



September/October 2019

# ReNew

C A N A D A

The Infrastructure Magazine

- + A Future for Hydrogen
- + Designing the Modern Utility
- + Parking the Old Approach

# MASS TIMBER 2.0

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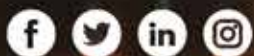
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# WHERE IS THE UPDATE?

By Andrew Macklin

This is getting ridiculous.

Last fall, we were told by the Ontario government's representative of the time, Monte McNaughton, that an update to Infrastructure Ontario's pipeline was in the works and it would be available in the coming months.

We're at 10 months since he made that statement to me. Still no pipeline.

After months of not receiving an update, RFQ's and RFP's trickling out at a snail's pace compared to years prior, and a change in minister (McNaughton and Laurie Scott swapping Labour and Infrastructure), it feels like we are no closer to seeing what the new, revised pipeline will have in store.

It isn't as if you couldn't piece one together, to an extent, based on the announcements made by the current government. Minister of Health Christine Elliott has made several stops around the province to announce funding for further planning of major hospital expansions and redevelopments. The GTA West highway corridor is back on the books despite a laundry list of environmental concerns, and the province has been very clear in presenting its plans for transit expansion in Toronto.

But even with all of that, there still remains much needed clarity, the type a pipeline update would provide. We still don't know if all of the priorities from the previous government will remain as such. We have all witnessed the handful

of non-Toronto transit projects proceeding very slowly (such as Hurontario and Bowmanville GO to name a few). And with the exception of the aforementioned Toronto transit priorities, we haven't seen any real commitment to new infrastructure priorities.

Ontario cannot afford to be at a standstill, biding time in a wait-and-see limbo of construction uncertainty. Ontario has made significant strides in getting projects built, something the Ford government has tirelessly stressed is a priority in public forums throughout the province.

Minister McNaughton did some solid work in his year as Minister of Infrastructure. And I have every confidence that Minister Scott will do the same. But the clock stopped ticking on this several months ago. You could choke on the dust that has accumulated on it.

It's time for this industry to have a clear understanding of what this government sees as priorities for infrastructure development. And not in the form of more rhetoric from a microphone but by presenting it in a clearly understood and defensible document.

Perhaps we could call it the 'Infrastructure Ontario Pipeline' for the lack of a better term. It has a nice ring to it, doesn't it? 🍁

**Andrew Macklin is the managing editor of ReNew Canada.**

[andrew@actualmedia.ca](mailto:andrew@actualmedia.ca)

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**MANAGING EDITOR** Andrew Macklin

**GROUP PUBLISHER** Todd Latham

**PUBLISHER** Nick Krukowski

**ART DIRECTOR AND SENIOR DESIGNER** Donna Endacott

**ASSOCIATE EDITOR** Simran Chattha

**CONTENT AND MARKETING MANAGER** Todd Westcott

**CONTRIBUTORS** Brian Bell, Michel Carreau, Paul De Berardis, Dan Hodge, Steph Larocque, Paul Laughton, Maryline Daviaud Lewett, Andy Manahan, Joe Morgan, Steph Stoppenhagen, Charles Wheeler

**ADVERTISING** Nick Krukowski  
[nick@actualmedia.ca](mailto:nick@actualmedia.ca)

**ADVISORS** Nick Reid, James Sbrolla

**actualmedia**

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Sidewalk Labs has big plans for mass timber in its proposed Toronto development. Will the rest of the province follow its lead? Learn more on page 8.

## CANADA INVESTS IN DATA PROJECT



**The Government of Canada** has announced the Data for Canadian Cities Pilot Project to build data capacity for Canadian municipalities to better plan and implement their investments in public infrastructure.

Since 2014, the World Council on City Data (WCCD)—a not-for-profit organization—has been working with over 100 cities globally to embrace standardized city data to inform better decision-making, and to drive public and private investment in cities of all sizes.

As part of this pilot project, the Government of Canada has approved \$3 million in funding for the WCCD to work with 15 municipalities across Canada to help them become certified under ISO 37120, the first international standard for city data. This is a globally standardized data set that measures quality of life and delivery of municipal services.

This data will enable Canadian municipalities to compare their progress against their counterparts across the country and around the world in a number of domains. These domains include the environment, economy, education, governance, finance, and transportation.

Data compiled through this project will enable these municipalities to better plan and implement infrastructure investments as well as understand the impacts of those investments on economic prosperity and the quality of life of their residents. 🍁

## NEXT ISSUE: NOVEMBER/DECEMBER THE PARTNERSHIPS ISSUE

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## BUSINESS PLAN APPROVED FOR NEW CARIBOO MEMORIAL HOSPITAL

**T**he business plan for a redeveloped and state-of-the-art Cariboo Memorial Hospital in Williams Lake, British Columbia has been completed and officially approved on time and on schedule.

“This project will improve health care in the region, increase necessary services and help retain health-care professionals. In the construction period, it will bring some 1,400 direct and indirect jobs to the region,” said Adrian Dix, Minister of Health.

Work will include a three-storey (plus basement), approximately 9,500 square metre (102,000 square foot) new addition to the hospital, as well as renovations to parts of the current facility.

The cost of the project is \$217.75 million and will be shared between the provincial government, Interior Health, and Cariboo Chilcotin Regional Hospital District.

“The project has expanded since we approved the concept plan in February 2018 with an increase of up to 53 beds. Cariboo Memorial currently has 28,” said Dix.

Features include a larger emergency department, more room for ambulatory care, a mental health and substance use inpatient unit, a maternal services unit—which lets new parents stay in the same room with their babies until they are ready to go home, University of British Columbia Faculty of Medicine space, 71 new parking spots, and the addition of 15 new beds with space reserved to open more in the future.

The redevelopment includes the creation of an inter-faith sacred space on the main floor of the new building, which will allow for traditional, sacred cultural, and healing practices. During the business planning stage, several people and groups participated in planning sessions, including First Nations and Aboriginal groups. As a result, the hospital redevelopment will reflect the unique identity and needs of the local communities.

The project will be design-build, in which a contractor designs and builds the facility to meet standards and performance requirements specified by the health authority. The health authority will retain ownership throughout construction and will be responsible for maintaining the facility over its lifespan. Work will be completed at an energy-efficiency level above the LEED (Leadership in Energy and Environmental Design) Gold standard.

Construction will be completed in two phases. Phase one will begin in 2021 with work on the new addition and is expected to finish in 2023. Then phase two will begin on renovations to the current hospital, which is scheduled to be complete in 2025. 🍁





## Agreement Reached for New Calgary Event Centre

**The City of Calgary**, Calgary Sports and Entertainment Corporation, and the Calgary Exhibition and Stampede Limited have confirmed that they have agreed to fundamental terms and conditions for the development and construction of a new public sports and entertainment event centre.

The agreement lays out the terms of a partnership that will see the creation of facilities to serve as public gathering places for significant events, attract world-leading performing artists, and serve as a new home to the Calgary Flames, Hitmen, and Roughnecks. In addition to the new event centre, the vision for the area adjacent to the facility includes a purpose-built outdoor festival space and infrastructure enhancements to Stampede Park, all of which will serve as a catalyst for the development of Calgary's Culture and Entertainment District.

The estimated cost of the event centre is \$550 million, which will be shared 50/50 between The City and CSEC. With its 50

per cent investment, the city will own 100 per cent of the event centre. CSEC will bear 100 per cent of the operating, maintenance, and repair costs for the period of the 35-year agreement. The city will also receive a facility fee for the lifetime of the agreement and a portion of the event centre naming rights. In addition, value will be created for the city as a result of increased property tax revenue. Local amateur sports organizations will benefit from CSEC's commitment to provide them with \$75 million in added funding over 35 years. All of this ensures there will be a long-term, sustainable return on investment for the benefit of all Calgarians.

"City Council and I had a set of principles that had to be part of any deal, including that any public money must result in public benefit. I'm very pleased that this deal achieves that. It's a good deal for Calgary. This deal makes sense on its own merits and we believe it will help accelerate the redevelopment of East Victoria Park," said Mayor Naheed Nenshi. "Thank you to

CSEC, CMLC, the Calgary Stampede, my colleagues at the city, and especially Barry Munro, who epitomizes the best of service and community building for working so hard to craft a deal that works for everyone."

Located adjacent to the downtown core in East Victoria Park, the project will form part of Calgary's cultural nexus, which includes the BMO Centre, Arts Commons, the Calgary Central Library, Studio Bell, and the National Music Centre.

The Calgary Municipal Land Corporation (CMLC) will lead construction and development management, including public consultation on the project's design, programming, and integration into the Rivers District. CMLC is the city-owned agency responsible for the revitalization of the adjacent East Village for the past 12 years.

Leveraging CMLC's existing management of the BMO Centre Expansion and the execution of the overall Rivers District Master Plan will further enhance the interaction of the facilities and development planning of public spaces within the area. ♣



## \$118.2 million for Northern Klondike Highway Upgrade

**Larry Bagnell**, Member of Parliament for Yukon, announced a federal investment of \$118.2 million to upgrade a portion of the North Klondike Highway.

A 100-kilometre section of the highway, which connects Whitehorse to Dawson City, will be rebuilt to accommodate increased truck traffic and be more resilient to the effects of changing climate. This project will significantly reduce ongoing maintenance costs on this section of the highway.

The work includes:

- Upgrading seven segments of the highway, reducing the length of highway that requires seasonal load restrictions, and improving climate change resilience;
- Rebuilding McCabe Creek Bridge and Moose Creek Bridge; and
- Replacing Crooked Creek Bridge.

"Transportation and distribution of goods and people are a vital part of our

local, regional and national economies. The investment announced here today will make our transportation system stronger by reconstructing parts of Yukon's North Klondike Highway and fostering long-term prosperity for our community," Bagnell said.

Projects in the North receiving funding are supporting transportation infrastructure such as ports, airports, all-season roads and bridges and will enhance safety, security, and economic and social development in Canada's three territories. ♣



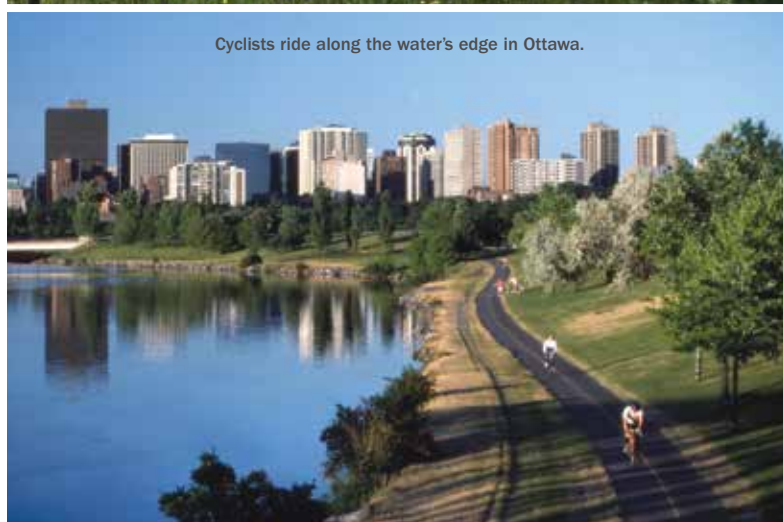
Photo: Frank Zechner



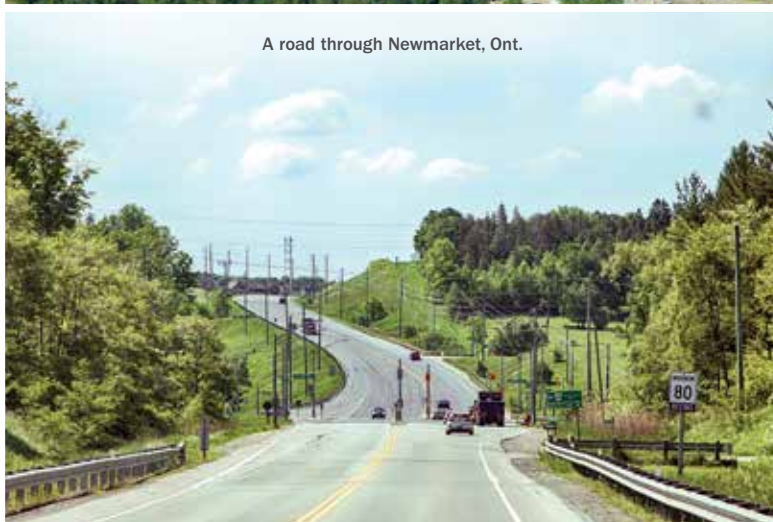
The Station Street bridge and dam in Erin, Ont.



A wastewater treatment plant in Ontario.



Cyclists ride along the water's edge in Ottawa.



A road through Newmarket, Ont.

## REPORT BUILDS THE CASE FOR MCEA REFORM

**The Municipal Class Environmental Assessment** (MCEA) process in Ontario is broken. Multi-year delays are now common. Communities are throwing away money, and losing key opportunities for economic growth. The time for reform is now!

Our sixth report on MCEAs, “Case Studies that Support Ontario’s Municipal Class Environmental Assessment Process,” provides concrete examples of the lengthy delays that this duplicative process has caused at a substantial cost to Ontario communities.

“Under the current regime, rebuilding aging structures or constructing new infrastructure is taking too long under the MCEA process, especially when Ontario municipalities must ensure that our public works are more resilient to withstand severe weather events,” says report author Frank Zechner, an environmental lawyer and engineer. “Delays have impeded positive outcomes such as sewage system upgrades.”

Nine of the 12 projects studied in this report experienced process delays of more than two years. At least half of the projects involved consultant and report costs of over \$500,000, and at least four cost \$2 million or more.

Delays are outrageous. Costs have escalated. But there are solutions.

The report provides nine recommendations for reforming the MCEA process. These recommendations provide tangible actions that will simplify the process and eliminate the guessing game over the length of time for when approvals can be achieved. The recommendations will also streamline the process for all parties involved.

Municipalities need to focus limited infrastructure budgets on the construction and rehabilitation of assets, instead of a complicated process for environmental assessments.

Ontario’s government intends to modernize the process – your support and input would be helpful. Please contact your local MPP.



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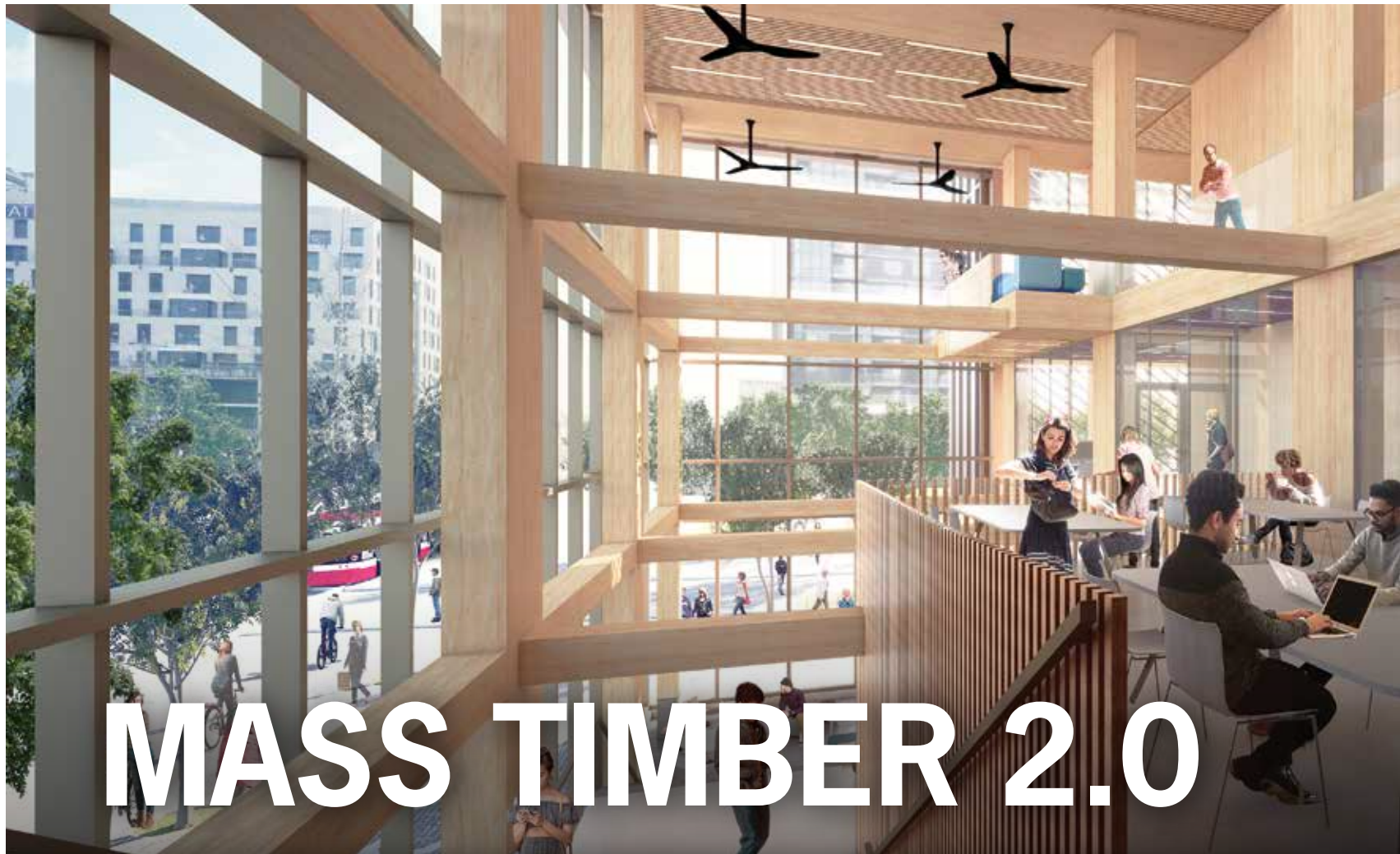


@\_RCCAO

p: 905-760-7777

e: [media@rccao.com](mailto:media@rccao.com)





# MASS TIMBER 2.0

Exploring opportunities for the growth of mass timber in Canada. *By Andrew Macklin*

**T**he adoption of mass timber has been slow in Canada. There is a lack of knowledge of the material among project owners, zoning and building code regulations have not kept pace, and in some cases, the market isn't fully aware of the life-cycle and environmental benefits that mass timber construction can offer.

But the slow and steady growth is creating skylines where cross-laminated timber structures, and those built with other forms of mass timber products, are emerging from the masses of concrete and steel that have traditionally dominated the landscape. Projects already built, and currently under development, in British Columbia, Ontario, and Quebec are improving people's perception of a material once proclaimed to be too flammable to be sensible by its stalwart opponents.

Like any other emerging trend, there are barriers to success. Being able to scale up production, making appropriate changes to current policy, and the need to train an industry on building with a new material are challenges that must be overcome if mass timber is going to become a part of the everyday conversation for building procurement across Canada.

In June, ReNew Canada convened an

expert discussion with industry stakeholders from across the country in order to better appreciate the barriers to mass timber's growth in Canada, and how Canada can best position itself to capitalize on the global movement, pegged by U.S. researchers to be 150-230 per cent from 2017 to 2025.

## Moving the needle

Mass timber has already been demonstrated in Canada, although on a limited basis and at a limited scale.

British Columbia has been the standard bearer for adoption of mass timber construction, not surprising based on its vast supplies of wood products and commitment to carbon emission reductions. The province has recognized both the economic and environmental benefits of construction using cross-laminated timber (CLT) and glulam, and has already created such landmark projects as Brock Commons at the University of British Columbia and the Wood Design and Innovation Centre in Prince George. At the time it was completed, in 2017, Brock Commons represented the tallest timber structure in the world.

It was October of that year when the Ontario Ministry of Natural Resources and Forestry released its Tall Wood Building

Reference for construction of six-storey mass timber structures. That document provided a technical roadmap for how to develop tall wood solutions under the provincial building code. Coupled with the opportunities for pilot and institutional projects, the six-storey guidance has helped drive awareness and has led to a few more projects to emerge as pilot projects in the 7-12 storey range (George Brown College and the University of Toronto). But the adoption in Ontario has still been slow.

The impending update to the National Building Code could change that. According to Michael de Lint, director of building regulatory reform and technical standards for the Residential Construction Council of Ontario (RESCON), those changes are expected to come into effect in the latter part of 2020, and would open the door for 12-storey mass timber construction.

## Barriers beyond the code

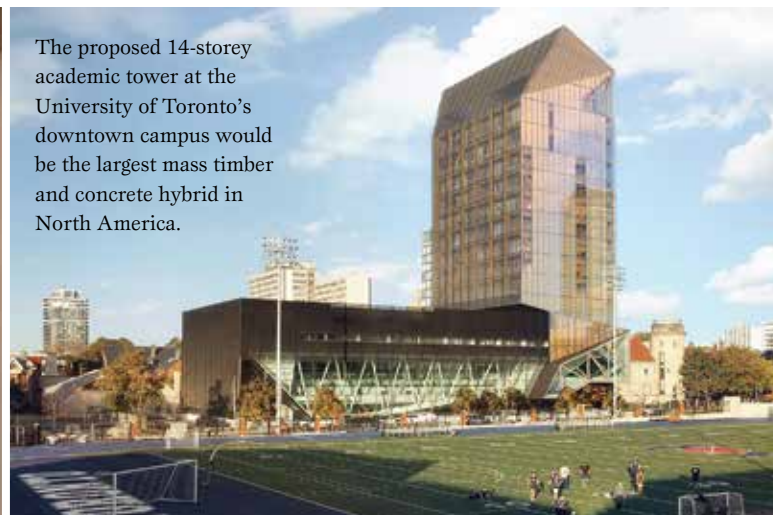
Even with provincial and national building codes opening the doors for the expansion of mass timber use in residential, commercial, and public sector construction, there are still hurdles to overcome that could stunt, or halt, the progress being made.

From a municipal standpoint, education



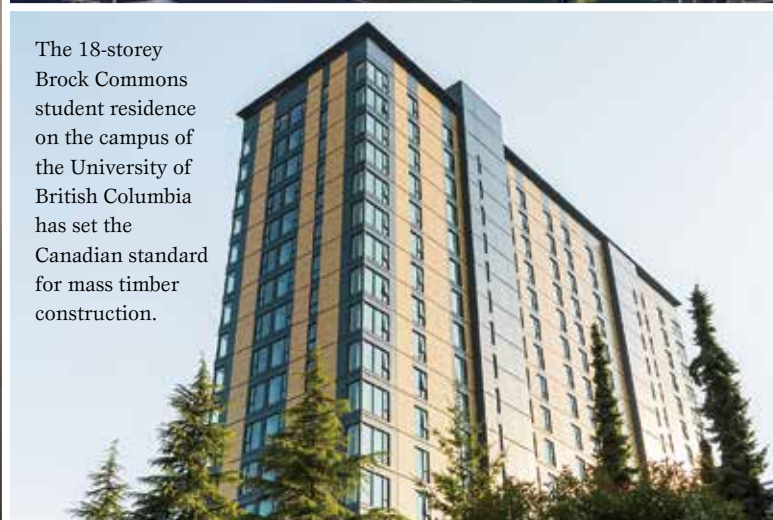


The \$130-million Arbour project at George Brown College's Waterfront campus integrates engineered wood products throughout the structure, providing a healthier indoor environment for students and staff alike.



The proposed 14-storey academic tower at the University of Toronto's downtown campus would be the largest mass timber and concrete hybrid in North America.

Credit: MAMPA/Parsons Architects



The 18-storey Brock Commons student residence on the campus of the University of British Columbia has set the Canadian standard for mass timber construction.

Credit: UBC

and zoning stand out as the two primary areas of concern. And while it is important for all impacted municipal staff members to understand the values of building with wood, the drive to do so must be provided by the people in leadership positions.

"Unless you have that downward pressure from the government on the various departments, the change won't happen

viability of the products involved in mass timber construction, there are buildings right in Ontario where the values of using these products are on display:

- Brantford's Wayne Gretzky Sports Centre became the first commercial building in Ontario to use CLT, along with re-used glulam;

well documented, as are the lower emissions that are involved in the production of wood versus alternative building materials. The safety of mass timber products have been called into question, particularly by materials competitors in the concrete and steel industries. However, all North American CLT suppliers have to have their products tested to meet ASTM (American Society for Testing and Materials) E119, which demonstrates a two-hour fire resistance rating (FRR). FPInnovations, a national private not-for-profit organization that specializes in "the creation of solutions in support of the Canadian forest sector's global competitiveness", has accredited testing labs for CLT products in B.C. and Ontario.

As for the financial benefits, those are best realized when looking through the long-term lens, appreciating the long-term operational savings that mass timber can create.

"There might be more upfront cost," explains Marianne Berube, executive director of Wood WORKS! Ontario. "But you've got to look at the life-cycle of the building."

According to Andrew Bowerbank, the director of sustainability at WSP, mass timber presents the same sort of low carbon economics that we have seen with electric vehicles, smart technologies, and renewables. And similar to the evolution seen with the green building sector, the life-cycle benefits

## All North American CLT suppliers have to have their products tested to meet ASTM E119, which demonstrates a two-hour FRR.

easily," said David Moses, principal at Moses Structural Engineers.

Having champions at the highest levels of government, be they mayors, councillors, reeves, wardens, or perhaps influencers among provincial and federal government representatives, will take an uptick in education and lobbying. The Canada Wood Council was formed to educate the country on the overall benefits of wood, and along with the newly formed Mass Timber Council, has taken the lead in providing on the benefits of tall wood construction.

If municipal staff need verification of the

- Glulam beams and CLT panels are featured prominently in the Orillia Waterfront Centre; and

- Part two of the Laurentian Architecture project (based in Sudbury) features a two-storey structure built with CLT and glulam.

These provide just a handful of the examples where institutions and municipalities have recognized the health, safety, and financial cases for utilizing mass timber products for community spaces.

The health benefits of exposed wood are



A rendering of the new headquarters for the Toronto Region Conservation Authority, which will include engineered wood products.



Weyerhaeuser makes laminated veneer lumber (LVL) at its mill in Kenora. But as of right now, no company produces glulam or cross laminated timber in the province. That has added to the cost of the products, but also the length of time it takes to get the building products. Cindy Gouveia, president of the George Brown College Foundation, noted that the school will have to wait 18 months and tie up millions of dollars in order to obtain the mass timber products needed for the construction of The Arbour.

Building a mass timber products industry in Ontario makes a lot of sense and cents. A push for mass timber products in southern Ontario has the potential to create an economic boom for northern Ontario. Abandoned sawmills in small towns that relied on booming sawmills for survival could be reopened as CLT/glulam/LVL mills to meet the demands of a growing mass timber industry. Or, the addition of CLT/glulam facilities at existing sawmills could severely reduce the potential for a second shutdown, resulting from lower export demand and the like, thanks to the diversification of the mill's products.

There is no shortage of wood available to support exponential growth in the mass timber industry. According to Natural Resources Canada's 2018 State of the Forests report, an estimated 767,000 hectares of forests were harvested, producing nearly 155 million cubic metres of industrial roundwood. It is estimated that Canada has an annual sustainable wood supply of approximately

of the environmentally friendly technologies have made higher upfront costs negligible from the lifecycle perspective.

This is the case for a proposed building project currently being worked on by Carol Phillips and her team at Moriyama and Teshima Architects (MTA). Her client is looking through that same long-term operating costs lens and realizing that, using that model for building procurement, mass timber or potentially hybrid mass timber become viable options for the building materials to be used.

MTA, along with Acton Ostry Architects, won the design competition for the mass timber building known as The Arbour. The new 10-storey structure, to be built on a 0.23-acre brownfield site as part of George Brown College's Waterfront Campus, will house the college's School of Architectural Studies and the School of Computer Technology. It will be home for a mass timber research hub, which the college will integrate into its existing construction industry programming.

That addition is key in addressing the final key barrier not yet mentioned: industry education. As mass timber is a fairly new building material in Canada, there aren't a large amount of opportunities for education, be it design and architecture, construction, or material maintenance. But as institutions learn their own lessons in the use of the material, like George Brown and the University of Toronto, there is the chance to provide wider industry education. This is much like what is now underway at Hamilton's Mohawk College, where its net zero facility has not just become a tool for student education and engagement, but also an example for the industry to learn from.

There is work being done already on educating contractors in Ontario, thanks primarily to the work being done by Mike

Yorke and the Carpenters Union. They have established the College of Carpenters of Applied Trades in Woodbridge, a suburb of Toronto, where CLT, glulam, and nail-laminated timber (NLT) construction is being taught through hands-on courses.

### Scaling up

The ability to replicate the CCAT's programming will be a key factor in Ontario's, and the rest of the country's, ability to scale up the use of mass timber if its use sees the predicted exponential increase in the next five years.

Some procurement regimes are already moving  
towards outcomes-based systems,  
which is where mass timber can best be presented.

It was thanks, in part, to funding from Ontario Ministry of Natural Resources and Forestry that CCAT was able to get off the ground. The province approached CCAT in 2017 to see if there was an opportunity to build a mass timber training program, since such a program did not exist in Canada. With the four-week course now up and running, Yorks believes that similar programming could be established in other parts of the province should the demand warrant it. And as the aforementioned George Brown College program gets off the ground, that will also set itself up to address the forthcoming demand for training in mass timber construction.

One of the biggest hurdles to overcome right now is the supply chain. At this moment, only one company in all of Ontario is producing engineered wood products for mass timber:

223 million cubic metres, over 40 per cent greater than current harvest levels.

One step forward has already been made for the Ontario supply chain, as Element5 has announced plans for a \$32 million CLT/glulam plant to be located in St. Thomas, with a \$5 million investment from the provincial government. This is Element5's second such plant, with one plant already established in Ripon, Quebec approximately 100 kilometres northwest of Ottawa. However this will be their first venture into Ontario, choosing to place their plant closer to the materials market rather than the wood supply.

### Market opportunities

As the new building code is ushered in and municipalities loosen zoning by-laws once they become educated on the inherent value





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of engineered wood materials, there will be significant opportunities to integrate mass timber in facilities beyond educational buildings, municipal sports and recreation centres, and corporate head offices. In British Columbia, Brock Commons and the proposed six-storey affordable housing residence at UBC Okanagan in Kelowna are opening the door to the use of CLT and glulam in the construction of multi-residential buildings. And according to Moses, engineered wood products present a real opportunity for some types of bridge replacements, inserted in a similar fashion to what is already seen with concrete rapid bridge replacements throughout Ontario.

Mid-rise residential seems the most likely secondary market for the use of engineered wood products in construction, especially in scenarios where governments are contributing some funding and lower long-term expenses are important for the end user, such as affordable housing complexes and long-term care facilities.

### Next steps

So how does the mass timber industry drive its potential for exponential growth in

Ontario? It starts with education. The wood industry has a long way to go in educating government stakeholders, asset owners, and the general public on the values of building mass timber structures using engineered wood products. The Canada Wood Council and the Mass Timber Council are key players in that education, as are the institutions and communities that have chosen to incorporate mass timber. These are the industry's ambassadors that can sing the praises of the benefits they have already reaped from the choice to go with wood.

On the construction industry side, there is expertise quickly being built within Ontario. Companies with international footprints are looking to their European partners for a better understanding of the situations where CLT, glulam, NLT, LVL and others are smart choices in overall building construction. Others are learning from resources closer to home, gaining their education from the successful projects that have emerged in British Columbia, Quebec, and parts of the United States. engineered wood

Then, the key will be the procurement process. Some procurement regimes are already moving towards outcomes-based

systems, which is where mass timber can best be presented. This will allow for life-cycle costs, rather than just upfront costs, to be evaluated and give engineered wood products the potential to present similar or better value than traditional building products.

Much like what we have seen with recent modular infrastructure projects, such as the Humber River and Mackenzie Vaughan hospitals, the decision to incorporate mass timber needs to come at the beginning of the procurement process, rather than an after thought after the initial design is complete, just like other elements of the project design that provide tangible environmental benefits, such as building envelopes, integration of renewable energy assets, and green roofs.

When they build it, you should come. There is no better time to learn how mass timber infrastructure can build healthy, environmentally friendly communities. 🌱

**Andrew Macklin is the managing editor of ReNew Canada.**



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Access to connected vehicles, ones that provide last mile transportation solutions, will be critical for future mobility in large urban centres.

# UNLOCKING THE FUTURE CITY

Why mobility may make or break cities as we know them.

By Steph Stoppenhagen and Maryline Daviaud Lewett

Future city efforts (and concepts) have been around for ages. Ancient Rome's aqueducts, the Paris and London sewers, and the New York City subway system are just a few historic examples of forward-looking city infrastructure projects that have played a critical role in improving residents' quality of life and extending the reach of their urban core. More recently, technology has enabled new opportunities to improve city living through programs to sync street lights, facilitate the interoperability of public safety systems and fleets, and apply data analysis to improve healthcare, crime prevention, and other civic services. But looking ahead, future city planners must also reconcile two connected megatrends—increasingly distributed infrastructure and advanced mobility—to successfully transform the cities and counties of today into communities of the future.

For years, many smart city programs have lacked a cohesive master plan, certainty of funding, or worse - became mired in jurisdictional disputes between city agencies, the private sector or a combination of the two.

Increasingly however, efforts are underway to set up the foundational communications infrastructure and smart sensor networks that will facilitate the development of smart corridors and connected communities. This reflects an evolution from isolated projects towards a more comprehensive programmatic approach.

With this concept in mind, urban innovators are also trying to redefine the concept of infrastructure or create centers where people want to spend time, work and connect. For example, much of WeWork's profile has been built around their efforts to develop attractive meeting hubs that foster collaboration and a sense of place. They too are exploring solutions to the larger citywide issue of transportation as many workers are

in need of commuting solutions.

Vehicle technology has made critical leaps forward that can help guide city planning. Smart electric and autonomous vehicles have established their long-term viability, and emerging technologies like electric vertical takeoff and landing (eVTOL) aircraft, once the purview of *Blade Runner* and other

The key for cities is to start planning the grid now  
for the electrification of transportation at scale.

futuristic tales, are expected to impact how cities plan and evolve sooner than one would think.

## EV adoption continues to gain traction

It's easy to be skeptical about technology associated with automobiles, assets known to depreciate as soon as they are purchased, being the key to future cities. But the



statistics reveal that the widespread adoption of electric vehicles in markets around the world is well underway as environmental regulation, purchase incentives, and shifting consumer preferences evolve. Wider access to EV charging networks and utility support are also speeding change in an industry whose sales approached 79 million total cars worldwide in 2018.

In September 2018, the U.S. auto market, now the world's second largest auto market behind China, surpassed one million plug-in electric vehicle sales. Full-year totals reflected a 30 per cent increase in overall sales, while in Canada, sales increased by more than 125 per cent from 2017 signifying the transition to EVs has reached critical mass.

Global OEMs continue to announce the addition of dozens of new car models targeting families (SUVs), performance vehicle enthusiasts and more. Volvo is expected to move its entire vehicle lineup to electric, forecasting EVs will account for half of its global sales by 2025, and Volkswagen recently bumped its forecast to 22 million electric cars delivered by 2028. Industry watcher AlixPartners' recent report found

that "\$255 billion in R&D and capital expenditures is being spent globally on electric vehicles, and that some 207 electric models are set to hit the market by 2022."

### Charging tomorrow's cars and fleets

With these trends in full motion, the challenge of how to provide power to propel the next generation of transportation becomes more and more critical. Many potential and current EV drivers remain concerned about access to charging when and where they need it. While Canada has seen the deployment of several proprietary charging networks, access remains limited in many communities outside the home.

Overcoming the charging access issue is complex. Charging as a Service (CaaS) and Energy as a Service (EaaS) providers and electric utilities recognize that future demand from the electrification of transportation cannot be supported by most local grids today. New EV load centers will be both distributed and concentrated. Unlike traditional energy loads, this raises questions about the availability of infrastructure in high-cost areas or those restricted by zoning,

and that only covers EVs for private use.

Significant investments will also be required to support the higher capacity (250kW+) DC charging needs of transit buses, Class 4/6 medium-duty fleet vehicles and Class 8 heavy-duty commercial trucks utilizing existing centralized infrastructure.

For example, the New Flyer Xcelsior CHARGE features batteries ranging from 160kWh-620kWh. These vehicles require charging capacity (depending on the number of vehicles) that can necessitate new service line extensions (up to 1MW of additional load), conversion to medium duty voltage service (over 2MW), new feeders (over 5MW) or new substation transformer and capacity increases (over 10MW). Early studies of eVTOL charging infrastructure indicate demand loads consistent with large transit buses and semis trucks.

### Integrating transportation and future city planning

The key for cities is to start preparing the grid now for the electrification of transportation at scale. Late 2020 is expected to see the arrival of larger volumes of electric buses, vans and trucks to hit the



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llee@dbrs.com

**Grant Headrick**

Managing Director,  
Infrastructure Finance  
+1 (416) 597 7393  
gheadrick@dbrs.com

**Andrew Lin**

Managing Director,  
Energy and Project Finance  
+1 (416) 597 7453  
andrew.lin@dbrs.com





As electric vehicles increase their stake in personal automotive sales, cities must be strategic in their placement of electric vehicle charging infrastructure.

market and the pace of production will grow exponentially from there. As recent headlines surrounding the challenges of launching EV programs on the U.S. East Coast indicate, failure by electric utilities, and increasingly, fleet operators and CaaS/EaaS providers to move rapidly means the required infrastructure may arrive too late and create a major speed bump in future adoption.

Other considerations for integrated transportation and future city planning are:

**1 Covering the Last Mile.** Electric scooters and e-bikes have been adopted widely in some cities, while pedal bikeshare programs have also garnered some interest. But these solutions may not be practical for the elderly, disabled or younger youth. Autonomous vehicles, expanded and incentivized rideshare programs, and eVTOLs may each play a role in solving the last-mile hurdle particularly as cost-of-use falls.

**2 Inclusive City Planning.** Another area the future city must account for is the temptation to gear Future City programs to more affluent communities/neighborhoods. Smart mobility is actually one of the largest challenges facing low-to-middle income communities and continues to expose the flaws of many transit systems. If public transportation can get a passenger to a point close to their

destination, there remains significant populations that still struggle with covering the last mile amongst other access challenges.

**3 Maximizing Infrastructure.** As we plan for the future city, the electrification of transportation must also be coupled with efforts to maximize the utility of existing assets, like roadways and buildings, to transform the mobility landscape. Future city efforts like those underway in Boston, include evaluating the role of parking in the livability and business friendliness of the city, reflect growing optimism that technology can improve efficiency. Boston's pilot program is aimed at improving the efficiency of roadways by removing street parking, focused at prime hours of city deliveries and offers hope to those looking to alleviate or eliminate congestion in densely populated, physically constrained spaces.

**4 Leveraging Next-Gen Communications Technology.** Foundational communications infrastructure is the lynchpin for enabling these smart technologies to perform to their full potential. By leveraging faster 5G mobile and fiber optic networks and greater connectivity, cities can implement a myriad of efficiencies such as working with businesses to better schedule the delivery of goods within a community.

## More convenient, cleaner future and accessible locations for all

It no longer takes much imagination to envision a seamless errand trip in which there is no need to look for parking. Or to imagine fewer accidents as road safety improves, creating compounding citizen and city effects of saving fuel, saving money and improving air quality, improving the quality of life along the way.

While light-rail and subways systems can be viewed as superb examples of efficient electric vehicles, AVs evoke all that's possible when technology, automakers and cities share the common goal of making life better while meeting cities emissions goals. Like allowing you to work, sleep or relax while being transported to your preferred destination, freeing you of the strains of driving. And beyond sparing you time, the future city will resolve nagging quality-of-life issues that today can be hard to measure and even harder to find. 🍁



**Maryline Daviaud Lewett leads sales and partnerships in distributed infrastructure and sustainable transportation for Black & Veatch's transformative technologies business. Steph Stoppenhagen is a business development director for connected communities at Black & Veatch.**





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# SURVEILLANCE SOLUTIONS

How security and surveillance technology is positioning critical infrastructure for the future. *By Paul Laughton and Joe Morgan*

An effective, modern approach toward protecting and monitoring critical infrastructure (CI) can ensure safe operation and maintenance of highly volatile working environments, while allowing for continued operation without significant downtime due to theft, vandalism or hazards affecting the greater economy or community.

Vandals are drawn to power-generation infrastructures. The solar and wind power-generation facilities operated by global power company GDF Suez are vast installations set in remote areas of Ontario. Security was their main motivation for installing cameras with lighting technology for the evenings. They help patrol the surroundings by providing in-camera analytics to detect motion and trigger alerts. The entire system is connected over fibre to central GDF Suez facilities, where the data is stored on two terabyte video servers. GDF Suez staff can view the feeds on computers, tablets and their smartphones. The analytics from the 24/7 recordings have proven to be very

effective, now they are also using them for the maintenance and management of their equipment. They take regular snapshots of the far-flung equipment to monitor issues such as snow loads on their solar panels.

Modern surveillance solutions for critical infrastructure have advanced significantly, thanks in part to several trends such as video analytics, machine learning, artificial intelligence and the Internet of Things (IoT) concept. These advancements have taken surveillance systems far beyond the provision of security and into new realms in which Internet Protocol (IP) cameras become the digital eyes and ears that oversee a facility. The data and analysis generated can help organizations better safeguard against operational crisis as well as help towards protecting employees and the surrounding community.

## Surveillance solutions reveal operational efficiencies

Network surveillance technology allows plant managers observe exactly what is happening at

multiple sites from a central, remote location while adding an extra layer of intelligence to their existing systems. Connected cameras can be easily integrated into the facilities' system to seamlessly work alongside other security solutions, from alarms and public announcement systems to access control solutions and sensors that monitor the state of equipment. Audio used in the CI space for mass communication to deal with plant evacuation can deliver instructions for shelter. Currently, more radio-based communications are used and with VoIP and IP speakers, these can be rolled out into the overall networked systems at these facilities.

This means there's a synergy between the security and safety technology that run off the same system, and all the data collected can be centrally aggregated to provide increased intelligence and insight into facility operations. Data analysis provides key insights, such as intelligent facility management, an increased ability to detect anomalies and perform predictive maintenance. They can also benefit by having remote intelligence, situational



awareness, emergency management as well as opportunities to provide advanced asset performance control.

An open network surveillance solution can also be integrated with production monitoring systems, such as Supervisory Control and Data Acquisition (SCADA) system. SCADA indications through surveillance solutions can help save on time and costs by providing process verification to confirm abnormalities, check if an alarm is valid or if a sensor is operating correctly. This allows organizations to visually verify production and temperature data and assess reported failures across multiple sites from a centralized location. In hazardous environments like oilfields, where workers are tasked to be the “eyes” at multiple well sites, intelligent devices can now assist and monitor the sites on an around-the-clock basis.

### Thermal cameras for challenging conditions

Another valuable addition to CI facilities are thermal cameras which are uniquely capable of detecting people, objects and incidents in shadows, darkness, or in difficult environmental conditions such as smoke and

dust. Thermal cameras are ideal for perimeter or area protection in large facilities because they provide a powerful and cost-effective alternative to electrified fences, floodlights and radio frequency-based intruder detection. Plus, they can be very discreet since they don’t require lighting to operate, offering a significant advantage in detecting activity in remote places, such as copper thieves operating in distant unmanned sub-stations. Thermal cameras can also detect people roaming around a site after business hours or during emergency evacuations such as a fire.

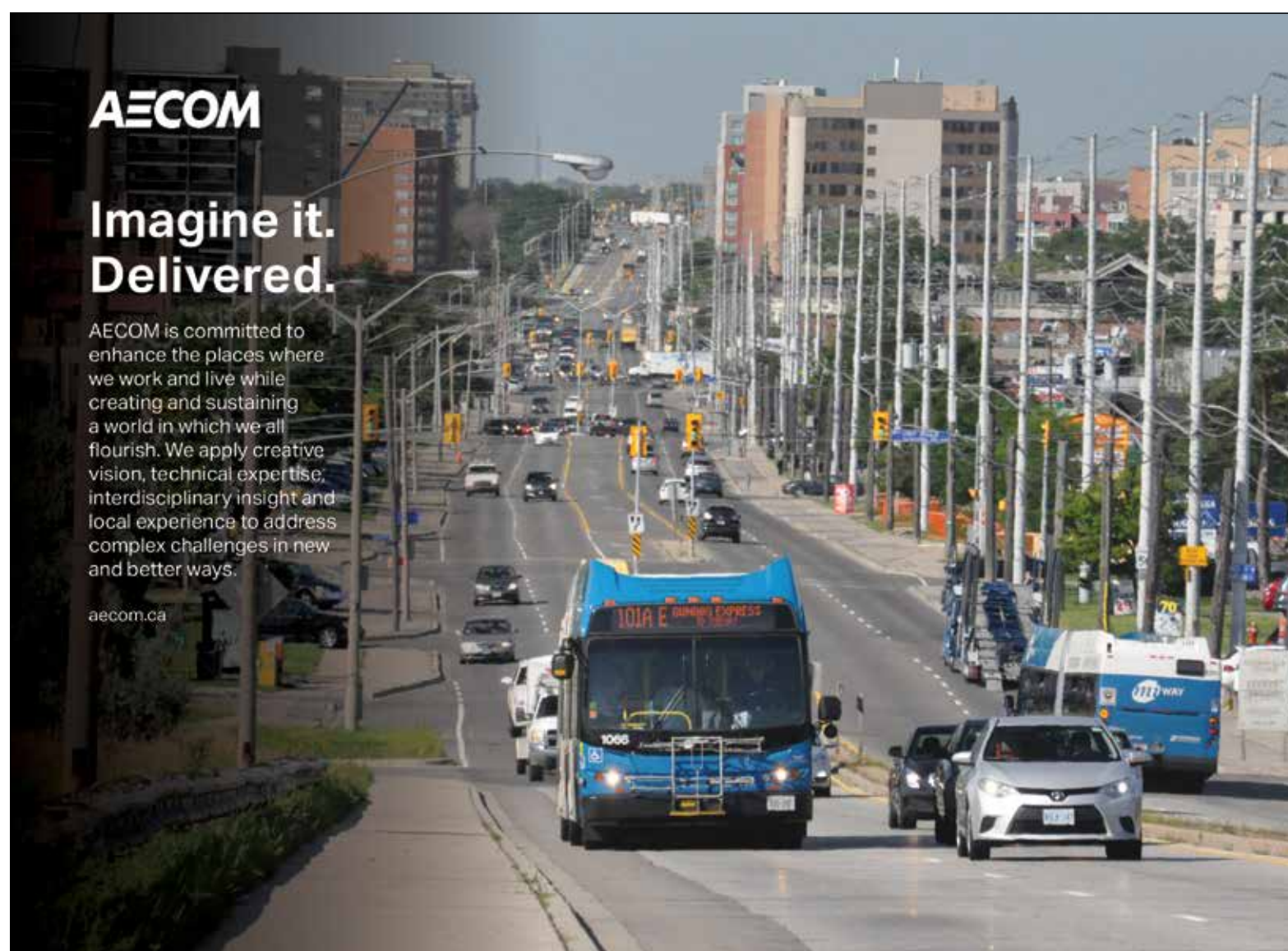
Where thermal cameras really shine is in process engineering where they can continuously monitor temperatures and rapid changes in temperature—upper and lower limits as well as the rate of temperature change. If they detect variances outside of a pre-set threshold, they can trigger an alarm for on-site or remote operators. Onboard analytics use an isothermal colour palette to highlight specific temperatures in the scene, an operator can then zero in on a spot temperature by clicking in the frame and the camera will measure the temperature within that specific window. This feature is especially useful for visualizing hot spots, identifying overheating equipment and

blocked or leaking pipes. Thermal cameras can also provide an early warning signal to security and surveillance teams that flammable material such as dust or oily rags are about to combust. Other possible uses for thermal cameras include inspecting tank levels, monitoring flare stacks at refineries and predicting transformer and switch gear failures at power substations to forestall outages.

### Surveillance and privacy concerns

Nowadays, surveillance cameras are a common sight in public places. In 2016, there were thought to be nearly 350 million surveillance cameras worldwide. This underscores the need to understand how the data they are collecting is processed and stored. Although most individuals living and working in large cities understand and accept the need for security cameras, some technologies raise privacy concerns. Facial recognition, though not yet widespread, is already being used by several police forces in Canada. It’s reasonable to expect that overtime, as with most new technologies, more CI facilities and institutions will adopt it.

At the same time, public awareness of privacy rights has been heightened by initiatives





like the General Data Protection Regulation (GDPR) in Europe and the Federal Information Security Management Act (FISMA) in the U.S. To respond to those concerns, three techniques have been developed: dynamic anonymization, permanent masking and redaction. With anonymization, people in a video are automatically masked and can only be unmasked by authorized personnel. Permanent masking anonymizes everyone in a video and permanently burns the masking into the footage, so there's no way to undo it. Redaction is undertaken once an image has been caught to protect the privacy of non-relevant individuals, commonly used when an organization must share un-anonymized footage with law enforcement as part of an investigation.

Along with the above approaches, some non-visual surveillance technologies naturally lend themselves to privacy protection. For example, thermal cameras are often used in sensitive environments like healthcare, so patients can be observed remotely without capturing personal details. Patient information privacy is mandated by the Personal Information Protection and Electronic Documents Act (PIPEDA) in

Canada, but as privacy demands increase this higher level of privacy could well be extended to other arenas and institutions.

### Cyberthreats to CI

Recent headlines have been highlighting cybercriminals and the frequency with which they threaten to attack CI facilities. Malware designed to allow the taking over of operations and process are occurring and they are difficult to detect. In April 2019, a small city in Southwestern Ontario had their critical assets compromised by a cyber ransom attack and their municipal data was held hostage. Other Canadian cities have experienced the same type of extortion, unfortunately, and some have felt compelled to pay large ransoms to get things back up and running.

While protecting CI from cyberthreats is an ongoing effort which requires constant vigilance, like all effective security, cybersecurity is about the depth of your defense. Critical infrastructure targets can be hardened, and physical security improved through the early detection of threats and a layered awareness approach. Sourcing IP cameras from manufacturers who consciously build and upgrade with the most recent

cybersecurity defense software is a good first step. With connected cameras, organizations can quickly and remotely identify and remedy any issues if cameras have been hacked, but ultimately the key is to find a supplier who is relentless about staying on top of malware and other sophisticated cyberthreats and constantly innovating their solutions for a smarter, safer world.

The same network surveillance that so effectively protects critical infrastructure from criminals can also simultaneously prevent inefficiency and costly downtime in an organization's operations; in effect, it's a modern security system that doubles as a business tool. 🍁



**Paul Laughton is the architect and engineering manager at Axis Communications. Joe Morgan is the business development manager for critical infrastructure at Axis Communications.**

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# A FUTURE FOR HYDROGEN



Regulatory and cost barriers currently exist, but green hydrogen could very well emerge as a green fuel alternative of the future.

## An underutilized resource for Canada's green energy future. *By Michel Carreau*

**T**he city of the future, to me, is one that is energy self-sufficient, powered by renewable power with zero greenhouse gas emissions. This self-sufficiency translates into greater autonomy, energy resiliency against utility grid outages, and protection from energy price hikes, resulting in reduced costs for the city. The city of the future will build on the sustainable development principal: maximizing local resources, creating local employment, and keeping the environment clean.

Today, city resource requirements for energy are composed principally of electricity, heat, fuel, and water for equipment electric power, building heating, transportation, and various other population usages. In terms of electricity, the city requires interconnection with the utility, as well as the use of grid electrical power when needed, or the ability to sell its power surplus back to the grid.

Ideally, the city of the future should have its own microgrid and distributed energy resources, such as solar power, wind power, biogas/wood pellet power generation, and energy storage. Think wind and solar power

on building tops and, where possible, at legacy industrial sites too contaminated for major future development. Energy storage is needed to tame renewable power variability: storing excess energy and restoring its stored energy during periods of low availability (i.e., when the sun doesn't shine, and the wind doesn't blow). In terms of sustainability development, the city of the future can valorize its municipal waste by transforming it into energy through a gasification process. The resulting biogas can be used for biogas vehicles, generating electricity with gas turbines, or producing building heat with gas furnaces. Similarly, industrial waste can be valorized through zero-emission plasma processing to produce multi-use synthetic fuel.

Conversely, hydrogen is a renewable power source that is currently under-exploited in the decarbonization of our cities. Today, it's primarily used by the industrial sector for the production of fertilizer and for refining crude oil in the production of fuels and petrochemicals. However, to achieve the city of the future, hydrogen should be considered

as a green fuel supply for transportation and for industrial energy usage, residential heating, and power generation to decarbonize our cities.

The merit of hydrogen lies in its potential to be used in various parts of the local economy as an enabler to climate change mitigation, but only if the hydrogen is produced using renewable power to obtain "green hydrogen". Today most hydrogen is produced using fossil fuel by utilizing the steam methane reforming (SMR) process. The goal is to produce hydrogen by utilizing renewable power electricity. Hydrogen can simply be produced by electrolysis—that is, decomposing water in its respective hydrogen and oxygen components using an electrolyser. The hydrogen can then be liquified or compressed at high pressure in compact tanks, in which form it can be transported by rail, road, or sea, or used directly by vehicles as fuel supply. Another cost-effective way to utilize hydrogen is to inject it into natural gas pipelines, keeping its ratio to natural gas below three-to-five per cent.



## What is the cost of hydrogen?

Green hydrogen production is expensive—about twice the price of producing hydrogen by SMR. However, in certain markets like Europe, the local fuel and electricity costs are high enough that hydrogen can compete economically. While the cost of fuel and electricity is relatively lower in Canada than in Europe, hydrogen can still play an important role in Canada's future. However, to be successful it will require the following evolution:

- Legislations and regulations that give value to green solutions such as a notion of tax credit on fossil fuel reduction, carbon cap and trade market, or increasing the cost of traditional fuels with a carbon levy;
- Enforcing standards for low emissions of greenhouse gases—nitrates, sulfurs, and particulate emissions—in the atmosphere, and;
- Advancing technology to increase performance and reduce costs by designing large-scale hydrogen production systems to be significantly cheaper.

Achieving cost-competitiveness will result in widespread availability for the masses. For the general population, this means increasing the accessibility of hydrogen at local gas stations as a source of fuel, for example, and for larger industries this could mean a fuel supply that is transported directly to site—again by rail, road, or sea.

## What are the safety implications to consider?

Hydrogen is odorless, colorless, tasteless, and non-toxic. However, the fact that it's extremely flammable is a risk that must be mitigated. Outdoors, its high volatility as it rises—and generally disperses quickly before ignition—is possible. Indoors, the use of hydrogen requires sophisticated detection equipment and increased care.

Nonetheless, for the last several decades, the industry has used hydrogen in vast quantities and developed infrastructure to produce, store, transport, and utilize hydrogen safely, while maintaining a high safety record. By comparison, natural gas is also odorless, colorless, and tasteless, and also used vastly and safely. Hydrogen energy density is lighter than natural gas,

gasoline, and diesel, and as such, it's different but not any more dangerous than traditional fuels.

The future vision for all city planning and development is one that will achieve an advanced technological performance at a lower cost. Planners, rightly so, want to realize a better economy of scale by leveraging sustainable development with zero greenhouse gas emissions. While Canada, the United States, Europe, and Australia are leading the way, interest in hydrogen as an enabler to the energy transition will only continue to grow. In this clean energy revolution, we must continue to reduce our dependence on fossil fuels. Green hydrogen is the unlikely, yet, right contender to help us achieve that goal. 🍁



**Michel Carreau** is the global director of hybrid power and microgrids at Hatch.

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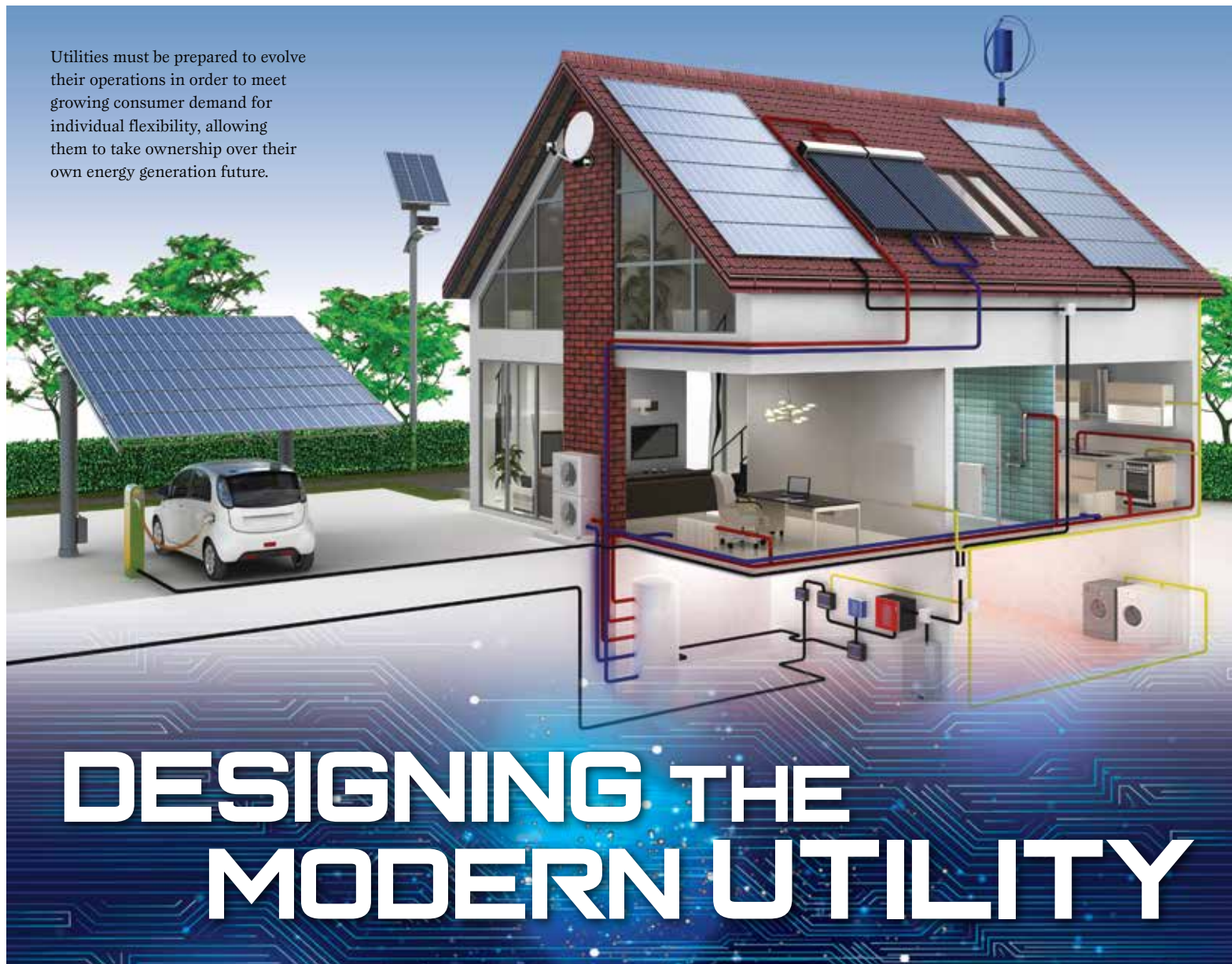
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# DESIGNING THE MODERN UTILITY

Adapting to the changing demands for power consumption. *By Brian Bell*

Today's utility has many challenges, one of which is keeping up with rapidly evolving customer expectations. It's easy to become complacent when customers have no choice but to use the electricity you provide. Traditionally, customers are assigned an electricity distributor based on where they live, they receive their monthly bill, pay it, and would never think to look for alternatives. But innovations and changes in consumer attitude have created a new kind of utility customer with different goals and expectations. Customers are taking a more active approach to electricity. These "prosumers"—as they are dubbed in the industry—don't just want to consume electricity, they are now interested in producing it themselves. And as regulators and policy-makers adjust, new competitors are entering the retail energy market on a regular basis, giving utilities a run for their money. This unprecedented degree of customer choice requires a new set of practices and investment into new

technology to make sure that utilities make decisions that are smarter, help lower costs and improve the performance of the network as a whole.

## Customers are taking charge

Solar power is a small but rapidly growing source of electricity for Canadians. According to the National Energy Board, in 2015, Canada had over 2,100 megawatts

There are environmental and financial considerations to this. As it relates to utilities, solar power retailers have emerged, offering various net metering options to homeowners with solar projects. This allows households to sell excess electricity back to the power grid. This arrangement is great for retail energy but not necessarily for utilities with a traditional operating mindset. Not only is this a missed

To address tomorrow's challenges, utilities will need a more comprehensive network model.

(MW) of installed solar capacity, generating 3 terawatts annually. While this represents only about 0.5 per cent of national electricity generation, solar projects have been developing rapidly, with close to 2,000 MW of capacity added since 2013.

opportunity, it puts new types of pressure on the grid. The growth in solar energy adoption cannot be ignored.

Another development that electric utilities cannot ignore is electric vehicles. Even though some say mass adoption is many years or even decades away, utilities



must plan ahead and consider what this will do to existing electrical infrastructure. More electric vehicles mean more charging stations. Can our current power grids handle a five or 10 per cent increase in the number of electric vehicles on the road? What if these came from the same neighbourhood, plugging in at the same time of day? A solution such as Esri's Utility Network program uses demographic and sociographic information along with an asset model to predict if and where there are likely to be clusters of electric vehicle buyers so a utility can replace aging equipment with larger transformers in that area before the increase in power consumption becomes an issue.

### Power from the inside

From a financial perspective, a utility will incur more costs if it underestimates the size of its transformers, they burn out earlier than planned, and must be replaced or repaired sooner. If these vulnerabilities are identified early enough, they can plan ahead and budget, accordingly, optimizing their asset management plans to account for these challenges.

From an operations perspective,

information accessibility is key to designing and maintaining a modern utility network. All staff, including those out in the field should be able to access information about the network without requiring assistance from the GIS department. If there is a broken water main at 3 am, the field worker should be able to look up which valve to turn off by accessing the network remotely on their device. Rolling out a paper map on the hood of a truck in a rainstorm just doesn't cut it in today's always-connected world.

### Transforming for tomorrow

Digital twins are becoming quite popular and utilities have the most to gain from this technology. A digital twin is a virtual model of a network that utilities can use to obtain real-time and predictive insight. The platform can live in the cloud, reducing costs associated with setup and maintenance. Together with a solution such as Esri's Utility Network, utilities can get a complete picture of current systems and processes and identify potential gaps between what they believe they need to plan for versus what is actually required to get ahead in an increasingly complicated world.

With the progression towards smarter networks with more complex equipment and more resiliency, traditional network management tools cannot keep up. To address tomorrow's challenges, utilities will need a more comprehensive network model. They must provide pervasive access to anyone in the organization, especially field workers. Lastly, they must remain vigilant to changing customer expectations and work to maintain and improve customer relationships.

It's impossible to be prepared for every possible scenario but investing in new technology and adopting a forward-thinking attitude will help utilities remain at the forefront of innovation within an evolving landscape. Being able to meet the demands of the next generation of customers and staying relevant is essential to this. 🍁



**Brian Bell is the director of the utilities sector at Esri Canada.**

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A rendering of the recent mixed-use Thorndike Exchange redevelopment project in Lowell, MA with a new pedestrian bridge connecting the development directly to the Lowell commuter rail station in the background.

Credit: Obe 3 Studio

# THE TRIPLE BOTTOM LINE

Appreciating all of the benefits of transit-oriented development.

By Dan Hodge and Steph Larocque

Researchers and practitioners have long understood the importance of transportation in economic development and housing location choices. For example, early advancements of the subway, streetcar, and commuter rail systems in New York and other major U.S. cities were often led by developers who knew that providing high-frequency rail transit lines would drive the demand for housing and business uses on their land.

While this linkage remains strong today, with easy-to-cite examples of transit-oriented development (TOD) in cities from Boston to Seattle, a much less-studied but equally important topic is the economic sustainability impacts of integrated transportation and land use. As noted by the Brookings Institution, effective plans to address climate change often do “not address a major underlying cause of environmental harm—decades of poor urban land use decisions. Specifically, better urban land use would reduce greenhouse gas emissions (GHGs) from cars and limit the human and financial costs caused by developing environmentally risky land.”

The majority of air pollution and greenhouse gases (GHG) is generated by transportation and buildings, so finding ways to reduce the number and distance of car trips and lower the energy consumption per household would go a long way to combating climate change. At the same time, more closely integrated transportation and land use development can have broader triple bottom line benefits such as increasing the property tax revenue per acre of land, improving the accessibility of workers to

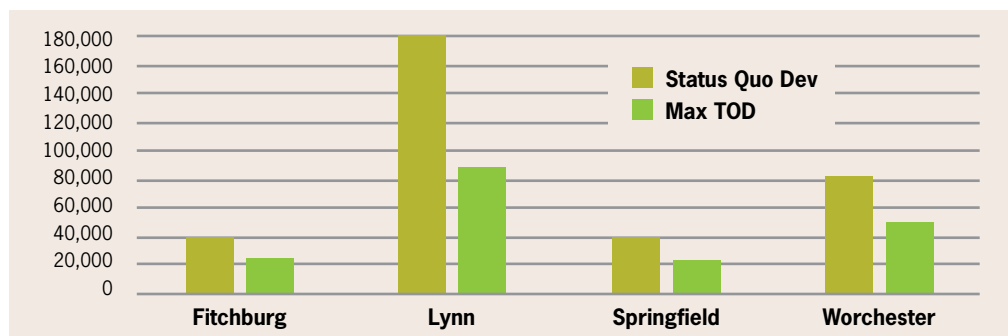
jobs, and increasing the amount of active transportation (biking and pedestrian trips) which improves health.

The costs of development sprawl (characterized by larger average parcel sizes for housing and longer distance commutes) have been studied and quantified for decades to demonstrate the inefficiency and fiscal cost implications of that kind of land use. More recently, books by renowned urban economists like Edward Glaeser and Richard Florida have highlighted the lower energy consumption and reduced GHG impacts of cities compared to suburban and exurban areas. Florida notes that “Suburban sprawl is extremely costly to the economy broadly. Infrastructure and vital local services—such

as water and energy—can be 2.5 times more expensive to deliver in the suburbs than in compact urban centers.”

The alternative to sprawl goes by different names with “smart growth” a common term to describe denser land use patterns, smaller average parcel size, mixed uses and walkable places, and development concentrated near transportation nodes. A major study in 2013 on the fiscal benefits of smart growth development found that “Whether by saving money on upfront infrastructure; reducing the cost of ongoing services like fire, police and ambulance; or by generating greater tax revenues in years to come, community after community has found that smart growth development would benefit their overall financial health.”

**Metric Tons of Annual Passenger Vehicle GHG Emissions  
Optimal TOD vs. Business as Usual**



**Summary of Cost-Benefit Analysis Results**

IMPACT	NPV		
	Low (5%)	Expected (50%)	High (95%)
<b>Financial Costs (Capital and Operating)</b>	\$(68,225,000)	<b>\$(47,685,000)</b>	\$(32,114,000)
<b>Benefits</b>	\$119,317,000	<b>\$117,010,000</b>	\$121,401,000
<b>Total NPV</b>	\$51,092,000	<b>\$69,325,000</b>	\$89,288,000
<b>BCR</b>	<b>1.75</b>	<b>2.45</b>	<b>3.78</b>



To maximize the social and environmental benefits of smart growth requires an emphasis on dense mixed-use development concentrated around rail transit stations—also known as transit-oriented development (TOD).

### Measuring and monetizing the triple bottom line benefits of TOD

Based on the foundation of research referenced above as well as the rapidly growing body of environmental, transportation and social economics research and models, it is now possible to quantify and monetize a comprehensive series of triple bottom line impacts related to TOD. Doing so requires at least three core elements:

**1 Clear definition of the transportation, land use and development alternatives to be compared:** For example, this could be a TOD-focused scenario with enhanced transit versus a more spread out “business as usual” development pattern emphasizing car trips.

**2 An analytical framework of triple bottom line impacts (costs and benefits):** Stakeholders must be able to understand and agree on the set of impacts to be measured

related to energy consumption, vehicle miles of travel (VMT), air pollution, lifecycle costs, social benefits of transit and active transportation, etc.

**3 Industry standard methods and models to measure and monetize impacts:** For example, forecasting how the number of auto and transit trips varies by scenario is complex but there are methods to estimate these transportation impacts, which can be converted into monetized impacts for air pollution, GHG, congestion relief, safety, and low-income mobility options.

### Sustainable redevelopment of Ford Twin Cities Assembly Plant in St. Paul, MN.

Impact Infrastructure (the makers of Autocase software) worked with the City of St. Paul to evaluate the triple bottom line benefits and costs of transportation alternatives to sustainably redevelop a 135-acre former Ford assembly plant into a mixed-use project. The City started with a fairly standard, more auto-based transportation scheme as the base case, and then compared that to a scenario with:

- Enhanced transit service frequency and bike infrastructure;
- Increased intersection density for pedestrians;
- Managed parking through shared parking and fees; and
- Provision of a free employee transit program and transportation demand management strategies.

This project applied a comprehensive triple bottom line cost-benefit analysis (TBL-CBA) to find that transit and active transportation can reduce congestion, pollution, noise, and carbon emissions. It can also provide low-income families with access to more jobs, health care, and food options. A better public realm and healthier, safer transportation can improve the quality of life.

The high sustainability alternative was estimated to generate between \$50 million and \$90 million in net benefits—a strong benefit-cost ratio of 1.7 to 3.8—relative to the base case. The benefits were largely driven by how the design case would boost transit ridership





and increase the number of trips using active transportation (biking and walking), with Impact Infrastructure applying proven models to capture the economic, environmental, and social benefits that stem from those investments.

### Potential of TOD in Massachusetts gateway cities

A project led by MassINC (managed by co-author Dan Hodge) evaluated the potential for TOD in Massachusetts' Gateway Cities—small to mid-sized economically distressed cities outside Boston.<sup>5</sup> This research initiative builds on state policies to spur transformative development in these regional urban centers by better understanding how commuter rail and transit improvements—coupled with economic development incentives to support urban infill projects—can lead to successful TOD.

The study found that funneling future development into transit-connected Gateway Cities would reduce road congestion and greenhouse gas emissions, increase housing, conserve open space, and improve quality of life in communities throughout the Commonwealth. At optimal TOD buildout, Gateway City TOD areas could

house approximately 230,000 jobs and 230,000 residents. Future development with mixed use concentrated around existing rail transit stations is estimated to generate significantly less auto VMT, reduce energy demand for heating, and lower air emissions compared to status quo development trends.

Across the 13 Gateway Cities, optimal TOD within a half-mile radius of train stations has the potential to reduce vehicle commute trips by 16 percent and non-commute trips by 24 percent along with shorter average distances traveled. The result is a 40 percent drop in GHG emissions in TOD areas—a reduction of roughly 800,000 metric tons annually. Meanwhile, studies show the travel impacts of TOD account for about 60 percent of the total GHG reduction from compact development<sup>6</sup> as the home energy benefits associated with households occupying smaller residential units in multi-family buildings with shared walls represent approximately 40 percent of TOD's GHG impact. Estimating a total combined reduction of 1.3 million metric tons, optimal Gateway City TOD has the potential to offset \$105 million in GHG emissions annually.

### Applying TBL-CBA to TOD: a strong ROI

As shown in these two case studies, triple bottom line cost-benefit analysis (TBL-CBA) is now capable of measuring and demonstrating the full range of economic sustainability benefits of TOD, including climate change mitigation. Similar to how TOD plans regularly employ market studies and land use analysis, they should also consider how TOD can result in fiscal cost savings, travel and health gains, and environmental benefits. Applying TBL-CBA to justify and optimize smarter TOD planning and implementation is a smart investment to make in advance of much larger investments in transportation infrastructure and private development.

This piece was originally published in the May 2019 of the APWA Reporter, the publication of the American Public Works Association. 🍁

**Dan Hodge is the principal economist at Autocase.**

**Steph Larocque is the chief operating officer at Autocase**



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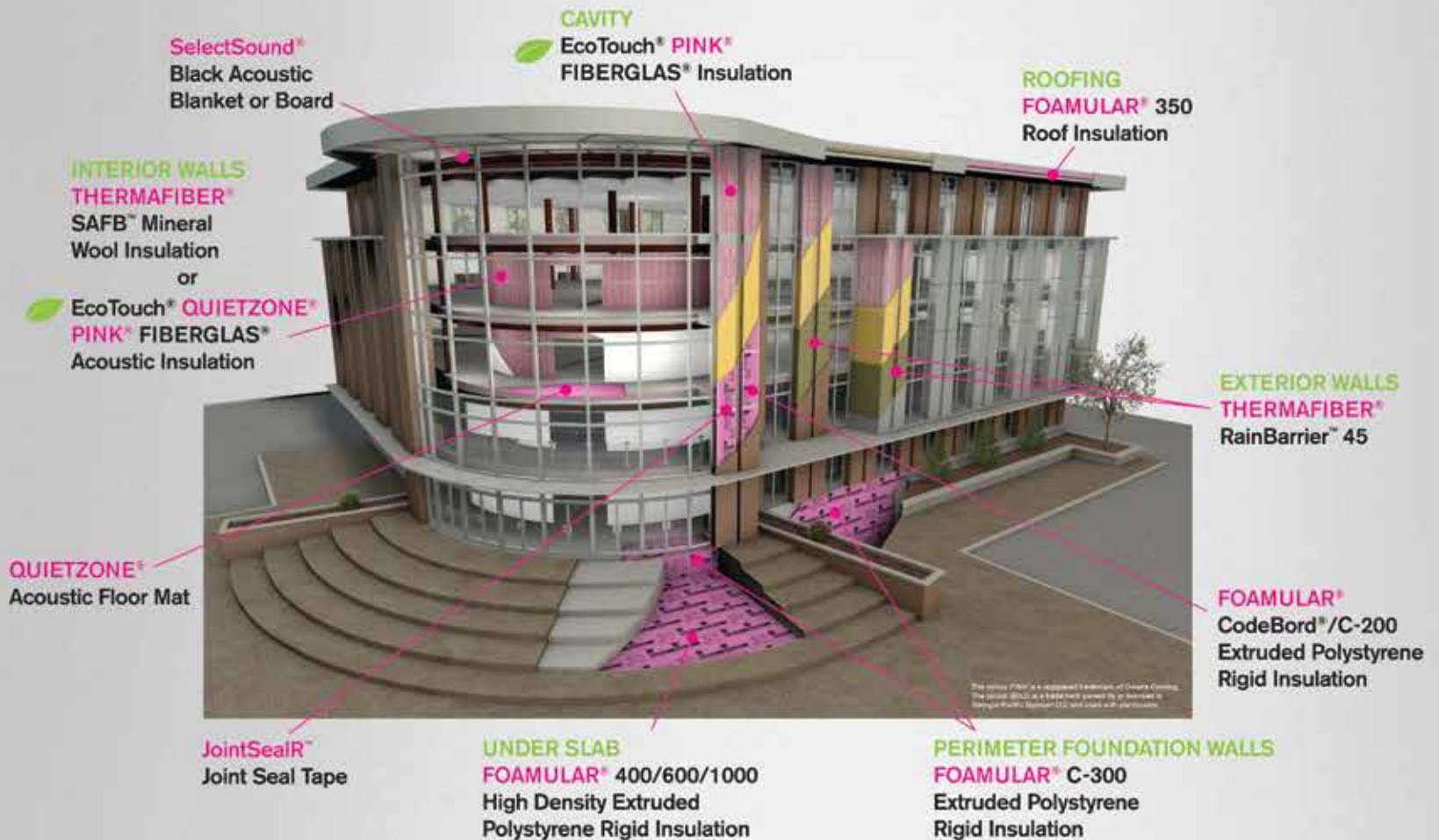
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# PARK THE OLD APPROACH

Flooding is not the only reason for updating parking standards.

By Andy Manahan and Paul De Berardis

Many will recall a dramatic rescue of two men by police in west-end Toronto after they were trapped in a flooded, below-ground parking elevator during a severe rainstorm in August 2018. While these kinds of life-and-death situations are rare, we are experiencing more floods in Canadian cities which can turn standard underground parking in high-rise buildings into potential swimming pools of excess stormwater.

When construction projects involve below-grade parking in areas with strained sewer capacity, it is a recipe for disaster. In parts of Toronto where there is aging underground infrastructure and antiquated combined sewers, it was recognized by Toronto Water that something had to be done to reduce sewage and stormwater from entering Lake Ontario.

It was for this reason that RCCAO commissioned a report by the Ryerson Urban Analytics Institute, “How Parking Regulations Need to Evolve for High-Rise Buildings.” Even though the impetus for the study had to do with how the city could continue to grow in the face of these infrastructure constraints, Ryerson’s research team highlighted that advances in transportation technology are transforming the way we travel.

More people are using apps on their smartphones to hail rides from services such as Uber and Lyft or use car-sharing programs, which reduces parking requirements for owned vehicles, particularly in the

downtown. In the future, the rise of shared automated vehicles will mean even fewer cars will be parking for lengthy periods of time and parking space sizes will shrink.

Meanwhile, multilevel, below-grade structures are costing between \$50,000 and \$100,000 per space to build. This is an additional cost that many first-home buyers are unwilling to bear, and this has a direct impact on affordability in the country’s more expensive housing markets such as Vancouver and Toronto. Further, it is an unnecessary expense particularly when many people, including empty nesters, do not aspire to car ownership when there are so many mobility options in cities.

expensive and quicker to construct but, more importantly, the space can be repurposed later if it becomes redundant, meaning there is a longer-term value proposition.

The report provides examples of repurposed parking garages to make the case. The Summit is a 426,000 sq. ft. hotel in Cincinnati, Ohio that was once a parking garage but now features 239 rooms, an art gallery, rooftop terrace, ballroom and 19 meeting spaces. Peckham Levels is a community hub and art space located in a refurbished parking garage in London, England. It is a seven-storey structure which includes 50 studio spaces, restaurants, children’s play areas, a 3D printing lab and a yoga studio.

Future parking requirements must consider a range of factors such as stormwater management, new mobility and housing affordability.

Focusing on Toronto, Ryerson found that Canada’s largest city has not meaningfully updated its parking standards since 1986 and has not addressed the consequences of maintaining strict minimum parking standards when demand for space is declining. Led by Professor Murtaza Haider, the study also recommends building above-grade parking in high-rise residential buildings instead of underground parking. Above-grade parking is not only less

Calgary’s new 9th Avenue Parkade (9AP) is a great example of a new, multi-use, above-grade structure which can be converted to other uses because it has a non-standard floorplate, with increased floor-to-ceiling heights. Further, 9AP’s design does not require external ramps and allows for the parkade to be converted to residential or commercial space in the future.

On the other side of the globe, Moreland City Council, a suburb of Melbourne,





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Australia will eliminate minimum parking requirements by 2021. This spring, Moreland adopted an integrated transport strategy which supports a shift toward walking, cycling and transit use, with a resolution designed to ensure that residents of new developments in certain neighbourhoods carefully consider their car ownership needs.

The City of Toronto deserves credit for showing flexibility on parking ratios for new projects such as those near subway stations. In addition, car-share parking spaces have been permitted to reduce the minimum resident parking requirements. We have heard however, that once the developer turns the building over to the condo corporation, there are safety concerns expressed by residents about having outsiders use the building's parking spaces.

Unfortunately, Toronto's Tall Building Design Guidelines state a preference for below-grade parking, and that is turning out to be a critical factor in addressing stormwater capacity concerns. If the municipal system has insufficient capacity to handle a peak load, then no connection to the sewer will be granted.

Lou Di Gironimo, general manager of

Toronto Water, identified at a recent public workshop how sewer capacity constraints in the form of private water discharge permits and/or long-term agreements for groundwater impacted seven high-rise building projects. If underground parking had not been required for these two commercial and five residential projects, the equivalent of nearly 20,000 additional suites could have been built. This represents a classic trade-off between the city's current requirements for the provision of underground parking spaces and the city's intensification objectives.

Future parking requirements must consider a range of factors such as stormwater management, new mobility and housing affordability. Punching more holes into the ground, has a cumulative effect on hydrology. A good solution would be to upgrade the city's aging infrastructure, but we can't wait a decade for this to happen. A practical alternative in the short-term, as presented in the report, is to build future parking above-ground as this would curtail groundwater from dry weather sanitary flows and take pressure off when there are storm events.

We must be forward thinking in the way we plan new parking in urban centres across

Canada. The consequences of building too much underground parking are profound. These include overloading our stormwater and sewer systems, increasing construction costs and overbuilding for declining parking demand. Even the environmental costs of transporting and disposing of excess soil generated through the process of building below-grade parking can be significantly reduced by reforming parking standards.

Let's embrace flexibility and plan properly for the future of parking in Canadian cities. Let's change policy for minimum parking standards so that the generations that follow us can effectively use or repurpose what we planned decades before. 🍁



**Andy Manahan is the executive director of the Residential and Civil Construction Alliance of Ontario (RCCAO).**

**Paul De Berardis is the director of building science & innovation for the RCCAO.**

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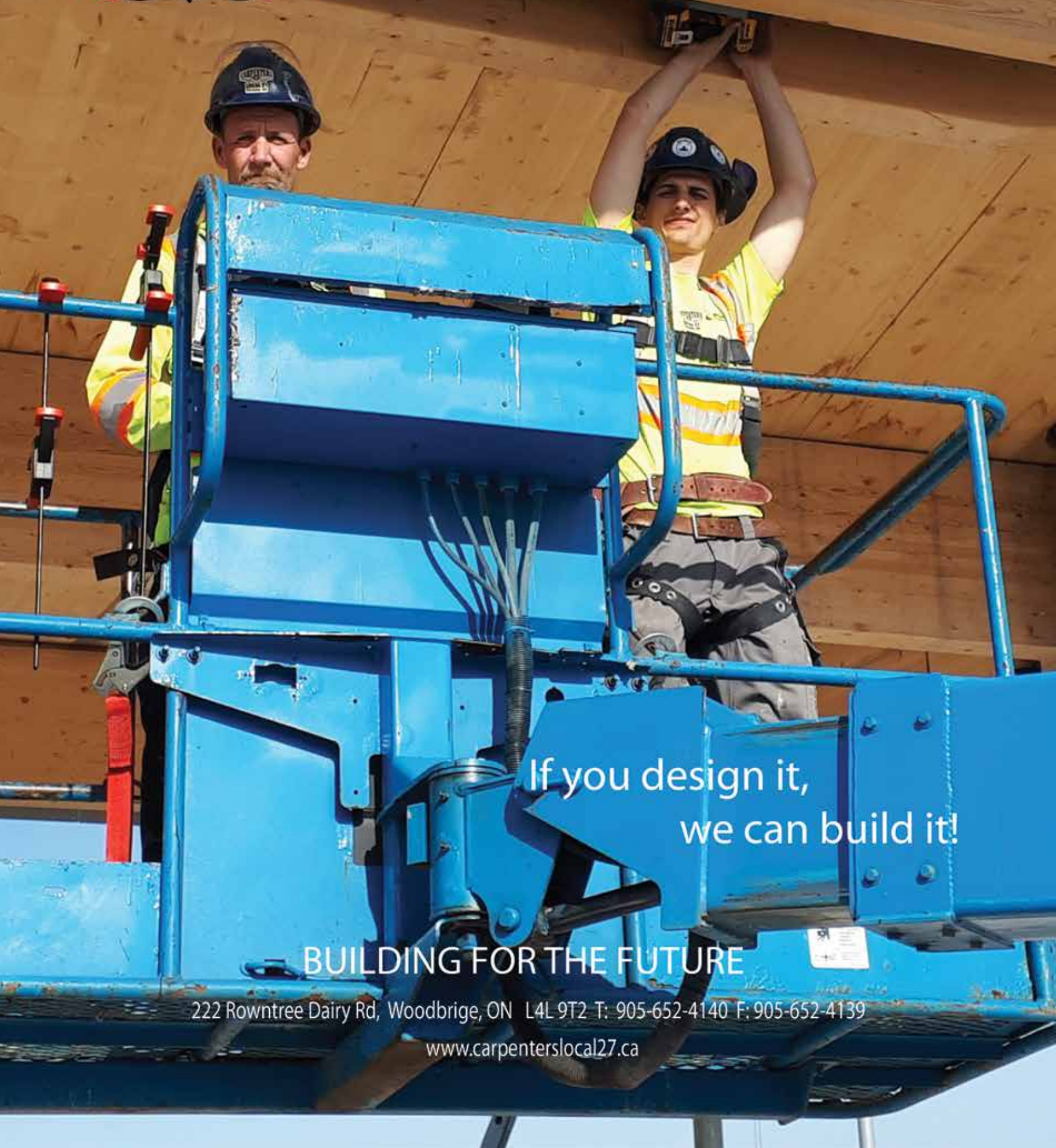
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## Considerations toward effective risk management of P3s. *By Charles Wheeler*

**T**he delivery of P3 infrastructure projects can be negatively impacted if risks are inappropriately assigned or undermanaged throughout the lifecycle of a project. Truly effective project risk management requires a strategy that can also accommodate the uncertainty and variety of risks projects can be exposed to from the cradle to grave of a project, regardless of size.

Given this, it is never too early to start talking about, analyzing and mitigating project risks as they inform the most important discussions on large and complex infrastructure projects, regardless of the type of procurement. The lack of management attention to cost, budget, schedule, and scope risks is the Achilles heel of project management.

In fact, risk conversations should happen as often as possible and in as many planning streams as possible to ensure the sponsor is soliciting and receiving broad input from all stakeholders to inform the project's risk register. For example, potential risks (and thoughts on how to best profile and mitigate them) can be identified through public consultation and engagement efforts, deliberations with senior executives and/or elected leaders, and as part of market soundings. Doing so allows sponsors to get a broader perspective and clarity on the

project's risks as well as evolving market trends on risk tolerance as they relate to the project's desired outcomes. Limiting the development of risk registry to only inputs from the project team is not a recipe for project success.

Every project is unique, and the goal of every sponsor is to design a procurement with strong risk protection and a risk regime that results in best value for taxpayers. This is achieved when risks are assigned to the party best positioned to manage, understand and accurately quantify them. When it comes to the task of assigning appropriate risks to respective parties, there is often good alignment between sponsor and contractor as it is in the interest of both to keep the project on budget and on schedule.

Further, opportunity and risk must be assessed together—so it is important to focus on both project risks and opportunities, as opportunities such as the potential for fast-tracking projects can often becoming a means to mitigate potential risks. All too often, project sponsors tend to focus on risk and tend to spend very little time assessing opportunities. Every opportunity not assessed is a potential threat to a project down the road. The use of incentives to encourage contractors to accept the risks

the sponsor does not wish to retain can be a powerful tool during the procurement phase to achieve project objectives. For example, pricing options can be used to incent contractors to move from a shared-risk approach to taking on full risk in circumstances where it makes financial or strategic sense.

Just as the scope, performance and project outcomes need to be well-defined, risks too need to be clearly identified with clear and concise contractual obligations in place to address responsibilities with respect to scheduling and completion dates, financial payments, force majeure (unforeseeable and/or uncontrollable circumstances that could impact cost and schedule), project milestones, and operations and maintenance. This means sponsors need to develop and track responsibilities for managing and mitigating all risks and opportunities, regardless of ownership, and monitor them based on an analysis of both qualitative and quantitative risks—the whole time keeping in mind that risk management is an ongoing process, not a static one, with strategies, plans and dedicated resources in place from project initiation right through to close-out.

The vast majority of risks/claims on infrastructures projects tend to occur in the



following eight areas: utility relocation and coordination; geotechnical risks; contamination; permits and approvals; bundled projects; scope changes; property related issues; and construction interfaces with other contractors. The following discusses recent approaches that have been taken to develop risk profiles in the first two areas listed above: utility conflict and relocation and coordination and geotechnical risks.

It is not only important to discuss potential risks broadly and early on in the project, but it is also important to launch early investigation works to inform the development of a project's risk profile. Robust geotechnical investigations and subsurface utility engineering (SUE) are two critical tools to help determine whether risks can be efficiently retained, transferred or are better addressed through early works programs that can de-risk certain project elements prior to contract award.

P3 procurement models are evolving, and it is becoming increasingly obvious that the contractors bidding on these large and complicated projects cannot efficiently take on the full scope of risks related to utilities. Another tool that is being more commonly used to create a more effective risk regime for utilities is a Utility Baseline Report (UBR). As contractors are dependent on third-party utility providers to self-perform utilities work (including provincially/federally regulated private utilities) to clear utility conflicts, they are (understandably) not prepared to fully accept an unlimited schedule risk of this nature. Therefore, it is becoming common practice to institute a UBR process, which transfers some of this schedule risk to the project sponsor.

In specific terms, a UBR process includes listing all utility projects that support the project and providing the upset durations typically required to have these projects completed. If these timelines are exceeded such that they materially impact the contractor's schedule, then the contractor may be entitled to schedule relief and compensation (on a cost-sharing basis depending on the duration of the delay). In addition, UBR's typically include an mislocated/unknown utilities regime to address schedule and risk costs that contractors may otherwise estimate and carry within their respective bids. Conflicts with existing mislocated and unknown utilities can have a significant bearing on projects, particularly in urban settings. Often, it is not the actual cost for protecting and/or relocating the impacted utility, but rather the delay for executing the unanticipated work, that can have the greatest financial impact. With the contractors not entirely



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Some of the key project risks in P3 developments can be identified during the public consultation phase, which also allows the project owner to appreciate the risk tolerance of the affected stakeholders.

be entitled to compensation as per the terms of the contract.

In fact, when addressing risk, sponsors should let the principles of appropriateness and reasonableness guide the way. And while fully transferring risks to the contractor through RFP incentives can work, it is not a panacea for risks the sponsor does not wish to retain.

With contractors becoming increasingly skittish about taking on more risk, new appropriate and reasonable risk-sharing approaches will need to be established, as many high-profile cost and schedule risks borne by contractors in the past may not be tolerable or cost-efficient to transfer as the market continues to evolve. And establishing these new approaches will require starting many and multiple open, transparent and frank conversations about risk from the project's outset. ♣

in control of these variables, they perceive this as a significant risk exposure that would otherwise come with considerable additional project costs in the form of risk pricing. With schedule relief and potential compensation on a cost-sharing basis informed by a UBR, these risks can be priced in a more accurate and efficient manner.

For geotechnical risk, it is possible for sponsors to successfully transfer all geotechnical risk to contractors provided the geotechnical investigations are completed in accordance with industry best practices. These investigations are not only necessary

to guide preliminary designs, they also help reduce project risks tied to contingency budgets for unknown or unforeseeable subsurface and groundwater conditions. But even with more robust and standardized data, one size does not fit all, and in some cases, optionality can be structured in bids whereby potential contractors can bid and receive procurement incentives in the open market period to take on full geotechnical risk. Whether the risk is fully or partially transferred to proponents, if there is an error in the geotechnical data reports that can be validated, the contractor may be still



**Charles Wheeler is the vice-president of transit for Comtech Group.**



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**Blue Line Extension**  
**2019 Top100 Projects Rank: #15**  
**Value: \$3.9 billion**

## Canada investing \$1.3 billion in Blue Line Extension

The Government of Canada has announced a federal investment of more than \$1.3 billion to extend the Montréal Metro's Blue Line.

"I am proud to announce our major contribution to the extension of the Montréal Metro's Blue line. The five new stations will simplify travel for the city's east end residents and the people who work there, so they spend less time in traffic and more time with their loved ones," said François-Philippe Champagne, Minister of

Infrastructure and Communities.

Once completed, the extension project will add 5.8-kilometres of new track and five new stations, connecting the current Saint-Michel station to Anjou. This funding will also support the construction of two bus terminals and a new park-and-ride.

The contribution represents one-third of the expected over cost of the project, currently pegged at \$3.9 billion. The funding is in addition to a contribution of \$16 million, which was announced in April

of 2018 to support the development of the business case for the project.

"The Government of Quebec is committed to accelerating the project to extend the Blue line to Anjou and is making the necessary efforts to make it happen. This project is key to improving mobility in the metropolitan area and stimulating development in Montréal's east end. After a 30-year wait, the development of the Montréal Metro is getting a reboot, and this is just the start," said Chantal Rouleau, Quebec Minister for Transport.



**Corner Brook Acute Care Hospital**  
**2019 Top100 Projects Rank: #78**  
**Value: \$750 million**

## Contract awarded for Corner Brook Acute Care Hospital

Premier of Newfoundland and Labrador Dwight Ball has announced that the Corner Brook Health Partnership has been selected to design, build, finance, and maintain a new acute care hospital in Corner Brook with an estimated contract value of \$750 million.

"It's great to join my colleagues today to celebrate this huge step forward on the new hospital. Once open, acute care services will be offered in a modern hospital – one of the most efficient hospitals in Canada," said Minister of Health and Community Services John Haggie. "Thank you to the staff of Western Health who worked tirelessly to bring us to this point."

Corner Brook Health Partnership consists of:

- Plenary Group Ltd.;
- PCL Constructors Canada Inc.;

- Marco Services Ltd; and
- Johnson Controls Canada.

The seven-storey, 600,000 square foot facility will be connected to the 145-bed long-term care home currently under construction. The hospital will have 164 beds with the same services currently provided at Western Memorial Regional Hospital, as well as an expanded cancer care program including radiation services.

Construction of the hospital will start later this summer and is anticipated to be completed in 2023. The design of the hospital can be viewed online at [youtu.be/FRv5AHMny9o](https://youtu.be/FRv5AHMny9o)

Corner Brook Health Partnership will also:

- Host a job fair for skilled labourers looking to work on the construction;

- Develop an apprenticeship training program for local apprentices; and
- Develop a plan to assist with hiring tradeswomen to work on the construction site.

Over the course of construction, an estimated 4,000 person years of employment and \$460 million in GDP is expected to be created.

The announcement marks the conclusion of a 17-month procurement process, which began in January 2018 when the Department of Transportation and Works invited companies interested in the project to submit qualifications. In April of this year, two teams submitted project proposals that were evaluated leading to this announcement.



## APPOINTED



Paul  
Kefalas

The Government of Canada has announced the reappointment of **Paul T. Kefalas** as chairman of the Jacques Cartier and Champlain Bridges Incorporated (JCCBI) Board of Directors for a period of one year.

Kefalas is a businessman and career executive with over 30 years of experience. He has held senior executive positions in several Canadian and international companies that excel in global production operations, power technology and infrastructure projects.

Since 2008, he has been chairman of the JCCBI Board of Directors where he has overseen activities surrounding the completion of projects, such as the reinforcement of the structure of the old Champlain Bridge and major work to reinforce and stabilize the approaches of the Jacques Cartier Bridge. He also served on the board of directors of the Société des alcools du Québec (SAQ) from 2000 to 2002, and was a member of the Chancellor's Associates of Concordia University from 1998 to 2002.



Raymond  
Cole

Two well-respected individuals in the Canadian public sector infrastructure space have been named among 83 new recipients of the Order of Canada.

Dr. **Raymond Cole** is a professor emeritus at the University of British Columbia, having served a successful 40-year career at the institution. He spent his career in architectural research and education, teaching courses

in such fields as environmental performance, regenerative design and environmental issues. He was recognized as a UBC Distinguished University Scholar in 2003.

One of the co-founders of Toronto's Diamond Schmitt Architects, **Donald Schmitt** is a recognized leader in the architectural community at home and abroad and is known as a champion of sustainable environments and design excellence.

Schmitt's portfolio includes many iconic buildings across Canada. Among recent projects are the high-rise laboratories of The Peter Gilgan Centre for Research and Learning at Sickkids in Toronto; the new campus of Emily Carr University of Art + Design in Vancouver; and the highly-collaborative academic environment of Lazaridis Hall at Wilfrid Laurier University in Waterloo, Ontario.



Joseph  
Kirk

**Joseph Kirk** has been named president of construction management firm Govan Brown, overseeing the company's operations across Canada.

Based in Govan Brown's Toronto headquarters, Kirk has nearly 20 years of experience in operational optimization, customer relationship management, business development and change management strategies. He has spent the last five years helping drive Govan Brown's corporate strategy, client relationships, business development, and strategic growth.

"Joe is a trusted leader and creative thinker who has consistently helped Govan Brown evolve and expand our business," says **John Brown**, Govan Brown Group co-chairman. "He is integral to the culture we have here at Govan Brown and will undoubtedly continue to inspire our team and our clients with his signature pragmatism and leadership."



Steven  
Hobbs

Metrolinx has announced **Steven Hobbs** as the new director of policy and strategy.

For the past five years, Hobbs led strategic planning, stakeholder outreach, research, and policy development as vice president of strategy and stakeholder relations at the Canadian Council for Public-Private Partnerships. Working with senior leadership in government and the private sector, he worked to enable smarter, more innovative infrastructure development, procurement, and delivery at all levels of government in Canada.

He also has more than six years of government policy experience in issues of indigenous affairs, northern development, transportation, and infrastructure. He served as chief of staff to two Ministers of Aboriginal Affairs and Northern Development in Ottawa, providing strategic policy, communications, and parliamentary advice. He also spent time working for the Minister of Transportation, Infrastructure, and Communities as a policy advisor during the wind up of stimulus spending in response to the global recession.

Hobbs holds a Master's degree in Political Science from the University of Calgary and a Bachelor of Arts degrees in Political Science and Economics from Lakehead University. He also sits on the executive committee for Young Leaders in Infrastructure.



Doug  
McNeil

**Doug McNeil** has been named Ontario's special advisor on flooding by the Government of Ontario.

The special advisor will assess current roles and responsibilities of governments, agencies, and organizations involved in flood management, including any opportunities for improvement. He will also review the feedback received, identify focused recommendations, and ensure all recommendations are consistent with the province's ability to implement them.

McNeil has 36 years in public service with the City of Winnipeg and the Province of Manitoba. He is a former deputy minister of infrastructure and transportation, vice president of engineering and construction, and vice-president of hydraulics with the Manitoba Floodway Authority. McNeil recently retired as chief administrative officer of the City of Winnipeg.

He played key roles in the 1997 "Flood of the Century" on the Red River and led the Floodway Expansion project, which included a provincial review of floodway operating rules and flood protection studies of mitigation measures for Winnipeg.

The Canadian Institute of Planners welcomed three new members to its board of directors.

**Jenna Schroeder** is the director of regional planning for community planning – Regina in the Ministry of Government Relations at the Government of Saskatchewan. She is a past president of the Saskatchewan Professional Planners Institute.

**Dan Huang** is a senior community consultant and principal at Urban Systems Ltd. in Victoria, British Columbia. He served as president of the Planning Institute of British Columbia from 2015 to 2017.

**Ann Joyner** is a project manager and senior advisor at Dillon Consulting Limited. She also serves as the chair of the Professional regulation Strategy Committee for the Ontario Professional Planners Institute.



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[andrew@actualmedia.ca](mailto:andrew@actualmedia.ca)



Photos: ReNew Canada



Matti Siemiatycki from the University of Toronto.



The panel discusses its ideas for improving transit in the Toronto region.



Ryerson City Building Institute Executive Director Cherise Burda.

## HACKING SURFACE TRANSIT TORONTO, ONT.

**With billions of dollars** in transit projects on hold due to a lack of funding and/or political consensus, the City of Toronto faces an uphill battle to build a transit system that can meet the needs of the growing metropolis. There are measures that can be taken now, but how do you prioritize the projects in order to improve the efficiency, ridership, and customer experience.

Hosted by the Ryerson City Building Institute, Hacking Surface Transit brought together a panel of experts to discuss how to do transit more effectively throughout Toronto and its surrounding communities. Each of the four panelists was given an opportunity to present their own thoughts

on the issue, which was then followed by a discussion amongst the four of them as well as questions from the audience.

As each made their case, exploring solutions for improving existing routes and creating new in the years to come, one work continuously emerged from the conversation: proof. Proof is what should drive decision-making on transit moving forward, rather than the political whim of a government who could find themselves in office for four years or less.

From **Barbara Gray's** perspective, proof based on data is what allowed the City of Toronto to show the success of its most recent significant transit experiment, the King Street Pilot.

And it is proof that should determine where the next such pilot takes place, rather than an arbitrary preference from a government body. In fact, a data-driven policy, one developed by the municipality, would solve the issue. It would allow for a system where, once a certain set of parameters in met, the complete streets treatment used on King Street would be automatically triggered for our streets in the city.

By removing the politics from the equation, instead relying on a data-driven process for transit decisions, politicians, and the transit riders, can appreciate that facts have driven new investments in the system.

Photos: ReNew Canada



Carcross/Tagish Management Corp. CEO Nelson Lepine delivers the keynote address.



Past HUB awards winners pose with the winners of the 2019 awards.

## CBN ANNUAL CONFERENCE TORONTO, ONT.

**Brownfield industry stakeholders** from across Canada gathered at Ryerson University's Ted Rogers School of Management for the Canadian Brownfields Network's annual conference, focused on revitalizing brownfields and how that work enriches communities.

With Budget 2020 confirming a five-year, \$1.16-billion investment for Phase 4 of the Federal Contaminated Sites Action Plan, there is a clear commitment to brownfield remediation work in the years to come at the federal level. That funding will be

spread to sites across the country, however it was noted during the conference that there is a concentration of sites in British Columbia, Ontario, and Quebec. Also, it was importantly noted that funding support is likely to be strong for projects in the north, as many of those projects pose both the highest risk and the highest cost.

How the business of brownfield remediation will be conducted is currently under the microscope in several provinces:

- In B.C., a review of its excess soils regulations are underway;

- In Ontario, the provincial government is working through feedback on proposed changes to the Record of Site Condition Regulation for Brownfields as well as the excess soil regulatory proposal; and
- In Nova Scotia, a full review of the Contaminated Sites Regulation is underway, now that five years has passed since the regulation was first introduced.

For more information on the Canadian Brownfields Network, visit [canadianbrownfieldsnetwork.ca](http://canadianbrownfieldsnetwork.ca).



# WHERE IT ALL BEGAN

By Todd Latham

David Caplan, a political leader in Ontario for many years and the first Minister of Public Infrastructure Renewal in the province, passed away suddenly this past July.

Many readers may not know this, but David was part of the launch and early success of ReNew Canada. Early in 2005, unbeknownst to either of us, the Minister and I were working on parallel plans to announce ReNew. His was a five-year, \$30-billion infrastructure plan he called ReNew Ontario and mine was a national magazine about infrastructure renewal called ReNew Canada. We made our public announcements within a day of each other at the end of May 2005. Even the upper-case 'N' was the same. It was serendipitous timing that helped raise the profile of both, and was the beginning of a relationship we shared over the many years that followed.

I invited David to write the first letter to the editor in that premier, October 2005, issue of this magazine. "The launch of ReNew Canada comes at an auspicious time. Clearly we are both concerned with the same issues: the challenge of restoring our public infrastructure, and the means we can use to do that." He also contributed to the cover

story on the 'infrastructure gap' in which he said: "We need to build our infrastructure better, smarter, and faster." A mantra we still can agree on today.

David accomplished a lot in his time as Ontario's first infrastructure Minister. He used his formidable political skills and creativity to help create an innovative public-private financing strategy (AFPs) and champion the formation of a new provincial agency (Infrastructure Ontario) to deliver accelerated building of dozens of hospitals, courts, schools, and transit system projects across the province. David's compassion and vision for a more equitable and fair society, combined with his desire to work across political spectrums and break down bureaucratic silos, also enabled him to negotiate key affordable housing agreements with the federal government and introduce the bold and award-winning Places to Grow Act which continues to protect huge areas of Ontario's greenspace from urban sprawl. We both live in the same Toronto neighbourhood, so I would see David often and sometimes we'd share policy and story ideas in our kid's school playground while waiting to pick them up after school.

Even after he left politics, he remained actively involved in the infrastructure community as vice chair of Global Public Affairs in Toronto. David was a wonderful resource for many of us; always friendly, personable, and willing to listen and offer advice. He was deeply engaged in his consulting work and had many speaking and thought leadership opportunities (including writing various articles for this publication and as a guest of honour at the Top100 Projects Dinner) that kept him in the spotlight.

David was there at the beginning of Ontario's infrastructure industry—forging new ways forward to build public infrastructure for our continued economic growth and quality of life. He was a big man in heart and in practice, and I know I am not alone in saying, with deep sadness, that he will be missed. ♣



**Todd is the founder of ReNew Canada and hopes politicians of all stripes will ensure David's legacy by emulating his zeal for smart infrastructure policy.**



David Caplan and Todd Latham at the 2017 Top100 Projects Dinner.





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