new role as HDR's Transportation Operational Resiliency director. Gonzalez Tudor's responsibilities include working closely with clients and cross-functional teams in the development and implementation of new programs to support infrastructure resiliency planning and long term organizational health.

She will partner with the company's market and technical leaders to offer services that cover enterprise-wide needs including business and financial management, infrastructure planning and design, asset management and operation, stakeholder engagement, and more. The goal is to help clients prepare for and address threats from natural disasters as well as potential impacts due to disruptor events like the current pandemic and evolving social justice issues.

With over 15 years of diverse experience—including a dozen with HDR—Gonzalez Tudor offers a wide range of expertise in transportation infrastructure program management and early project planning and design oversight from her work on major transport programs.

Telling your story to the community is vital. But it doesn't always take the same standard approach to community engagement. For the Port Lands project, Waterfront Toronto turned to Rocky the Ripper for social media interaction with the community.

Credit: Waterfront Toronto/Vid Ingelevics/Ryan Walker

A NEW WAY TO ENGAGE

By Rocky the Rock Ripper

Hi there. My name is Rocky the Rock Ripper, and I was just an ordinary rock-ripping excavator bucket when I was asked to start tweeting about Waterfront Toronto's Port Lands Flood Protection Project last March. It seemed like a fun side project to show people behind the scenes of one of Canada's biggest infrastructure projects, so I figured out how to type. I tweet about how construction is progressing, the other machines on site, what we're building, and my random thoughts – all in between mouthfuls of delicious Port Lands soil and rocks. I don't mean to sound arrogant, but I've become a vital asset for building advocates and public support for this huge project.

Now you're probably wondering why a sophisticated organization like Waterfront Toronto would stick googly eyes on a piece of heavy machinery and let it loose on Twitter. I'm not entirely sure either – I'm definitely too sarcastic to be an effective corporate spokes-bucket. I also don't do anything except dig, and I never leave the Port Lands, so that's all I ever tweet about. Waterfront Toronto talks about the Port Lands too but they mix it in with all their other fancy projects, so I guess I'm your one-stop shop for the details on dirt. I'm also more fun to interact with (no offense, @WaterfrontTO) so people who are usually not interested in projects like this are more likely to follow me.

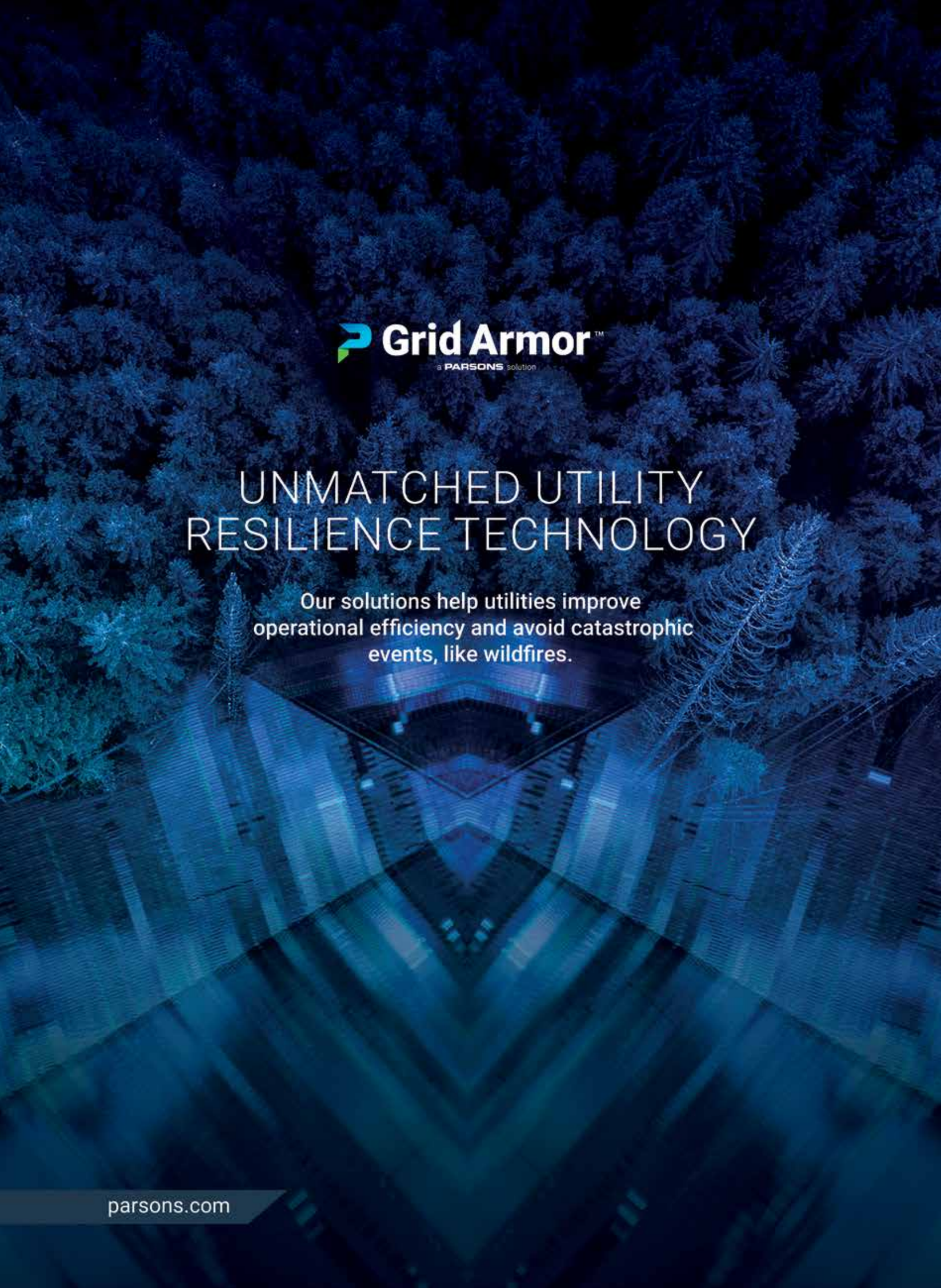
It's been a real wild ride so far. I met the Mayor of Toronto almost as soon as I started tweeting and I've met all kinds of interesting people on Twitter since. I haven't gone viral yet, but some of my posts have reached almost 10,000 people – some of them have never heard of the Port Lands, so I think that means I'm doing a good job.

I've faced some trolls too, and it's hard not to take it personally when some of my best ideas don't get very many likes; it's tricky to keep content fresh when I'm doing the same thing every day! I'm still figuring out what people want to hear about. Sometimes they have technical questions about the water column depth of the new mouth of the Don River, or how much soil weighs, but sometimes they just want to help me brainstorm names for my band.

One thing that people always like hearing about is how construction is progressing. I share #RockyRadar on a regular basis to show people how much we've excavated in the future river valley. By early September 2020 we had excavated more than 185,800 cubic metres of soil, and were more than 70 % finished the first section south of Commissioners St. between Munition St. and Cherry St. That's more than 74 Olympic-sized swimming pools of dirt.

We're also expecting to install the first bridge this fall. It will be pretty cool to have a front seat for that – the bridge is arriving by barge on the St. Lawrence Seaway and then they'll use a crane to place it on the bridge foundations. Hey, maybe I'll live-tweet it! (No promises though, we're still going to have digging to do that day). Make sure to follow me, *@TheRockRipper*, just in case.

Rocky is a professional rock ripping bucket at Waterfront Toronto, digging the new mouth of the Don River. Nature-lover. Rock-collector. Vegetarian. Never skips leg day.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