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JANUARY/FEBRUARY 2022



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Our 16th annual report on Canada's biggest infrastructure projects can be found inserted into the centre of this issue.

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

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For details regarding our annual celebration visit renewcanada.net/top100-projects



PROGRESSIVE P3 APPROACH

By John Tenpenny

Volution is natural progression. "Changes aren't permanent, but change is," to quote my favourite lyricist Neil Peart.

The way infrastructure is built is no different.

A recent example could be heard during Infrastructure Ontario's P3 Fall Market update, which saw IO president Michael Lindsay and Infrastructure Minister Kinga Surma speaking at The Empire Club in Toronto.

While it was reported that Infrastructure Ontario has a total of 13 projects in planning, 23 in pre-procurement and 15 in active procurement, valued at an estimated \$60 billion, it was also revealed that there is some new thinking about the way the province intends to deliver many of its largest and more complex projects.

According to Lindsay and Surma, four of the listed projects, specifically, will be delivered under a new progressive P3 model.

They explained the model will see the province and the project owner choose a private-sector development partner which will work with IO to define project requirements, design, pricing and risk, before entering into a final agreement.

"Our traditional public-private partnership models will continue to be the primary mechanism we use for project procurement and delivery," said Lindsay. "But there are several projects in our pipeline at the moment that call for approaches that are above and beyond the traditional, fixed-price, fixed-schedule approach. Whether because of their size or their complexity, those projects require new ways of working with our development partners to understand and mitigate risks."

The projects in line to use the progressive P3 model include The Ottawa Hospital—New Civic Redevelopment project, the Trillium Health Partners Broader Redevelopment—Mississauga Hospital Site, the Scarborough Subway Extension—Stations, Rail and Systems, and the Weeneebayko Area Health Authority—Health Campus in Moosonee.

"There are projects that given their innate characteristics call for a different approach," noted Lindsay. "When asked to build four long-term care facilities of quality as rapidly as we can, anybody I know who has been around the construction industry will appreciate that a fixed price or fixed schedule DBF or DBFM for those sorts of works just wasn't going to be the right model, so we created a modified approach."

A different approach is certainly welcome after recent projects ended up in court as governments and construction consortiums argued over unpaid bills and responsibility for outside events.

In Montreal, SNC-Lavalin and its consortium partners (Signature on the Saint Lawrence Group) filed a lawsuit last fall seeking \$378.7 million in compensation for what they say was the federal government's repeated failure to live up to its contractual obligation to collaborate and act in good faith during construction of the Champlain Bridge.

And last summer, LINK427, the group building Ontario's Highway 427 extension sued Infrastructure Ontario and the Ministry of Transportation, accusing the province of using last-minute delay tactics to avoid paying \$144 million plus another \$150 million in cost overruns. The claim was later withdrawn, and the matter has gone to non-binding arbitration.

If a new approach leads to less acrimony during and after construction of important infrastructure projects, that's good for everyone. **

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ABOUT THE COVER

The City of Toronto's Ashbridges Bay Treatment plant outfall—part of the Don River and Central Waterfront and Connected Projects—is only one of this year's Top100 projects, which totalled \$273 billion. Learn more about this year's list on page 12.

ONTARIO ANNOUNCES PLANS FOR TWO NEW HIGHWAY PROJECTS



The Ontario government announced it is moving forward with building Highway 413, a new 400-series highway and transit corridor across Halton, Peel, and York regions and the Bradford Bypass, a new four-lane freeway connecting Highway 400 and Highway 404 in Simcoe County and York Region.

"With Halton, Peel, and York regions all set to grow at incredible speed, our government is saying yes to building the roads and highways that will keep these communities moving," said Premier Doug Ford.

In its fall economic statement, the provincial government earmarked \$2.6 billion for highways and bridges, including committing to advance Highway 413 and the Bradford Bypass, but hasn't provided an exact figure for spending on either project.

According to the province, both York and Simcoe are expected to experience rapid growth over the next 10 to 20 years and investing in this new corridor is required to ease congestion on Highway 400 and existing east-west local roads.

"Historic transportation infrastructure investments, like the Bradford Bypass, will move people faster, get goods to market quicker, and reduce greenhouse gas emissions resulting from bumper-to-bumper traffic," added Caroline Mulroney, Minister of Transportation. *

NEXT ISSUE: MARCH/APRIL THE INFRASTRUCTURE LANDSCAPE

Natural Infrastructure The benefits of going green. Community Benefits

How projects are collaborating with residents. **Outlook** What's ahead for infrastructure in Canada?

2022

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Front

NORTH SHORE PROJECT CONTRACT TERMINATED

etro Vancouver provided a letter to Acciona Wastewater Solutions LP with notice of default and its intent to terminate the contract for them to build the future North Shore Wastewater Treatment Plant.

"Acciona has underperformed and consistently failed to meet its contractual obligations which include delivering the project on time and within budget, as required under the initial fixed-cost design-build-finance model," said Jerry Dobrovolny, Commissioner and CAO of Metro Vancouver. "This project is already two and a half years behind schedule, and they've informed us that they require an additional two years. They've also asked for an increase in budget which would almost double the original contract price."

Metro Vancouver will now proceed with selecting a new contractor to deliver the project and has engaged a panel of expert advisors with extensive experience in major capital infrastructure projects to review the process of selecting a new contractor, overall project design, and revised budget and schedule.

"The action by Metro Vancouver to begin terminating the North Shore Wastewater Treatment Plant contract is regrettable, unnecessary, and certainly not in the long-term interests of Metro Vancouver residents or the environment," read a statement from Acciona Canada.

"[We have] performed approximately \$100 million in contracted work for which we have not received payment. Nonetheless, Acciona Canada continues working on the wastewater treatment project, contrary to recent statements by Metro Vancouver officials."

When complete, the North Shore Wastewater Treatment Plant will serve more than 250,000 residents of the Districts of West and North Vancouver, the City of North Vancouver, and the Squamish and Tsleil-Waututh Nations and provide tertiary treatment to better protect the environment. *

QUEBEC BRIDGES USE RECYCLED GLASS

A project to build two Montréal bridges incorporating recovered glass has been chosen from among candidates worldwide to receive the prestigious 2021 Excellence in Concrete Construction Award in the Infrastructure category from the American Concrete Institute.

The Darwin bridges are located on Boulevard de L'Île-des-Soeurs in Montréal's Verdun borough.

"These are the first bridges in the world to be built with concrete that incorporates finely ground recycled glass powder," said Sylvain Ouellet, head of infrastructure at the Ville de Montréal. "That this project could happen is due to the 17 years of research done by the Chaire SAQ at the Université de Sherbrooke in close collaboration with the Ville de Montréal."

"At the SAQ, we are very proud that a bit of us can be found in these bridges," added Marie-Hélène Lagacé, at the Société des alcools du Québec (SAQ). "In the coming months, the rollout of an expanded deposit-return system will give us access to high-quality glass and incorporating glass powder into infrastructures is an innovative way of using the material. This fits perfectly with our aim of encouraging the circular economy."

Montreal's Darwin bridges used an estimated 70,000 recycled glass bottles hat were crushed into fine power and mixed into the concrete.

Construction of the Darwin bridges has given a second life to the equivalent of some 70,000 wine bottles, resulting in a savings of 40,000 kilograms of cement. Because cement production is a source of greenhouse gas emissions, around 40 metric tons of CO_2 were kept out of the atmosphere by using this innovative construction method. \clubsuit



CIB INVESTS IN DISTRICT ENERGY PROJECTS

Canada Infrastructure Bank (CIB) and Enwave Energy Corporation have completed a long-term agreement valued at \$1.4 billion to accelerate and advance district energy projects in Toronto and Mississauga.

The CIB is committing \$600 million to the project which allows Enwave to accelerate and scale the build-out of its district energy systems.

"District energy projects align with our priority to invest in clean energy infrastructure which reduce greenhouse gas emissions," said Ehren Cory, CEO, Canada Infrastructure Bank.

The new investment represents a unique opportunity for Enwave to deploy sustainable technologies, such as wastewater heat recovery and Geoexchange, in delivering community-scale low-carbon energy for new networks in Toronto and Mississauga. Enwave will also expand and enhance the efficiency of its existing low carbon hot water district in Toronto, optimizing the base network.

"This investment from the CIB will be the catalyst for accelerating impactful low carbon energy projects," said Carlyle Coutinho, CEO, Enwave Energy Corporation. "In collaboration with the City of Toronto and City of Mississauga, Enwave is committed to deploying advanced and innovative low carbon energy solutions at scale enabling a leap forward in the energy transition." *



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Leadership

INNOVATIVE INFRASTRUCTURE STANDARDS

Contemplating robust resilience with Michael Leering of CSA Group. By Connie Vitello

D eveloped away from the political arena, standards offer government and industry an objective option for addressing some of today's most pressing issues. The diverse, consensus-based process offers governments a trusted resource that can serve regulatory needs and save valuable time.

CSA Group (formerly the Canadian Standards Association) is a leader in standards development and in testing, inspection, and certification around the world. CSA Group's standard development organization is an independent, not-for-profit membership association serving industry, government, consumers and other interested parties in Canada and the global marketplace. Through development of standards, CSA Group aims to enhance public safety, improve quality of life, and preserve the environment.

CSA Group's more than 3,000 standards and codes—many referenced in legislation and construction specifications—help safeguard human life and contribute to progressive improvements, including in the infrastructure industry. The CSA Group team works closely with industry stakeholders, government, academia and industry associations to develop standards in 54 technology areas.,

For over a century, the organization has led the way in the study of pressing topics. Today one of the organization's areas of focus is climate change and its impact on construction and infrastructure standards, important role standards and codes continue to play in helping to ensure the safety and sustainability of Canadians and the places that they live, work, and play.

What prompted you to enter the world of standards development and what are some of the accomplishments that have resulted in your rise to the senior ranks at CSA Group?

In order to optimize infrastructure investments, it's critically important that governments recognize new standards that have been developed by a diverse group of experts.

including those related to resiliency and energy efficiency.

ReNew Canada recently spoke with Michael Leering, director of environment and business excellence at CSA Group in Ottawa, to discuss standards impacting the infrastructure industry and helping communities to become more resilient. Leering shares his expert insight on the I am an environmental engineer by training at the University of Guelph, with a focus on greenhouse gas accounting. I came to CSA Group at a time that it was keen to help people apply the standards that we were writing and joined the Ottawa office which focused on climate change related work. Notably, CSA Group runs and operates greenhouse gas registries across Canada,





both voluntary and regulated. Most notably, we run and operate the Government of Alberta's (GOA) offset system where we manage over one million tonnes of compliance credits on behalf of GOA. I cut my teeth applying the international accounting standards for GHG, which our registries are based, helping to quantify, validate, and understand emissions management. We play an important role in ensuring transparency and accountability of GHG assertions, with our registries providing full public disclosure.

After that I was promoted to program manager of environment and climate change. Today I'm the director of environment and business excellence, overseeing three major programs: the aforementioned registries; environment and climate change, including sustainable finance and circular economy issues; and, the natural resource standardization portfolio, which includes our flood resilience work, forestry, mining carbon capture and storage to name a few. I'm happy with the breadth of work that the team is taking on.

Walk us through the key process involved in deducing how to address standards

impacting national infrastructure development and maintenance.

I work with an amazing team that is involved in developing and establishing many national standards. When we look at how we deduce and understand infrastructure standards, I want to highlight two major factors:

• Membership CSA Group and our standardization work relies on over 10,000 volunteer members from academia, government, and industry. We balance the representation in terms of diversity and geography.

2 Research CSA Group now has an arm that invests in research to better understand gaps in standards development. There's a plethora of research papers available on a variety of infrastructure topics on our website. For example, a recent report focusses on naturebased infrastructure solutions: *csagroup.org/ article/research/nature-based-solutionsfor-coastal-and-riverine-flood-and-erosionrisk-management*

Severe weather is affecting Canadians across the country, whether in the form of wildfires, flooding or unpredictable patterns, emphasizing the urgent need to adapt and make communities more resilient. Specifically, infrastructure systems for electricity, bridges, buildings, surface water, and wastewater treatment must be updated accordingly. Share your perspective on how to best achieve more resilient and sustainable infrastructure standards, and real improvements, in those essential areas.

At CSA Group, we're tackling the development of resilient and sustainable infrastructure standards from a few different angles. The first is the development of weather statement standards. As we understand that climate change is a growing problem it's important to understand the changing climate. We're establishing a series of standards on collecting weather data and how to effectively interpret the data, supported by the Standards Council of Canada.

The second area relates more to critical infrastructure systems like electricity and bridges. We're updating the codes affecting these systems, such as the Canadian Electrical Code. It needs to be updated with climate resilience in mind. We just completed national consultations which consolidated into 55 major recommendations to improve the electrical code. Simple things such as



moving electrical outlets to four metres off ground level from two metres. So, if there's a flood in your basement, you're going to be better off.

The third area is publishing new standards such as flood resilient design for existing communities as well as new communities, as well as standards for emerging issues such as erosion and sediment control and bioretention.

Northern Canada has heightened challenges due to climate change, including melting permafrost and increasingly vulnerable populations. In the Nov/Dec issue, Irving LeBlanc, director of infrastructure for the Assembly of First Nations, emphasized the need for clean drinking water, safe fourseason roads, and clean energy options. What standards are helping address the significant northern challenges in general and the Indigenous infrastructure challenges in particular?

That's a great question. Climate change and the effects of it in northern communities are a major focus of CSA Group across many of the sectors. We've developed a series of national standards explicitly for the north—over 10 national standards that are accessible and downloadable. Largely speaking, they are part of the Northern Infrastructure Standardization Initiative from the Standards Council of Canada. Two examples are: the planning, design, operation, and maintenance of wastewater treatment in northern communities using lagoon and wetland systems and technical guidance on infrastructure in permafrost regions and changing snow loads. For example, the recently released CSA S501:21, *Moderating the effects of* for economic recovery to support green infrastructure and sustainable transportation systems. What are your thoughts on how to optimize these investments?

In my view, in order to optimize infrastructure investments, it's critically important that governments recognize

We need to make sure standards are adopted and utilized, and to continue to raise awareness about the solutions that are available today to make communities more resilient.

permafrost degradation on existing building foundations, is focused on moderating the effects of permafrost degradation on existing building foundations.

We've also released six research papers on northern challenges specifically, including data on health services and assessing climate vulnerabilities of northern airports. For further information, visit *csagroup.org/ standards/standards-research* and search for "north."

Over the past year, the federal government has prioritized unprecedented investments

the new existing standards for improved resilience that consolidate expertise of a diverse group of experts. From a federal, provincial, and municipal level, there are standards and codes that should be utilized to guide optimal investing. The National Research Council of Canada and its Climate-Resilient Buildings and Core Public Infrastructure Initiative, funded by Infrastructure Canada, supports the development of green infrastructure. So, for example, two new national standards were developed under this initiative, on the design, and secondly construction, Leadership

of bioretention systems that can support community resilience. Bioretention systems are engineered to capture rainfall where it falls, so anything that aids the capture rate and prevents pressure on sewer systems is important to consider. We need to make sure standards are adopted and utilized, and to continue to raise awareness about these solutions that now exist to make communities more resilient.

We need to make sure standards are adopted and utilized, and to continue to raise awareness about these solutions that now exist to make communities more resilient.

Much has been made about the potential for Environmental, Social, and Governance (ESG) frameworks to make a difference in Canada and globally, but there are persisting uncertainties and ambiguities. What do you think is the best way forward to achieve a more harmonious, effective, and standardized ESG reporting system?

Standardizing the development and implementation of ESG frameworks is incredibly important. Recently we started work on an ESG guideline developed for associations across Canada so that they can better support and guide their members. ESG and sustainability practices should inform all standards which is why CSA Group has also undertaken an exercise to evaluate and map our standards against the United Nation's Sustainable Development Goals. We found that over 80 per cent of CSA homegrown standards linked to at least one sustainable development goal, which highlights the importance of the connection between the use of standards and best environment, social, and governance practices. We'll be sharing more about this initiative before the New Year.

What are your short-term and longterm goals for making a difference in the industry?

The short-term goal is to continue to raise awareness and increase the adoption and utilization of these important new standards across the country. The long-term goal is to continue to develop standards and solutions that will fill gaps in society and keep Canadians safe. There's really no shortage of matters for us to tackle. *



Connie Vitello is the contributing editor of ReNew Canada.



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INFRASTRUCTURE INCANADA

A look inside the 2022 Top100 Projects report. By John Tenpenny

D espite almost two years and counting of the COVID-19 pandemic, infrastructure megaproject development in the country has not slowed down.

In the case of Canada's Top100 Projects, the overall value continued to grow, with an increase of nearly \$20 billion to \$273 billion versus last year's \$253.8 billion. The list turned over 13 projects, 10 of which were due to substantial completion being reached, and 13 never-before-listed projects found their way into the 2022 report.

Of the five projects valued at \$1 billion or greater removed from the 2021 list, four were valued at more than \$2 billion despite 33 projects reaching that threshold in the 2021 report.

All five of those projects were due to reach substantial completion, with two others from the list of projects dropped because of changes made to the project scope. In the case of Vancouver's North Shore Wastewater Treatment Plant, issues between the project owner and the construction consortium have led to the project being put on hold. (See article on page 5.)

In the 2022 version of the report, six of the 13 new projects in the 2022 report carry a value, capital cost or P3 contract value, of over \$2 billion. The new projects were fairly evenly split within the key development sectors, with two projects each from the transit and other (communications/ water-wastewater) sectors and one project each from the transportation, and buildings (health care) sectors.

Here is a look at some of largest new infrastructure projects from across Canada making their debut on the 2022 Top100 Projects report.

British Columbia Iona Island Wastewater Treatment Plant

The existing Iona Island Wastewater Treatment Plant in Richmond provides primary treatment for communities in Vancouver, the UBC Endowment Lands and parts of Burnaby and Richmond. As the facility reaches the end of its service life, Metro Vancouver has decided to build a replacement, to be built in two phases and cost approximately \$10 billion. The new plant will provide tertiary-level treatment and meet the latest seismic standards, account for future sea level rise and incorporate cuttingedge technologies for resource and energy recovery, greenhouse gas reductions, odour reduction and energy efficiency. About \$750 million will be spent on early works (phase one) between 2021 and 2025, followed by the remaining funds for advanced and final works from 2026 and beyond.

George Massey Tunnel Replacement

A new eight-lane immersed-tube tunnel will replace the George Massey Tunnel on Highway 99, providing people a toll-free crossing that aligns with regional interests and improves transit, cycling and walking connections across the Fraser River.

The announcement for the tunnel replacement comes almost four years after NDP Premier John Horgan scrapped the previous B.C. Liberal government's 10-lane, \$3.5 billion toll bridge.

"A new crossing to replace the George Massey Tunnel will improve traffic flow and make travel by transit, walking and cycling more convenient and attractive, without costing commuters hundreds of dollars a year in unfair tolls," said Rob Fleming, Minister of Transportation and Infrastructure.

The new eight-lane tunnel will be in operation in 2030, with the cost estimated at \$4.15 billion. Two of the eight lanes will be dedicated for bus rapid transit, and there will be separated pathways for cyclists and pedestrians. In the interim, the



province has started work to reduce traffic congestion by launching projects to improve transit and cycling infrastructure along the Highway 99 corridor and replace the Steveston Interchange.

Ontario

Ontario Connects

The Government of Ontario has committed nearly \$4 billion to connect every region in Ontario to reliable, high-speed internet by the end of 2025. This is the largest single investment in highspeed internet, in any province, by any government in Canadian history. This investment will help ensure that every household and business, in every community, has access to the digital world. To connect the remaining underserved and unserved communities across the province, Infrastructure Ontario is leading a new, innovative procurement process that started in summer 2021.

Hamilton LRT

Hamilton City Council voted to sign a memorandum of understanding (MOU) with Metrolinx and the province in the fall to build a light rail transit line from McMaster University to Eastgate Square.

Earlier, the provincial and federal governments committed to paying the \$3.4-billion cost of construction of Hamilton's LRT line. Metrolinx CEO Phil Verster said utility-oriented "early works" could begin as soon as 2022.

This new transit system will offer service from McMaster University in the west, through downtown Hamilton to Eastgate at Centennial Park in Stoney Creek. In total, the project will run 14 kilometres, with 17 stops and have an average end-to-end commute time of 32 minutes.

Quebec

Port of Montreal Contrecoeur Terminal

The Port of Montreal is experiencing a historic growth of container traffic for the past seven years. To accommodate additional container capacity, a dedicated container terminal will be built as an expansion to the existing Contrecoeur site. By 2025, with the support of Canada Infrastructure Bank and private partners, the Port of Montreal intends to develop a new state-of-the-art container terminal to handle 1.15 million twenty-foot equivalent units (TEUs). After receiving a favorable decision statement to proceed with the project and launching, in Q4 2021, an RFQ (Request for Qualification), qualified bidders will be selected by the end of Q2 2022. *

John Tenpenny is the editor of ReNew Canada.

OFF THE LIST

Here is the list of projects no longer listed as part of the Top100 Projects report:

- Muskrat Falls Project
- Keeyask Hydroelectric Project
- Southwest Calgary Ring Road
- CHUM Hospital and Research Centre
- Edmonton Valley Line Stage 1
- TTC Bus Fleet Renewal
- Union Station
 Revitalization Project
- Union Station Infrastructure Renewal Project
- North Shore Wastewater
 Treatment Plant
- Highway 427 Expanison Project
- Metrolinx Light-Rail Vehicles
- London Bus Rapid Transit System
- Tłįchǫ All-Season Road

<image>

Toronto's Union Station Revitalization Project incorporates unique engineering.

By Andrew Snook

oronto's Union Station is a wellknown landmark to both commuters in the Greater Toronto Area, as well as Canadians across the country. Whether it was to hop aboard or depart a VIA Rail train, jump on the subway, or use the GO Transit system, there's a good chance you've walked through the majestic Great Hall of Union Station at one time or another.

A stunning example of 1920's Beaux-Arts railway station design and architecture, Union Station officially opened to the public in 1927. But like most heritage buildings, Union Station began to look weathered over time and needed significant restoration work and expansion to keep up with Toronto's everincreasing population.

When the City of Toronto took ownership of the iconic station in 2000, it quickly began reviewing options for the restoration of the building. In addition to restoring the landmark to its former glory, the city wanted to ensure the station was ready to service the tens of millions of commuters that currently rely on the station, as well as design it for the growing number of commuters in the future.

To tackle this massive undertaking the city created the Union Station Revitalization Project (USRP), which ended up being an 11-year, \$824-million initiative funded by the City of Toronto (\$465.3 million), the Government of Canada (\$139.5 million), the Government of Ontario (\$191.8 million) and VIA Rail (\$24.9 million). The project was completed this past July.

The end result was a wide array of new features and additional square footage for Union Station which included a gross floor area increase of 14 per cent from 822,000 square feet to 936,000 square feet; tripling the capacity of the GO Concourses through the completion of the York Concourse and the revitalization of the Bay Concourse; a revitalized VIA Rail Concourse and Panorama Lounge; Front Street, York Street and Bay Street glass moat covers; expanded PATH access; and two new bike parking stations.

The dig-down

If this work wasn't difficult enough to perform while ensuring all the trains moving through Union station ran uninterrupted, add in the creation of an entirely new floor running under the concourses filled with 160,000 square feet of retail space, including the Union Food Court and Fresh Market (coming in 2022).



The daunting task of designing many of the new and restorative aspects of this massive undertaking fell to NORR Limited Architects & Engineers, an employee-owned, fully integrated, Canadian-based A&E firm with a team of more than 700 architects, engineers, planners, and interior designers that work across 14 market sectors in Canada, the U.S., U.K. and UAE. projects. A few of his more high-profile projects include the construction of Toronto's SkyDome, renamed Rogers Centre (project manager, 1986 to 1990); the Terminal 2 Redevelopment project at Pearson International Airport (architect and project manager, 1989 to 1998); the Pierre Elliott Trudeau Judicial Building in Ottawa (principal in charge, 1991 to 2005); and the Calgary Courts Center (project leader, 2003 to 2007).

This is a heritage building and I think it was a challenge to know what we could and couldn't do in terms of the construction.

Silvio Baldassarra, chair of NORR, led the design and structural engineering for the Union Station Revitalization Project. Before joining the project, Baldassarra had worked on several incredibly challenging infrastructure "Coming up with the original concept was a challenge for us, trying to preserve the heritage quality of Toronto's Union Station. We looked at all of the options," he says.

One of the most challenging and unique

aspects of the project was the construction of the new retail floor underneath the concourses.

"The concept of doing the dig-down developed in the original study we did in 2007 for the City of Toronto. We felt that digging down below the station would make the project meet the goals they were looking at," Baldassarra says.

NORR's plans for building a new retail space under the concourses included digging down three metres under the existing concourses and cutting and expanding the 280 existing concrete columns holding up the floor above, where millions of commuters were hopping onto subway trains to get to their destinations. When NORR presented its plans for the dig-down, the City of Toronto brought in three peer reviews of major structural engineers. All three peer reviews concluded NORR's concept was sound engineering.



The dig-down concept made it possible to allow for the construction of a concourse similar to airports, which didn't exist before; separated the passengers from the construction taking place; and created a new commercial floor for food and concessions, as well as retail.



BEFORE

DURING CONSTRUCTION

"We actually cut the columns under the existing tracks and trains kept flowing above," Baldassarra says. "Nothing like this has been done in Canada before or since."

The dig-down concept made it possible to allow for the construction of a concourse similar to airports, which didn't exist before; separated the passengers from the construction taking place; and created a new commercial floor for food and concessions, as well as retail.

"We dug down three metres underneath Union Station and then we brought in four steel columns and dug them into the ground around each existing column," Baldassarra explains.

The four steel columns braced the concrete slab above, allowing the construction teams to take the load off the original concrete column.

"They were able to cut the column, because the four steel columns around that column were taking the full load," Baldassarra says. "Then after we cut the column, we got rid

of the original footing. Then, we dug down three metres underneath that column, and poured a new foundation for the extension of the column. We put in the rebar for the round column and poured the new column underneath the old column 16 or 17 feet under the old column to support the original. In the meantime, the original column was just dangling there."

caused by the trains above. Baldassarra says that the largest amounts of force that caused reason for concern wasn't the sheer weight of the slabs or the trains.

"The weight on the column wasn't the highest load, it was the lateral breaking force of the trains above," Baldassarra says. "Because the tracks are very close, you could have three trains breaking all at once over the

We not only rejuvenated the entire building, but we've completely contained and restored the grandeur of the 1920s Union Station.

After the new footings were down more than three metres, the four steel columns and bracing were removed. While all this work was going on, sensors were placed throughout each column that were monitored 24/7 for any potential shifts or movements

column, and that force was huge compared to the dead load of the train being on top."

There was concern because the original concrete was poured in 1920. The structural engineers didn't want more than a 1/4-inch movement vertically.

"The structural engineers took turns monitoring it. The information was sent to their cell phones. If the alarms went off, they would head down to the site, because the work was 24/7. But none of the alarms went off on the 280 columns that were cut," Baldassarra says.

At the middle section of where the new columns were placed, there is rebar that extends out. This is where the new slab was built that became the new concourse floor.

The new retail floor below the concourse is being managed by Osmington (Union Station) Inc., a subsidiary of Osmington Inc. that entered into an agreement with the City of Toronto to become the retail developer at Union Station in 2009. The design for the retail floor was inspired by the design at Grand Central Station in New York City.

"The city will profit from this, once the space is fully leased out," Baldassarra says, adding that Metrolinx also purchased the area of the station it operates within, which is another benefit to the city. "Once we get through this pandemic, and the commercial, retail and food reopens below, Osmington is really going to turn this into a destination for commuters going through the building being able to use it as a destination."

Communication was key

City of Toronto's Frank Molinari, project director for major initiatives and strategic projects, says that the biggest challenge related to the project was keeping Union Station fully operational throughout the construction.

"Despite the complexity, the station never stopped operating. Train service continued on schedule. The city was going to make sure we weren't going to disrupt the service," he says. "We were in constant communication with the stakeholders—Metrolinx, VIA, Osmington—and the general public and the commuters."

To keep all parties up to date on the status of Union Station and the revitalization project, a host of tools were utilized.

"We had websites, radio announcements, all kinds of things where people could find out what's going on at Union Station," Molinari says. "I think the focus on communication helped alleviate some of the things that could make it difficult to work down there."

Maintaining heritage

Maintaining and revitalizing the original

design and structure of Union Station's Great Hall was a main priority, while ensuring the infrastructure was upgraded with everything needed to properly service the current 65 million commuters using the station annually, as well as be equipped to handle the 130 million commuters projected to use the station annually in 2030.

"This is a heritage building and I think it was a challenge to know what we could and couldn't do in terms of the construction what we could demolish and what we had to keep and refurbish," Molinari says. "The way we overcame that is we had a heritage consultant on board we worked with on a regular basis to work with Heritage Canada."

"We not only rejuvenated the entire building, but we've completely contained and restored the grandeur of the 1920s Union Station. The Great Hall has been completed restored," Baldassarra adds.

That said, not all original designs and uses for the station made sense to remain entirely in their original forms. One prime example of underutilized space that got much-needed work performed was the moat.

"The moat used to be the carriageway for horse and buggy for Union Station,"

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Baldassarra says. "At one point it was used as a parking area for rental cars, which was not a good use of space. It's now been covered over and is going to be a very vibrant passenger walkway with cafes once it's reopened. The re-use of the moat is something people are going to be really impressed with. It will be filled with tables and food service throughout, and it's totally covered in highend glass design." Essentially, when you get off the train you can go as far as Dundas Street and Bay Street and not have to go outside now," Molinari says.

Learning experience

Despite the many challenging projects that Baldassarra has worked on over his career, he says he can benefit from his experience throughout the 11-year construction and revitalization of Union Station.

If this work wasn't difficult enough to perform while ensuring all the trains moving through Union station ran uninterrupted, add in the creation of an entirely new floor.

The new walkway features glass moat covers over Front Street, York Street and Bay Street.

"That's a beautiful aspect of the station itself. It has glass that has been covered on the north, east and west. It protects the commuters from the weather. "For me, it's about the continuation of staging and phasing buildings that needed to remain operational during construction. I think that's something you have to do repeatedly to really try and understand how to do. Not everyone can do that. It truly is a design process," he says. Where does this project rank in Baldassarra's impressive career? Very high.

"This one is a special one. To reinvent buildings like this is a one-time thing. Doing a brand-new building is easy compared to doing a building like this," he says. "Frank and his group have been really great to work with, and all of the people before him. It's been a very difficult project for the team at the city to manage their way through, but they've navigated their way through it."

As for Molinari, he really enjoyed watching everything come together.

"I'm a construction guy. I like being on site and going through the progress. I really liked the renovations as well, so getting to see how the work progressed and the coordination of all this, that was absolutely amazing." *



Andrew Snook is a freelance business-tobusiness writer based in Mississauga, Ontario.



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Highway 413 to create 8,000 jobs annually, generate \$2.3 billion in earnings for Ontario workers, new RCCAO study finds

The GTA West Corridor would create thousands of jobs, provide substantial economic benefits, and generate significant tax revenues for governments according to a new jobs and economic impact report released by RCCAO.

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growth occurring in York, Peel, and Halton regions. The construction of Highway 413 will create a transportation corridor for additional future transit development to serve a growing region where more than 80% of people commute by vehicle.

This infrastructure project, like all others in Ontario, will be held to stringent environmental assessment processes and regulatory requirements that put environmental sustainability and wildlife protection at the core of construction design and its build. The construction industry is well versed in best practices and environmental remediation to mitigate any potential adverse impacts to the environment or species at risk.

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CONNECTING THE CORRIDOR

New Highway 427 extension moves transportation plan forward. By Grant Cameron

F our years ago, a small army of heavy equipment operators on backhoes and bulldozers began removing trees, shrubs, logs, fallen timber and other surface litter from along the corridor of the future Highway 427 Extension between Finch Avenue in Toronto and Major Mackenzie Drive in Vaughan.

It was tedious work and took several months for crews to fully clear the land. But by the end of 2018, work had started on installing culverts and crossings and building bridges along the 10.6-kilometre route.

Today, the \$616-million road widening and expansion thoroughfare is fully open for business. The announcement was made this past fall by Ontario Transportation Minister Caroline Mulroney who noted that the road will help improve traffic flow, reduce congestion, and move people and goods safely.

"As part of our vision for the Greater Golden Horseshoe, our government is investing in highway infrastructure to address congestion and keep up with the growing needs of Ontarians," she proclaimed. It hasn't all been smooth sailing, though. There have been a few hurdles along the way, namely COVID-19. Construction on the project proceeded during the pandemic, but under measures and protocols set by the province. At the end of the project, meanwhile, a dispute arose over the finished product that delayed the opening of the highway by several months. A lawsuit was filed by the contractor, LINK 427, against Infrastructure Ontario and the Ministry of Transportation (MTO) that remains unresolved.

The highway, a heavily used north-south commuter route from Toronto to the City of Vaughan and neighbouring communities, is reportedly saving motorists nearly an extra half hour of travel time per round trip during peak periods compared to driving along parallel municipal roadways, according to the province.

"The Highway 427 expansion will greatly benefit the people of Vaughan-Woodbridge," Vaughan-Woodbridge MPP Michael Tibollo said in a statement. "Not only will it help take vehicles causing crippling gridlock off our local roads, but it will also make our community safer while reducing travel times for commuters and commercial vehicles. Most of all, it means the creation of new opportunities like we have never seen before."

Bridges are integral

There are two main sections to the project.

An existing road was widened from Finch Avenue to Highway 7. The thoroughfare was widened from six to eight lanes between Finch Avenue to Steeles Avenue, and from four to eight lanes from Steeles to Highway 7. An upgrade was also completed to the interchange at Highway 7.

A new 6.6-kilometre extension was added from Highway 7 to Major Mackenzie Drive, with eight lanes from Highway 7 to Rutherford Road and six lanes from Rutherford to Major Mackenzie. Three new interchanges were built at Langstaff Road, Rutherford Road and Major Mackenzie Drive.

There were many companies involved in building the highway extension. LINK427 is a partnership of ACS Infrastructure Canada Inc., Brennan Infrastructures Inc., Dragados Canada Inc. and Bot Infrastructure Inc. Design of the highway was done by MMM Group Ltd. and Thurber Engineering. Approximately 1,000 jobs were created and sustained through 2018-2021 as a result of the highway expansion. On any given day, there were about 250 to 300 trades working on the project, most from the Greater Toronto Area.

Work took place concurrently at different locations along the section between Finch Avenue and Highway 7. The consortium took a more linear approach to the build on the expansion section of the highway.

The bridge work was complex. Installation of concrete girders on many of the structures along the route began in 2019. Piles and footing had to be installed, followed by abutments and piers, concrete decks, and asphalt roadway. The girders used over Rainbow Creek are more than 45 metres long and some of the longest ever constructed in Ontario.

Decks on the bridges are made of poured concrete that connects the top of the bridge structure to the girders and the rest of the bridge.

The structures most commonly used along the expansion are integral bridges, which means the deck of the bridge is contiguous with the approach slab. This method is deemed to be better for long-term maintenance of the bridge, especially during winters, as the slab provides a transition between the road and bridge abutment.



The consortium chose to move instead of demolishing the bridge because it meant the roadway was not out of service for long, it was a novel way to reuse the existing infrastructure and therefore reduce waste.

Crews began work on a Friday night. The process involved disconnecting the top of the bridge from the walls and footings. The SPMT was then used to move the structure and set

[The new Highway 427 extension] will help improve traffic flow, reduce congestion, and move people and goods safely.

Interestingly, in June 2019, one of the existing bridges along the route at Albion Road was moved six metres to the west over a single weekend. A Self-Propelled Modular Transporter (SPMT) machine was used for the move. The consortium had planned to demolish part of the bridge and build a new portion on the other side, as the location conflicted with the overall Highway 427 widening work. However, LINK 427 took a different approach. Since the existing bridge was in good condition, contractors decided moving it was the best approach.

"Moving the bridge was necessary so that the new eight-lane highway could be built," Jim Faught, a spokesman for LINK427, explained this past summer. "LINK427 decided to use a value-engineering approach instead. Since the existing bridge was in good condition, LINK427 determined this approach would be the most effective method to move the structure." it down in its new position. The project was built using a public-private partnership, or P3 model. All projects valued at more than \$100 million must go through an assessment to determine whether to use the P3 or traditional procurement. The assessment looks at project characteristics and objectives and chooses a delivery model based on such criteria as protection of the public interest, value for money, and appropriate public control.

Legal limbo

Despite the precautions taken, there have been legal troubles. Opening of the highway was delayed when LINK427 filed a statement of claim, alleging that the government changed the rules during the project and was abusing its power to force the consortium to do costly last-minute upgrades without compensation.

According to the claim, the province withheld a substantial completion payment

of \$144.8 million because the road was not built to specifications in the contract. There were concerns about gradients on the highway which allow water to drain off to the sides. Claims made in the lawsuit have not yet been tested in court.

Neither side is commenting on the dispute. However, Infrastructure Ontario confirmed earlier that LINK427 withdrew its claim and has agreed to deal with the matter by nonbinding arbitration rather than in court.

A request for comment sent to Minister Mulroney's office was not acknowledged and Lee Alderson, senior issues advisor at the MTO, replied to questions with an emailed statement that said, "The Ministry of Transportation has no comment beyond what can be found in the Ontario news release for the opening of the 427 Highway Extension earlier this fall."

Infrastructure Ontario also responded to a request for an interview with an email from communications advisor Mary-Lynn Smith that stated they decided not to go ahead with an interview at this point in time.

Meantime, Jorge Gomez-Perez, CEO of LINK427, responded to a request for an interview with an email indicating he decided not to go ahead with an interview at this stage, but would be happy to revisit the matter in late spring or summer 2022. *



Grant Cameron is an awardwinning journalist and communications professional based in Burlington, Ontario.



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TOGETHER WE BUILD SUCCESS



As electric vehicle use increases, charging infrastructure will need to keep up.

By John Tenpenny

he introduction of new, more affordable, electric vehicle (EV) models has many Canadians seriously considering making the leap to electric. The vehicles are ready, but what about the charging infrastructure and electric grid?

Transportation accounts for a quarter of Canada's greenhouse gas emissions (GHG), of which almost half comes from passenger cars and light trucks. The sooner we can make the jump to electric, the better positioned we will be in achieving our net zero goals. But at the same time, electric cars made up just under four per cent of all vehicle sales last year, according to Statistics Canada—even as Canada set a mandatory target for all new cars and light-duty trucks sold in the country to be zero emissions by 2035.

During a recent INFRAIntelligence webinar, ReNew Canada discussed with a panel of experts some of the obstacles and opportunities facing EV infrastructure. What's the timeline? And is it time to buy that EV you've had your eye on?

Where are we headed?

The good news is that EVs are increasing in

popularity. According to the latest report from Statistics Canada, registrations of battery electric and plug-in hybrid vehicles surged 89 per cent in the second quarter of 2021.

Across Canada, 16,167 new battery electric vehicles were, double the number from Q2 2020 and representing 3.3 per cent in total registrations. When plug-in hybrid electric vehicles are added—StatsCan includes hybrid electrics in its definition of zero-emission vehicles (ZEVs)—it brings the total number of new registrations to 24,006 zero-emission vehicles. This represents 4.9 per cent of total registrations.

During the recent federal election, the Liberals campaigned on a platform that included spending an additional \$700 million to create 50,000 new electric- and hydrogencharging stations. If the government makes good on that promise, it will give Canada's infrastructure a big boost.

But according to David Adams, president of Global Automakers of Canada we have a long way to go.

"We would probably need to look at something in the neighborhood of around

\$10.5 billion for our infrastructure over to get to 100 per cent ZEVs by 2035," he says. "So, while the amounts that feds have announced sounds impressive, it's still probably not enough to get us where we want to go."

Planning a rational deployment of that type of infrastructure is going to be very difficult, adds Stephen Beatty, vice president with Toyota Canada.

"It's like water in a bathtub. The EV supply is sloshing back and forth across the country, whether that's for plug-in for battery electric, or whether it's for hydrogen production for fuel cell vehicles."

Where EV infrastructure will or should be located is another issue, says Cara Clairman, president and CEO of Plug'n Drive, a non-profit organization committed to accelerating the adoption of electric vehicles.

"About 80 per cent of EV owners plug in at home at night, but it gets much more challenging the more rural you go. For people commuting in urban areas, it's relatively easy, but for folks who are trying to make a more remote trip, it's still pretty tough."



The biggest requirement is that a very comprehensive strategy around how this charging infrastructure is going to be built out is needed, says Ryan Robinson, research leader, with Deloitte's automotive sector.

"If it's just who can write the best proposal to gain access to a pot of money, that's not going to get us to where we need to go, because what we're going to end up with this monster that doesn't have any organization to it, and we run the risk of putting chargers in place where they're not needed, or not having the nuanced conversation around the technology right now is really in its nascent phase, and we're expecting tremendous amounts of gains on the technology itself. And how that's going to have an impact on the infrastructure we need to be able to charge those batteries, is another conversation that needs to happen right now."

Building out

But in even in large cities like Toronto, publicly accessible plug-in options are needed, says Adams, who like many only has street parking available.

The good news is that EVs are increasing in popularity. Registrations of battery electric and plug-in hybrid vehicles surged 89% in the second quarter of 2021.

fact that from an affordability standpoint, people also need financial assistance with the charger itself."

Battery technology itself will also be an issue, says Robinson. "Because there's a real risk that we could end up with a ton of money being spent on chargers that just aren't going to be relevant. We know that battery "I don't have access to my garage, or any other charging station close to me, so I'm completely reliant on the public infrastructure."

He says a lot of work that needs to be done in that existing physical infrastructure space, whether that's through amending local bylaws and building regulations, such as the

ELECTRIC IDEA

We asked recent INFRAIntelligence webinar attendees some questions about electric vehicles.

Here's what they had to say:

Do you have an electric vehicle?

Yes 19% No 79% Hybrid 2%

What is preventing you from buying an electric vehicle? Higher purchase price compared to gasoline 51% Lack of public charging infrastructure 22% I've already got an EV 4% City of Vancouver is doing.

"I think B.C. and in particularly the city of Vancouver have done a better job at trying to at least create the environment to facilitate the adoption zero-emission vehicles."

Unfortunately, the building codes across Canada are quite inconsistent, adds Clairman.

"There should be something more consistent across the country to model what Vancouver does," she says. "Which just requires rough-ins for EV charging when a building is being constructed. And of course, it's so much cheaper to rough it in when you're building, rather than to try to retrofit. So, let's do it when it's cheapest—when you're designing and."

For Robinson, we might be getting a little ahead of ourselves, as the demand for EVs, while on the rise, is still far behind internal combustion engines.

According to recent research from Deloitte, only about 16 per cent of consumers in Ontario say they're ready to make the leap into full battery electrics.

"And to go from 16 to essentially 100 per cent over the next decade, means we still have a very long way to go on this journey, in a very, very short period of time." What's holding them back is affordability, says Robinson.

"You've got 76 per cent of consumers that are intending to buy an electrified vehicle that want to spend or are expecting to spend less than \$50,000.

"It's a psychological barrier for people."

Economic development

Some jurisdictions are treating EVs as economic development, according to

According to a recent report produced by the program, a strategic approach is needed by the area, which is one that relies on transportation and tourism by "passenger vehicle.

"EV drivers are affluent, travel often and prefer to travel to places where they know they will be able to access a reliable network of public charging stations," read the report. "Unfortunately, more than 80 per cent of EV drivers currently believe that accessing

EV batteries have two other potentially useful applications: mobile storage while they are installed in the vehicle, and second-life storage after the vehicle batteries are retired.

Clairman, who points to a program in Ontario's Bruce, Grey and Huron counties. She says the Nuclear Innovation Institute's Clean Energy Frontier program is ahead of the curve and aims to bring in more tourists to the region, while enhancing their EV infrastructure. charging in Bruce, Grey and Huron will either be difficult or very difficult."

The report recommends the region "develop a clear and coordinated strategy for installing EV charging capacity across the region and that individual municipalities transportation planning should include

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commitments to public charging infrastructure enhancements, including leveraging the federal government's Zero Emission Vehicle Infrastructure Program, and collaborate where possible to reduce installation costs."

Beatty is experiencing a similar experiment in Bancroft, Ontario, where he has a residence and where chargers were recently installed, including a Telsa Supercharger.

"And one of the things that's happened as a result of that is we've brought EV drivers into the community, and it's a community that relies very heavily on tourism," he says. "I'm not sure that this was ever the intent, but what it's done is it's brought new types of tourist traffic into the area because they have the infrastructure in place to support it."

It's doing a couple of things, according to Beatty. One is, Tesla owners tend not to be entry level vehicle buyers, so they bring with them higher disposable income. The second part is getting that concentration of people operating with electrified vehicles in more rural communities, demonstrates that it's possible.

Battery life

In the larger picture of getting to net zero, EVs, particularly the batteries themselves, have another role to play, says Clairman. Through mobile storage and second life uses, EV batteries could create value for EV owners, workplace buildings, and the electricity system.

"EVs are not just cars, they are batteries that can store energy for the electricity system," she says.

Plug'n Drive produced a report that examined the potential for using EV batteries as electricity storage options to contribute to Ontario's electricity system and assesses the value that EV owners may realize by supporting such use. Besides driving the car, EV batteries have two other potentially useful applications: mobile storage while they are installed in the vehicle, and second-life storage after the vehicle batteries are retired.

The report found that the best way to capture the value of mobile storage from a large number of commuter vehicles is at workplaces categorized as Class B electricity consumers. EV batteries could deliver value to several stakeholders through these uses, including EV owners, workplace buildings, and the electricity system.

Altogether, there is a potential for \$38,000 in benefits per EV over its life, contributing to up to \$129 million/ year of benefits to the electricity system by 2035.

The race is on

While the year 2035 seems to loom over the push to increase the use of zero-emission vehicles, putting an exact timeline when we'll see widespread sustainable electric vehicle infrastructure in place is elusive.

"I think it's a race," says Beatty. "As long as people see economic opportunity out of it, then this is beneficial. To the extent that people feel they're being forced into it, then that reluctance is going to hold people back from making those decisions about investment infrastructure.

"But it's going to happen. It has to happen. It will happen. It's just a question of 10 years or 15 years, what's the window for it?" *

John Tenpenny is the editor of ReNew Canada.

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Centennial College's A Block Expansion Project achieves zero carbon certification.

By John Tenpenny

he Centennial College A Block Expansion Project is looking to be one of the first mass timber, net-zero carbon post secondary education facilities, and was recently certified Zero Carbon under the Canada Green Building Council's Zero Carbon Building Standard v1.

"We wanted to raise the bar for future postsecondary projects," said Craig Stephenson, Centennial College's president and CEO. "At Centennial we view sustainability, inclusivity and Indigeneity as wholly interconnected ideas and we wanted a building that demonstrates that crucial relationship."

The \$105-million addition on the Progress Campus of Ontario's first public college will provide 150,000 square feet of space for academic rooms and common areas to house the College's School of Engineering Technology and Applied Science programmes (ICET). Over 133,000 square of that space is new construction, and the other 16,000 is renovation of the existing facility. The adjacent structure will also be renovated and link to two levels of the new building. The building includes classrooms, labs, spaces for student engagement, administration and faculty offices.

Using engineered wood products to create building structures instead of steel or concrete, in line with the sustainable vision of the college, the project is set to become the first post-secondary mass timber facility completed in Toronto.

The A Block Expansion project began with interior A Block renovation work commencing in June 2020, as well as early works site preparation, such as rerouting underground utility lines and vegetation and bridge removal over the late spring and summer. Full site mobilization and construction started last fall. Substantial completion is anticipated by fall 2022, and building occupancy is scheduled for January 2023.

Design-build collaboration

As the design-builder of this contemporary six-storey building, EllisDon pulled together

a world-class team, including DIALOG and Smoke Architecture, to design and construct the facility as an example of excellence in architecture, sustainability, community building and higher education.

Substantial completion of the Centennial College A Block Expansion Project is anticipated by fall 2022, and building occupancy is scheduled for January 2023.

"EllisDon's mass timber specialists eagerly anticipate working closely with Centennial College and our design partners to create this precedent-setting project," said Geoff Smith, EllisDon's CEO. "Centennial College's A Block [expansion] project delivers us all the wonderful opportunity to construct sustainable structures that are not only beautifully functional, but more importantly help immediately address the critical challenges posed by climate change."

Translating the owner's sustainability aspirations and requirements into a realistic and viable design required true collaboration throughout the entire project life cycle, according to EllisDon.

"Working in concert with the owner, engineers and architects has been fundamental to ensuring sustainability goals



are accomplished throughout the design," stated the company. "EllisDon's extensive experience with manufacturers and suppliers will continue to complement these efforts throughout the construction process and will ensure that the first-class sustainability targets are achieved for the project."

The low carbon, highly energy efficient, mass timber building will be constructed with a combination of cross and glue-laminated Davenport, director, Construction Sciences, with EllisDon. "It's all black spruce from the boreal forests of northern Quebec."

The volume of timber being used is roughly 3,600 square metres.

"This project will be a clear demonstration of how higher-education facilities can make an important contribution to reducing environmental harm by eliminating CO2 emissions," said Craig Applegath, project

At Centennial we view sustainability, inclusivity and Indigeneity as wholly interconnected ideas and we wanted a building that demonstrates that crucial relationship.

locally sourced Canadian timber. The mass timber structure will be manufactured locally—with materials sourced via Nordic Structures in Montreal—through sustainably harvested and FSC-certified wood.

"After working with our partners to make sure the aesthetic vision was achieved, then it was about where to source the timber from and we felt it was important that it was local, so we partnered with Noridic," said Vincent principal, DIALOG. "Its zero-carbon emissions design, and its ability to store thousands of tonnes of carbon in its sustainably harvested mass timber wood structure, will be an important precedent in both Canada and around the world."

EllisDon's internal Sustainable Building Solutions team is managing the sustainability targets, which included certification under WELL V2 and LEED V4. RDH Building Sciences Inc. was brought in to help manage the net zero carbon features and has been instrumental in the project achieving Zero Carbon certification.

According to Navisa Jain, project manager, Sustainable Building Solutions, with EllisDon, the LEED and net zero carbon features of the project focused on a highperformance building enclosure to reduce heating and cooling loads on the building, efficient mechanical system design in order to provide exceptional occupant comfort as well as renewable energy integration (i.e. 5 per cent onsite renewable energy generation) to supplement building energy use with clean power.

"The college was pretty clear on their vision for the building and that sustainability was the top priority," said Jain. "As part of the design-build team, what we did was we looked for synergies across all three rating systems and chose those particular credits to pursue on the project."

EllisDon also conducted a life cycle assessment to evaluate the embodied carbon footprint of the project. The intent of this analysis was to estimate the embodied carbon, identify impact reduction measures,



quantify potential savings, and benchmark against the CaGBC Zero Carbon certification requirements. This assessment, conducted only on the design's primary material assemblies (foundation, structure, and enclosure), contributed to the project's overarching low carbon sustainability goals and toward the Zero Carbon certification and reduced the total amount of carbon offsets to be purchased. of Canada," stated the College when it unveiled the design. "The building design inside and out will reflect Indigenous values and principles and is based on the concept of 'two-eyed seeing'—viewing the world through the lens of Indigenous knowledge and the lens of Western knowledge."

The building form is inspired by Indigenous principles and the Mi'kmaq concept of two-eyed seeing (seeing through

[This] project delivers us all the wonderful opportunity to construct sustainable structures that are not only beautifully functional, but more importantly help immediately address the critical challenges posed by climate change.

Indigenous inspired

The building will also draw heavily from Indigenous principles and references nature and designs from Indigenous peoples, which is instrumental to the project, and was a stated goal of Centennial College from the outset.

"This building is a significant first step towards realizing the goals outlined in the College's Indigenous Framework and advancing our commitment to Truth and Reconciliation with the Indigenous peoples both an Indigenous lens and Western lens). The main entry is at the east, the traditional location for the entrance in Indigenous structures. A grand stair ascends from the East entrance towards the west, lined with Indigenous stories and forming part of Wisdom Hall, a highly transparent, fourstorey diagonal atrium space for faculty, staff, students and visitor engagement and study zones. Connected to the atrium at Level 2 is the Indigenous Commons, a large multi-purpose space that serves to organize the building program around it and forms the heart of the building.

The new building connects to the existing street edge and includes a large, landscaped area filled with Indigenous plantings. It also seamlessly connects to the existing A-Block Building and transforms the south-west corner of the campus, forming a gateway and yielding greater pedestrian connections that enhance the public realm.

According to Eladia Smoke, principal of Smoke Architecture, the design was inspired by regional Anishinaabe architecture. Students will enter the building from the east into an active multi-story space of convergence. Revolving around an Indigenous Commons that opens up into a central courtyard with native plantings, the project reinterprets Indigenous concepts of community, biophilia, and sustainability.

"This project grows beyond the simplistic application of Indigenous elements onto a mainstream design," said Smoke. "This design is rooted in Indigenous principles, evoked in a contemporary setting. The building's narrative is a story of seed, growth, culmination, and balance, revealing the seven directions teachings in a cyclical view of an interconnected world. *

John Tenpenny is the editor of ReNew Canada.





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A GUIDE FOR ARCHITECTS AND EN

according to a RCCAO study

Millions of cubic metres of treated drinking water are being pumped into the ground every year across Ontario municipalities as the result of leaky and broken pipes,

ONE SIZE DOES NOT FIT ALL

Many factors come into play around decisions on linear water infrastructure renewal. *By John Tenpenny*

or ReNew Canada's recent Linear Water Infrastructure survey, engineers, and consultants from across the country weighed in to provide expert perspective on renewal options—mainly rehabilitation and replacement—that can be implemented, independently, or jointly.

Our research in part one indicated that a variety of factors traditionally impact decisions around linear water infrastructure renewal, including:

- Project objectives (age and size of the renewal project and nearby developments);
- Site constraints (such as a sensitive surface structure or geographic challenges);
- Schedule timeframes (emergency service versus planned project); and
- Client budgets.

During a recent INFRAIntelligence webinar, with support from ALTRA Proven Solutions, ReNew Canada discussed with a panel of experts the priorities involved in the decision-making process and other pressing water infrastructure issues. When it comes to linear water infrastructure, how do municipalities and water infrastructure owners decide how to rebuild or renew their pipelines? What are their key priorities and concerns?

Leaky pipes

According to a report a commissioned by the Residential and Civil Construction Alliance of Ontario (RCCAO), millions of cubic metres of treated drinking water are being pumped into the ground every year across Ontario municipalities as the result of leaky and broken pipes.

The study indicates that many Ontario municipalities report an estimated leakage rate of at least 10 per cent. However, it also notes that reports by consultants who conducted actual assessments show that rates in Ontario could be as high as nearly 40 per cent.

"These findings are quite alarming and really reflect the fact that our water infrastructure across Ontario is aging and in dire need of repair," says RCCAO's executive director Nadia Todorova. "I think the overall message from the report is that it pays to fix the systems. If we don't look at after our linear infrastructure and infrastructure in general, it really will lead to a myriad of issues starting from public health concerns." A bright spot in the report, says Todorova, is that there has been significant improvement in asset management practices across Ontario municipalities. "So, in terms of what the government can really be focusing on, is staying the course and continuing to provide funds for asset management projects."

Shaun McKaigue, president of FER-PAL Infrastructure agrees that asset management is making a big difference.

"Municipalities are different sizes and they're at different levels of sophistication. But the fact that asset management is being used at all—not always listened to perhaps, but always used—I think, is a big step forward.

The type of leaks facing municipalities have a direct impact on what strategy rehabilitation or replacement—will be used, according to Devan Thomas, global conveyance market leader for AECOM.

"Water main leakages are doubly bad," he says, "because not only do you have to treat and convey, it's also robbing capacity that would be for other normal uses."

There are a lot of tools now to inform leakage and what agencies can be doing to find that right balance of leakage management programs, says Thomas.



"Chances are that if you've got old pit cast iron pipe in the ground, you're dealing with a lot of leakage. But there's a lot of good structural integrity there, too.

"Just because you have high leakage doesn't necessarily mean you need a full water main replacement program. You can start to tackle some of these things and take advantage of the remaining structural health the pipe."

Bill Shea, director of distribution and collection for Toronto Water, which is

250,000 people or filling more than 15,000 Olympic-sized swimming pools every year.

"Everybody probably knows that old cast iron water mains are extremely thick, but if they suffer from corrosion, they tend to fall apart all at once. And the fact is, once you start digging to fix one, they start popping all over the place. So, if you leave them alone, you might be okay. But the reality is we can't leave them alone.

"We have a comprehensive program of

When it comes to linear water infrastructure, how do municipalities and water infrastructure owners decide how to rebuild or renew their pipelines?

responsible for all aspects of the city's water supply and treatment, knows a thing or two about old, leaky pipes.

The RCCAO study also noted that in Toronto, 11 per cent of the more than 6,000 kilometres of water mains are more than 100 years old. The city has consistently reported a leakage rate of 10-15 per cent, which means it wastes 103 million litres per day. The volume of losses is equivalent to supplying the daily demand of a system servicing a population of about rehabilitating those water mains and Toronto Water spends over a billion dollars a year in capital replacement—over the last five years over \$300 million dollars on just realigning."

Paying their fair share

When it comes to paying for water infrastructure repairs, the comparatively low rates Canadians pay for their water is always a hot topic. How can municipalities convince citizens to pay more for their water?

HIGH WATER

We asked recent INFRAIntelligence webinar attendees some questions about water infrastructure renewal. Here's what they had to say:

What is your top priority when selecting technology for a replacement or rehabilitation project? Reduced disruption in the community 15% Environmental impacts 20% Cost to the client 65%

Which do you believe is the greatest obstacle to ageing water infrastructure renewal? Cost 100% Community disruption 0% Environmental Impacts 0%



"People don't value what they don't pay for," says McKaigue. "Water is incredibly cheap in Canada. And so traditionally, for many municipalities over the years it was almost cheaper to produce the water even though they've lost it."

And it's only now, he says, with the advent of asset management that governments are beginning to recognize that the real cost isn't matched by what people are paying for water now, and what they could easily pay for.

"Compare that to people's cell phone bill, and you might find a little more political motivation," says McKaigue.

Rates have been increased in most jurisdictions, adds Thomas, but that may still not be enough, although water ratepayers are becoming more sophisticated when it comes to understanding investments in infrastructure and the corresponding maintenance of service levels.

Make it a combo

According to ReNew's survey, when working with municipal clients on linear water infrastructure renewal projects, respondents most often recommend a roughly even split between full open-cut replacement and trenchless excavation solutions. Nearly a third of respondents (31.73 per cent) indicated a preference for a combination of methods. These decisions are made based on assessment data. A clear majority (93 per cent) of respondents indicated that their municipal customers use leak detection or condition assessment technology before proceeding with a project.

"The right mix is what agencies are doing is usually driven by the condition of the existing infrastructure and what it needs," says Thomas.

It is also capacity related he adds. If the

According to a report, millions of cubic metres of treated drinking water are being pumped into the ground every year across Ontario as the result of leaky and broken pipes.

"When I work with owners being able to articulate the wise use of available funding is a big focus for them, so are they putting [funds] in the right bucket, the right operations and maintenance program or the right capital improvement program," says Thomas.

"And asset management programs or plans, which are now mandated in a lot of jurisdictions as a requirement for getting funding, are a critical tool in being able to articulate that level of service promise that they're making to ratepayers." pipes need to be upsized it's probably not going to be a rehab program.

"More and more though, the agencies are looking to minimize surface disruption. The rehab technologies are getting more cost effective and so providing a greater incentive to do trenchless than what was otherwise available."

Conducting condition assessments will drive the mix of rehabilitation versus replacement, he says. "Knowing what the health of the pipes actually is and what the viable technologies are to rehabilitate them if you can and replace them if you have to."

According to Shea, at one point, the City of Toronto was experiencing approximately 1,500 water main breaks a year, and now, six years later, is down to about 700, through a combination of realigning and replacement.

Thomas points to a successful program undertaken by the City of Calgary over the past few decades that takes a proactive approach to protect and replace aging assets, including water mains. Since 1980, emergency water main repairs have been reduced by 73 per cent. The reduction is thanks to a water main replacement program that replaces corroded mains with new PVC pipe, and by reducing the rate of corrosion through an anode retrofit program that adds cathodic protection to existing water mains.

"They've transitioned away from replacement and are doing almost exclusively now cathodic protection retrofits," says Thomas. "And at a far more cost-effective clip, than replacement alone."

Municipalities are continually thinking about how to renew and repair this critical infrastructure. As municipalities address their infrastructure needs, new technologies and existing methods are poised to play a pivotal role.

However, the use of asset management will continue to be an imperative piece of the puzzle to make sure that linear water infrastructure is rehabilitated and looked after in a proper way, says Todorova.

"It's so important to do rehab in a timely manner—using asset management practice to make sure that linear water infrastructure is looked after properly in a timely manner, because it is such a crucial piece of the infrastructure that [everyone] relies on." *

John Tenpenny is the editor of ReNew Canada.



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Under budget constraints, the town of Fox Creek, Alberta shifted their attention from traditional construction to fabric structures for their multiplex project.

New innovations have made fabric structures a solid choice for complex building projects. *By Eric Donnay*

W ou have to walk before you can run. The most successful building construction operations haven't typically found success overnight. Most began with the basics, using their experience to hone their craft before gradually expanding their scope toward bigger and better things. From there, new experience can be forged, providing the necessary confidence to take on more and more complex challenges.

When thinking about complex facilities, most architects and public infrastructure entities wouldn't identify fabric structures as their first choice. The tension fabric building industry is often regarded as niche, a good solution for housing bulk materials or covering compost piles, but not usually considered for traditional construction purposes. Historically, this assessment was pretty fair, seeing as how most fabric structures came only in pre-determined sizes that didn't allow for much design flexibility or the architectural upgrades necessary for certain projects.

Today, however, this viewpoint is outdated. Leading fabric building manufacturers, combining their industry experience with a willingness to innovate, have advanced their technology and expanded the possibilities for building engineers and users.

The word "complex" is no longer a disqualifier for fabric structures. In fact,

many building applications that might have previously turned to fabric cladding purely as a cost-saving measure have come around to a new understanding: That fabric could be the best overall fit for their project in the first place.

Structural advancement

Classic rigid-frame, I-beam engineering wasn't an innovation to the construction world as a whole, but it was a new concept when Legacy Building Solutions brought it to the fabric building industry a little more than a decade ago.

Prior to this introduction, fabric structures were almost universally erected with hollowtube web truss frames and had to be picked off a menu of standard dimension offerings. It was commonplace for users to have to make a choice between squeezing into less square footage or buying more building than they needed. As you would expect after being forced to adapt to a capital purchase, many customers were unsatisfied with the longterm ramifications of their decision.

On top of this, web truss buildings were usually just basic. If a client needed any particular bells and whistles added, the cost to manipulate the truss framing would send costs soaring, essentially eliminating the cost advantage of going with fabric in the first place.

The change to solid structural I-beams brought instant engineering credibility—

contrary to the subjective designs that too often plagued web truss—and essentially put fabric structures on the same playing field with conventional construction methods, with the added benefits that fabric membrane cladding had long delivered.

At first, the marriage of fabric and I-beam structural steel framing was used in the same type of building applications where fabric had already carved out a place, primarily on straightforward structures that just required a roof, walls and door openings. But as the new approach continued to prove itself and experience grew, some suppliers invested additional resources to expand their capabilities, taking the steps necessary to tackle more complex jobs.

Customization and complexity

With rigid I-beam frame engineering, all buildings get a clean sheet design from the start. Since the process relies upon finite element analysis software, users can customize the building to fit the exact parameters they need and even think outside the box to add unique features to the structure. Designs are rendered relatively inexpensively, and, more importantly, they're done properly.

Backed by proven engineering, structural frame designs give users the ability to implement wide clear spans or go taller when height is needed to account for various



clearances. I-beams can also be individually modified in the design process to account for hanging loads on the structure, such as mezzanines, conveyors, light fixtures, HVAC and fire suppression systems. Water treatment facilities, waste transfer stations, aircraft hangars, and bulk salt/sand storage are among the many applications that frequently utilize a cost-effective, customized fabric building solution.

In many cases, the main structure itself may not be the complex portion of the job. Notable projects have seen manufacturers install a fabric structure over existing attention to detail and through working closely with project subcontractors, fabric building framing members can easily co-exist alongside metal or sheetrock buildouts. Materials like brick and stone can also be used for façades along fabric exterior walls.

Looking good

Even when acknowledging advancements with rigid-frame design, those unfamiliar with modern fabric structures may question what the finished product will actually look and feel like.

A growing market for tension fabric buildings is school or municipal sports

When thinking about complex facilities, most architects and public infrastructure entities wouldn't identify fabric structures as their first choice.

wastewater plant equipment, provide a new fabric-cladded addition to a conventional brick-and-mortar building, and supply multiple buildings at varying elevations that needed to be properly terrain-matched to accommodate a handicap ramp and elevator in a connecting foyer.

The common denominator of all these situations is that the use of rigid I-beam frame engineering makes it possible for fabric buildings to be fitted up with other construction materials. With the proper facilities. Sports complexes have readily adopted fabric solutions, with a big part of the acceptance due to the wonderful aesthetics and ambience produced by fabric cladding. The soft material minimizes echoing, provides abundant reflective lighting, and creates an overall comfortable environment for athletes to perform.

Architectural fabrics themselves have advanced as well. Polyvinyl chloride (PVC) fabric, once reserved for only high-end projects, has begun to replace industry standard polyethylene (PE) fabrics for all building applications, due to some manufacturers being able to supply this superior, longer-lasting product at a similar price point.

In some markets, architects explore fabric roofing because it is highly translucent, allowing natural light to enter and illuminate the structure during daytime hours. For sports and recreation, where a consistent and controlled temperature is usually desirable, it's common to place R30 insulation along the exterior. The insulation is then covered with a fabric liner, keeping the building environment steady while providing a beautiful interior look.

For multi-sectioned complexes, the ability to insulate and maintain environments for different activities—such as having a swimming pool located down the hall from a hockey arena—is critical. And it can absolutely be done within a fabric-cladded multiplex. Rigid-frame fabric buildings are designed to be airtight and meet all required energy codes.

Durability

For applications like composting, salt storage or wastewater treatment, aesthetics and energy efficiency can still be important, but the biggest priority tends to be longevity especially considering the highly corrosive nature of these working environments. While the fabric itself is not susceptible to corroding, attention must be paid to protecting the building frame.



Corrosion was an especially sly enemy for older style hollow-tube truss frames, wreaking havoc by corroding tubes from the inside out. Solid I-beams don't have that same vulnerability, but still require a defense mechanism of some kind to last through the life expectancy of the building.

Galvanizing, either hot dip or inline, has been a traditional go-to method for protecting steel frames for decades. The thin layer of zinc added during galvanizing typically does a fine job, but it comes with a limited service life. The zinc layer is literally sacrificing itself until it's eaten away, leaving the frame unprotected at that eventual point.

As a longer-lasting alternative, manufacturers like Legacy have introduced epoxy paint, a coating that creates a true barrier between corrosive elements and the steel beam. Instead of only slowing the corrosion process like galvanizing, epoxy truly prevents corrosion from ever touching the steel. Furthermore, it is a simple process to prep the surface and re-coat an epoxycoated steel member should it ever be accidentally hit or scratched by equipment.

Practice makes perfect

Not every construction crew in the fabric building industry has the requisite experience working with fabric. When a job is especially complex, using an inexperienced team of installers can be a recipe for mistakes, which obviously cost time and money.

Having personnel who are trained on fabric structures—and who are specifically familiar with a given manufacturer's product is invaluable. It helps guarantee proper horizontal and vertical tensioning of the fabric. It helps with correct termination of the fabric panels and making everything fit as tightly as possible while maintaining a clean finish. And it helps that the crew can quickly adapt to real working conditions, keeping projects on schedule.

Those with experience are naturally going to do it better. Combining that experience with the technology and manufacturing resources necessary to tackle complex jobs has allowed tension fabric structures to move firmly into the conversation for building project success.

Case Study: Fox Creek

Even small towns can set their sights on achieving big dreams and solving complex challenges. About a three-hour drive northwest of Edmonton, Fox Creek, Alberta, is a remote city with a population of just over 2,000 people. The size of the town, however, didn't prevent the community from pursuing plans for a large sports and recreation multiplex. In fact, a primary purpose of the project was to entice people to come to the city.

"We wanted the ability to attract the moms, the families, the kids, and keep people busy because we are pretty isolated," said Kristen Milne, chief administrative officer for the municipality of Fox Creek.

Funding was the first big hurdle. Even after securing successful financial partnerships, the community did not seem to have enough budget to satisfy its long list of wants. That's when they shifted their attention from traditional construction to fabric structures.

Ultimately the city connected with Legacy Building Solutions, a fabric building manufacturer that could deliver the desired facility within the allocated budget. "The building allowed us to get everything we wanted for the price we could afford," said Milne. The project consisted of one large fabric building, divided into three sections—a hockey arena, an aquatic center with pools, and the administration center. Another fabric building, attached by enclosed walkway, contains a full gymnasium. All totaled, the Fox Creek multiplex covered 58,364 square feet.

The rigid-frame design of the structures allowed for simple customization when working with the project architect. Additionally, an interior fabric liner, made of high-strength fabric similar to the ExxoTec PVC fabric used on the exterior walls, was ideally suited to function in the high humidity environments of the swimming pools and hockey arena.

Aside from the architecture, there was added complexity to the project purely from all the coordination needed to stagger all the various trade work in an orderly fashion. Each building section was staged for install before being buttoned up later. For example, after the aquatic center was erected, contractors followed and built the pool inside.

In addition to the main building sections, the finished project contained mezzanines, walking tracks, dressing rooms, a restaurant, offices, a daycare center, and meeting rooms. "We are really happy with everything it's provided for our community," said Milne. "We attracted 30 new kids to our school. And we feel the building is one of the main reasons." *****



Eric Donnay is vice president of Legacy Building Solutions in South Haven, Minnesota.

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Date: Tuesday, Feb. 22 Cocktail Reception: 6:00 p.m. Dinner: 7:30 p.m. Venue: The Carlu 444 Yonge Street 7th Floor, Toronto, ON



APPOINTED



Prime Minister **Justin Trudeau** named his new cabinet after his Liberal party held onto its minority government in last fall's federal election.

Dominic LeBlanc was

Dominic Leblanc

named the new Minister of Infrastructure and Communities, while also remaining Minister of Intergovernmental Affairs.

Other ministers of note include **Omar Alghabra**, who remained the Minister of Transport, **Steven Guilbeault**, who takes over as the new Minister of Environment and Climate Change, and **Filomena Tassi**, who was named Minister of Public Services and procurement.



The Canadian Council for Public-Private Partnerships (CCPPP) named **Lisa Mitchell** as president and CEO.

Lisa Mitchell Mitchell brings 20 years of leadership,

communications and public affairs experience, including a decade in advocating for and advancing publicprivate partnerships (P3s), most recently at Infrastructure Canada as senior director, Investments, Partnerships and Innovation. Prior to that, she served as director, Strategy and Market Development at PPP Canada Inc.

"We are delighted Lisa is joining us, bringing her remarkable industry and public policy awareness and presence to the benefit of the Council and the P3 industry at large," said CCCPP chair **Mark Bain**. "Lisa is an agile collaborator and will be well supported by the Council's strong existing team."

"I am very excited to be joining the Council at such a pivotal time in Canada's P3 market," said Mitchell. "I have seen firsthand the impact partnership between the public and private sector can have on delivering essential infrastructure and services to Canadians. I look forward to the opportunity to engage with the industry in a new and meaningful way, promote the model, and position the organization for the future."



David

Murray

The Association of Consulting Engineering Companies - Canada (ACEC) announced that **David Murray**, P.Eng., SVP, Energy & Resources of CIMA+ was named to the

position of chair of the ACEC Board of

Directors for the 2021-2022 term.

Murray first joined the ACEC-Canada Board in 2016 and served on various committees including the Planning and Governance Committees.

Leading the association out of challenges presented over the past two years, Murray said he sees opportunities for the consulting engineering sector—such the electrification of transportation, the use of green energy, and accessing critical and strategic minerals and metals that are essential for a strong and environmentally sustainable economy. "Canada is unique position to provide strategic resources to the world. Our industry will be instrumental to the sustainable and responsible access and extraction of these resources and our ability to get these resources to market."



Comtech Group Inc. named Hugo Blasutta as its new president and CEO. Blasutta assumed leadership of Comtech as founder Jason Claxton was appointed chair of the Board of

Hugo Blasutta

Directors. Blasutta was previously chair of the company's Advisory Board and is a 40-year veteran in the architecture, engineering, and construction industry.

"After leading Comtech's Advisory Board for almost a year, I have seen the potential in this company, its people and its strategic plan," said Blasutta, "I look forward to continuing to work with Jason, who is a true visionary, and leading this talented team of professionals toward continued profitable growth and operational excellence in providing value-added client services."



Peissel

WSP announced that **Eric Peissel** has been named global director of Transport and Infrastructure.

Since joining WSP in 2001 as a project manager, Peissel has held many

senior transportation leadership roles across Canada. In his new role, he will be responsible for leading the execution of the global strategy for Transportation and Infrastructure, including market penetration strategies, major clients, global growth, internal synergies, innovations, and strategic positioning.

"It has been exciting to witness first-hand how WSP has become a dominant leader in transportation and infrastructure over the past decade. In the coming years we will see significant disruption and advancements due to climate change, social equity, and technological breakthroughs and I am looking forward to ensuring that our business will be future ready," said Peissel.



Francois Lemay **François Lemay** has rejoined WSP in Canada as the new business line executive, Property & Buildings.

François is very familiar with the industry, with 30 years of experience in

property and buildings consulting. He was previously at SNC-Lavalin, where he was regional vice president of Engineering for the National Capital Region, North-Western Quebec and Atlantic Regions. Most recently, he was vice president of the Public Sector for Canada, managing the strategic growth of a portfolio of federal clients.

"I'm looking forward to reconnecting with familiar faces and getting to know new colleagues," said Lemay. "Heading into a new strategic cycle at WSP, we have a lot of great opportunities for growth, and I can't wait for this journey to begin."

Smith and

Fecteau.

WSP Canada is welcoming

two new regional executive

leaders to its team: Angela

Fecteau will be the

company's regional executive

leader for the province of

Quebec. He was with WSP

for 16 years, most recently as

vice president, Energy, ERI,

and he left WSP earlier this

year to pursue an opportunity

outside the company. He has

Sébastien



Angela Smith



Sébastien Fecteau

over 20 years of industry experience and is well known as a leader in the Quebec and Canadian markets.

Smith joins the company as its new regional executive leader for Ontario and Atlantic. She joins WSP from Jacobs where she led a team providing program management services for the Metrolinx-Infrastructure Ontario transit expansion program in Toronto.



R.V. Anderson Associates announced the appointment of **Stewart Dickson** as a principal and leader of its municipal conveyance team, where he will focus on developing multi-year

Dickson

business plans and strategic growth initiatives for the practice. With over 22 years of experience in linear infrastructure, Dickson is a key addition to RVA's award-winning municipal practice, having led several largescale water and wastewater projects in major cities across North and South America throughout his career.



LEA welcomed **Mark Swan** as their new vice president of civil-municipal, for their Canadian operations.

35 years

of

Mark Swan experience working on

multidisciplinary projects in the municipal infrastructure development and environment sectors throughout Ontario and internationally, Swan will focus on enhancing LEA's existing municipal service offering, expanding into new service areas,

With

and securing more diverse projects. "I started my career at an employeeowned firm many years ago. Joining LEA has felt like I am going back to my roots giving me the opportunity to once again experience a close-knit, collaborative, teamoriented culture—this is what attracted me to the firm."



Valerie Lavoie

Stantec welcomed **Valérie Lavoie** to its Montreal office as leader – Power and Energy Transition. With 30 years of experience in the energy and technology sector in Quebec and around

the globe, Valérie will oversee the development and execution of projects to support Stantec's clients in their energy transition efforts in Quebec.

Throughout her career, she has been responsible for engineering, construction management and contract administration on numerous energy and technology infrastructure projects in North America and Europe, particularly in the areas of renewable energy, energy storage, microgrids, smart infrastructure and smart power grids.

"Quebec is playing a key role in the global energy sector remix and having Valérie on our team strengthens our vision of creating a more sustainable and resilient future for our communities," said **Stephen Montminy**, Stantec's regional business leader, Power, Dams & Telecom.



El Halim

Englobe announced Amir Abd El Halim as its new senior vice president, Geotechnical, Materials and Environment, Ontario. He has nearly

20 years of experience in transportation, infrastructure management and pavement engineering. Over the course of his career, he has overseen several large-scale transportation infrastructure projects across North America.

In his new role, Amir will oversee and lead all Ontario activities and will manage all GME operations and ensure strategic growth and profitability.



Elmutaz Elrabaa **Elmutaz Elrabaa**, EDAC, LEED AP BD+C, LEED AP ND has joined HDR's Architecture practice in Vancouver, as project principal supporting the firm's work on large healthcare projects in

Canada. As a key member of the Healthcare leadership team, he is responsible for the dayto-day design and planning activities for the healthcare projects that he leads.

"I am passionate about sustainability in the holistic sense of the word," said Elrabaa. "I believe in designing spaces that are not only healthy for the users but that also promote a sustainable and holistic way of life—thus impacting the users and the community at large positively." *

Send your news and events to john@actualmedia.ca



Brampton's Mayor, Patrick Brown discussed his city's award-winning battery electric bus demonstration trial.

2021 TORONTO GLOBAL FORUM TORONTO, ON

The 15th edition of the International Forum of the Americas' Toronto Global Forum focused its discussion on Redefining a New Prosperity. That included a full day of keynotes and panel discussions on transport, infrastructure and energy.

One of the key discussions on infrastructure centered around the transformation of sustainable infrastructure. A panel that included **Jean-Louis Servranckx**, CEO of Aecon Group discussed the challenges faced by infrastructure that needs to grow to support the movement of people while still being sustainable. Sevranckx noted that investment needs to be made in innovation to help builders keep on schedule and continue to reduce costs for their customers.

On the energy front, the viability of Small modular reactors (SMRs) as an option to reach energy supply security was discussed. **Dale Atkinson**, chief nuclear officer with NuScale opined that SMRs, which can be massmanufactured, built in a more secure way and provide electricity to remote locations, is gaining interest from many nations and that they will be part of energy plans for many, moving forward.

The final panel discussion of the day dealt with how we can transform and adapt our

cities towards greener public transportation. What policies have to be put into effect to implement those changes? The City of Brampton was held out as a shinning example for its award-winning electric bus trial.

"The global-first Pan-Canadian Battery Electric Bus Demonstration and Integration Trial in Brampton is a milestone in environmental sustainability," Brampton's Mayor Patrick Brown told the audience. "We have collaborated our partners to further enhance our city's transit network with great environmental benefits. Brampton is a Green City, and a leader in sustainability." For more information, visit *forum-americas.org/toronto*.



By Arash Shahi

e are currently facing a major housing supply shortage in the province of Ontario (and across Canada), and something must be done. For close to a decade, researchers at the University of Toronto, Ryerson University and others have been exploring why it takes so long to build in Ontario, why the development problem is getting worse, and what can be done to solve the escalating crisis. There are many factors that impact the development process including labour shortages and zoning issues, and it is difficult to address them all, but there are steps that can be taken to significantly improve the situation.

The reality is the development approval process in Ontario is complicated, slow, disjointed, and antiquated. Other jurisdictions have successfully addressed the problem by streamlining and modernizing the process. Ontario needs to follow a similar direction if it wants to address the lengthy approval processes that are resulting in housing supply constantly lagging demand.

Call to action

In the summer of 2020, a coalition of the willing—called One Ontario—was formed. The coalition represents the majority of stakeholders involved in the development process, including the residential and ICI construction sector; planners; mayors, administrators and building officials from every municipality; pertinent software providers; and various applicable law agencies and ministries. The coalition is now calling on the Ontario government to come to the table to support establishment of a Development Approval One Window Data and Information Exchange Standard that will lay the groundwork necessary for streamlining and digitizing the development approvals process. One Ontario is offering a tangible solution, presented to the government by an unprecedented coalition of stakeholders who operate in this space, who understand the problem, and have researched best practices from around the world.

According to the World Bank, Canada currently ranks 64th out of 190 countries in the world on development approval efficiency for routine building projects. We are behind the many jurisdictions that have taken innovative steps to modernize and digitize their systems.

Top-down solution

While some digitization of the building permit process is occurring in various Ontario municipalities, existing e-permitting platforms are siloed, fragmented, and don't take into consideration the up to 45 applicable law agencies involved in broader development approvals. While positive, this route is inefficient and incomplete in scope. The fact is no single municipality can solve this problem on its own without provincial engagement and leadership. The current patchwork of digitization efforts is hindering broader streamlining efforts as municipal, regional, and ministerial agencies each pursue their own unique digital solutions that are not interconnected and therefore restrict interoperability. A top-down approach is necessary to implement impactful modernization. In our situation, this means a solution requires the support of the Ontario government.

Laying the groundwork

One Ontario's proposal will lay the groundwork for a modern solution that will ensure Ontario remains a growing, economically robust, and innovative province. It will also eliminate data silos, giving the government of Ontario the complete transparency and visibility that it needs to facilitate increased housing supply across Ontario.

Developers and builders are trying their best to bring more housing to market faster but are forced to deal with the current regulatory approvals process that is slow and lacks transparency or accountability for applicants. The many stakeholders—from developers and builders to the people of Ontario who are struggling to find homes need the support of the Ontario government to make this happen. *****



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