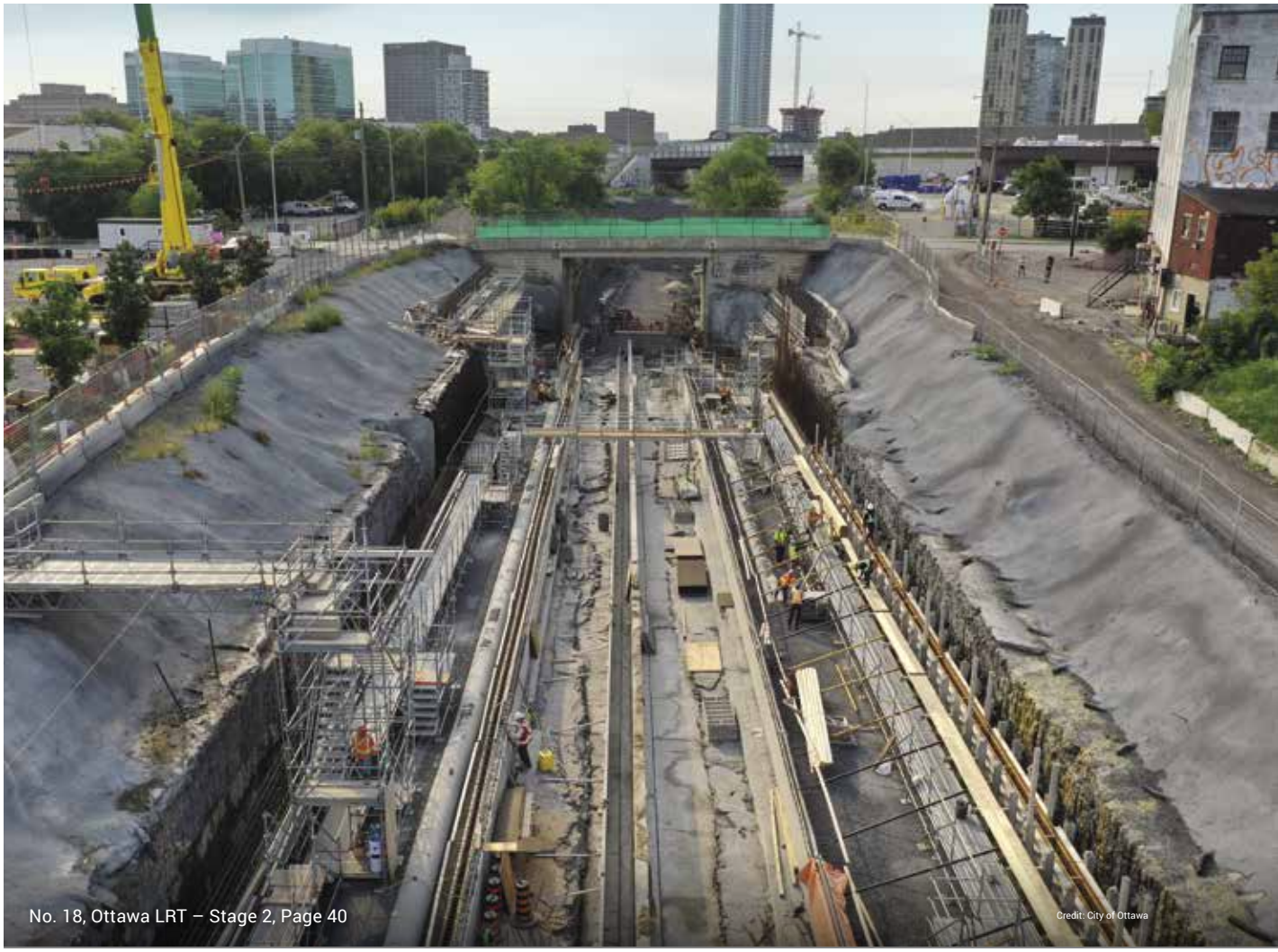
Top100

Canada's Biggest Infrastructure Projects

ReNew CANADA
The Infrastructure Magazine

2022

top100projects.ca



No. 18, Ottawa LRT – Stage 2, Page 40

Credit: City of Ottawa

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ReNew CANADA
The Infrastructure Magazine

Top100 Projects — 2022
An annual report inserted in ReNew Canada's January/February 2022 issue

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GENUINE CANADIAN MAGAZINE

Numbers Guy

I majored in history at university and then added a diploma in journalism before embarking on my career. Obviously, math was not a subject I spent much time with.

And now I find myself surrounded by numbers as the gatekeeper for ReNew Canada's annual Top100 Projects report. But not to worry, these numbers are easy to work with—even for a word guy like me.

Our Top100 Projects report—published annually since 2007—lists the biggest infrastructure investments underway across Canada, ranking the largest public infrastructure projects in the country by dollar investment, with input from project owners, governments, crown corporations, and dozens upon dozens of project delivery teams including engineers, architects, environmental consultants, lawyers, insurance and risk management, financiers and many more.

The value of the Top100 Projects has risen sharply in recent years, primarily due to an increase in multi-billion-dollar transit projects, large-scale healthcare projects and an increase in DBFOM contracts for large-scale construction. Since 2017, the assets listed under development on the Top100 Projects report have risen from $161.3 billion to a record-setting $273 billion for the 2022 report.

In light of the COVID-19 global pandemic, there have been delays, innovations and advancements in the progress of Canada's most important infrastructure projects meant to improve the quality of our health care, energy, education, transportation, culture, transit, and water assets from coast to coast.

And don't forget, we're still not done. Make sure to attend our annual gala dinner of key players and owners at The Carlu in Toronto on Feb. 22, which will feature keynote speakers and a panel discussion on the latest in health care infrastructure.

As we continue to improve the Top100 Projects report, we want to hear from you. We welcome your suggestions. Contact me at john@actualmedia.ca to discuss. As always, thank you for your input.

John Tenpenny, Editor, ReNew Canada

O&M Costs

The projects in our Top100 Projects report come with big numbers attached, which include a breakdown of where these infrastructure projects receive their funding from; be it federal, provincial, municipal, or private sources.

We present each project based on contract value, which may or may not include long-term operating and maintenance (O&M) costs. This was recently pointed out by one of our readers.

We provide the most accurate information we can, relying on project owners and publicly available information to produce the Top100 Projects report. We want our numbers to reflect the total value of the contracts for these capital infrastructure projects, but depending on the current phase of a project, the value can reflect different costs.

Giving our readers a better picture of the numbers is an ongoing process and we continually strive for improvement on this front.

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Top100 Project Index

By Rank, Project Title, and Page Reference

Buildings

Energy

Other

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Top100 Project Index

By Rank, Project Title, and Page Reference

Transit

rank project title page #

BRT

LRT

Rail

Subway

Transportation

rank project title page #

Bridge

Highway

Port

Figures

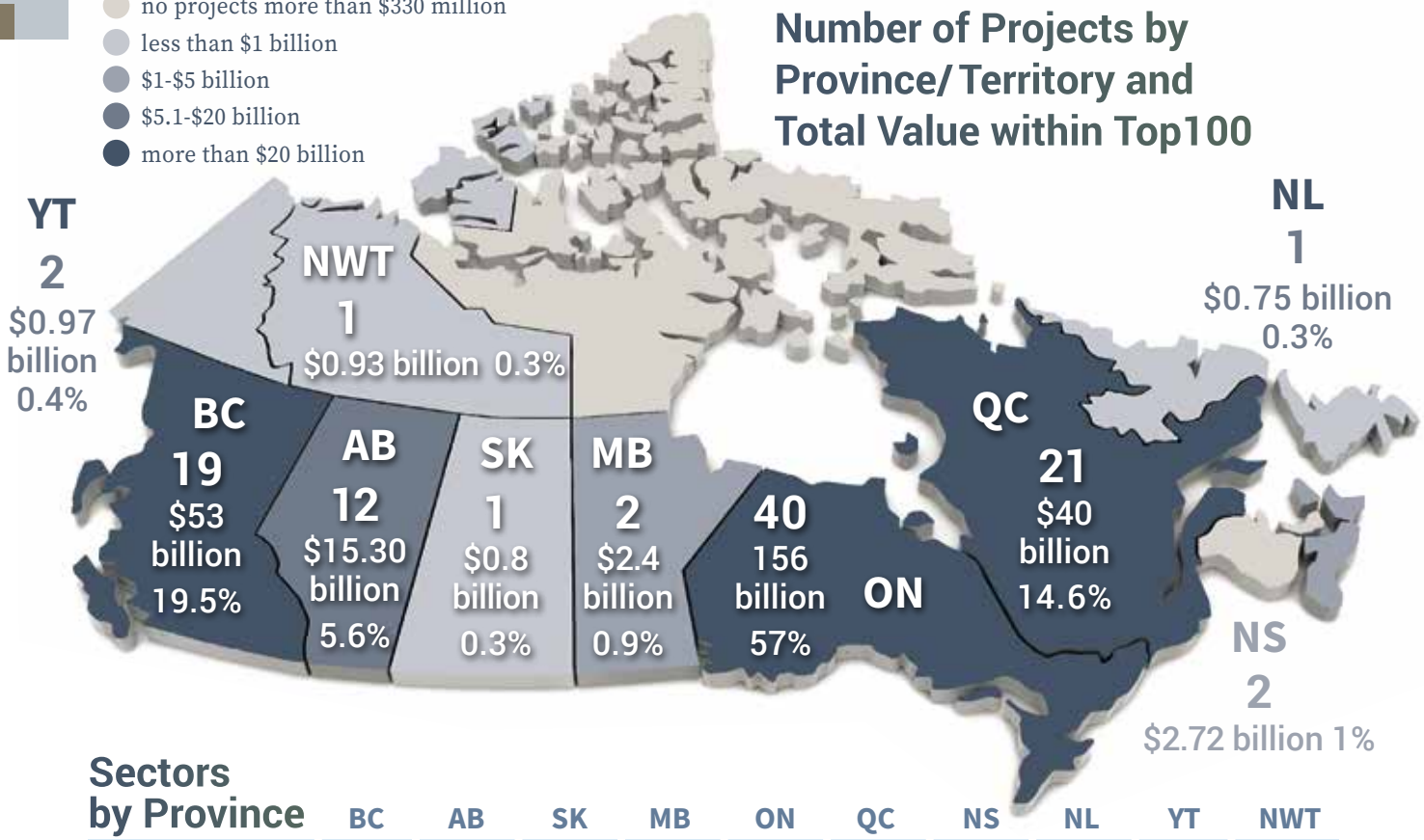
page #

Acronym Legend

AFP: Alternative financing and procurement
DBF: Design-build-finance
DB(F): Design-build-partial finance
DBFM: Design-build-finance-maintain
DBFOM: Design-build-finance-operate-maintain
EPC: Engineering, procurement, and construction
EA: Environmental assessment
JV: Joint venture
LRT: Light rail transit
P3: Public-private partnership
RFP: Request for proposals
RFQ: Request for qualifications
SUB: Subcontractor
TEUs: Twenty-foot equivalent unit containers

- no projects more than $330 million
- less than $1 billion
- $1-$5 billion
- $5.1-$20 billion
- more than $20 billion

Number of Projects by Province/ Territory and Total Value within Top100



Sectors by Province

	BC	AB	SK	MB	ON	QC	NS	NL	YT	NWT
Buildings	8	4	–	–	11	3	1	1	–	–
Energy	2	2	1	–	4	6	–	–	–	–
Transit	2	2	–	–	17	6	–	–	–	–
Transportation	5	2	–	–	3	6	1	–	1	–
Other	2	2	–	2	5	–	–	–	1	1

The ESAP Energy Services Modernization has been counted in the 'Buildings' category for both ON and QC.

Projects by Sector

Energy

Hydroelectric	Transmission	Nuclear	Solar	Natural Gas
7	3	2	2	1

Transit

LRT	Rail	Subway	BRT
13	6	5	3

Buildings

Health Care	Public Spaces	Military	Social Infrastructure
17	7	2	1

Transportation

Highway	Bridge	Port
12	3	3

Other

Water/ Wastewater	Remediation	Communications
8	3	2

MISSION CRITICAL PROJECT?

ENGAGE THE BEST TEAM OF EXPERTS

For more than 20 years HKA has helped Canadian owners, developers, contractors and counsel navigate pitfalls that could derail large, mission critical infrastructure projects. Employing over 1,000 experts and consultants worldwide, HKA's goal is to mitigate construction problems as early as possible, from pre-construction through delivery.

Top100 Projects PLATINUM 2022

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- Dispute Resolution
- Claims Management
- Claims Analysis
- Testifying Expert Witnesses
  - Quantum
  - Delay & Disruption
  - Forensic Technical Services
  - Forensic Accounting & Commercial Damages

CRUX

HKA is pleased to announce the launch of the 2021 CRUX Claims Causation Report. To access our live causation dashboard with Canadian statistics, visit www.hka.com/crux.

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Photos: BC Hydro

1 Site C Clean Energy Project

$16 billion

2021 Rank: 7

Location: Near Fort St. John, British Columbia

Owner: BC Hydro

DB(F)OM Team (Site C accommodation lodge): ATCO Two Rivers Lodging Group—ATCO Structures & Logistics Ltd. and Bird Design Build Construction Inc.

Contractor: Peace River Hydro Partners—ACCIONA Infrastructure Canada, Petrowest Corp., and Samsung C&T Canada (main civil works construction)

AFDE Partnership—Aecon, Dragados, Flatiron, EBC (spillways civil works)

Allteck Line Contractors Inc. (transmission line, Site C to Peace Canyon generating station)

F&M Installations Ltd. (substation construction, balance of plant – electrical)

Mitchell Installations Ltd. (balance of plant – mechanical)

Engineer: Klohn Crippen Berger and SNC-Lavalin (engineering and design - dam and reservoir); Tetra Tech; BGC Engineering; WSP; R.F. Binnie & Associates; Lasalle | NHC (engineering and design - other); Associated Engineering (owner's team - design); Wood (consulting)

Environmental Services: Golder (EA and permitting, archaeology, agriculture, fisheries and aquatics, socio economics); Pathfinder Endeavours Ltd.; Keystone Wildlife Research Ltd.; McMillen; RWDI Air Inc.; Knight Piésold; Industrial Forestry Service Ltd. (environmental and regulatory work); Morrison Hershfield (project review for EA authority); Hemmera

Other Key Players: AL Sims and Sons (road improvements); Aon (risk advisor); BTY Group (cost consultant); Hatch (environmental permitting); KPMG (lead commercial advisor); McElhanney (engineer, materials testing, environment, and survey); McMillen Jacobs Associates (dam/tunnel analyses: design of tunnel support); Morgan Construction and Environmental (north bank); Paul Paquette & Son's Contracting (south bank); Kasian Architecture Interior Design and Planning Ltd.; WSP; ATCO Two Rivers Lodging Group (worker accommodation lodge); Paul Paquette and Son's Contracting Ltd. (south bank clearing); Morgan Construction and Environmental Ltd. (north bank site preparation); Englobe (quality assurance services); Colliers Project Leaders; AGAT Labs; Hanscomb (cost consultant); Deloitte (risk advisor); HKA

Suppliers: Voith Hydro (turbine and generator); ATB Riva Calzoni Hydro Canada Inc. (hydromechanical equipment); Advanced Precast

Legal: Dentons Canada (owner's counsel); Borden Ladner Gervais (legal advisor); Bennett Jones (acted for successful proponent)

Substantial Completion: 2025

Funding: Public

This hydroelectric earthfill dam on the Peace River includes several components: an earthfill dam 1,050 metres long and 60 metres high, a 1,100-MW generating station and associated structures, an 83-kilometre-long reservoir, realignment of six sections of Highway 29, and two 77-kilometre transmission lines along an existing transmission line right-of-way, connecting Site C to the existing provincial power grid.

On February 26, 2021, the B.C. government announced a revised cost estimate of $16 billion and an expected one-year delay in the project's in-service date (now 2025). The updated budget was approved by the provincial Treasury Board in June. Because of delays and impacts related to the pandemic, COVID-19 is the single largest contributor to the cost increase.

Despite the challenge of the COVID-19 pandemic, the project continued to advance in 2021. In the generating station and spillways civil works area, construction progressed with the ongoing placement of concrete in the powerhouse, intakes and spillways; installation of the penstock segments; and construction of the steel superstructure for the powerhouse. In the main civil works area, river diversion was successfully achieved in October 2020, and the upstream and downstream cofferdams were completed to their final elevations in spring 2021. Roller-compacted concrete (RCC) placements resumed at the dam and core buttress on the right bank; the entire RCC program is on track to be completed in fall 2021. Placements of dam core and fill material began on the left, centre section and right banks of the earthfill dam. Excavations in the approach channel also continued.

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BUSINESS AS UNUSUAL

Credit: Philip Hall/Metrolinx

2 GO Expansion – On-Corridor Works

$15.705 billion

2021 Rank: 1

Location: Greater Toronto and Hamilton Area

Owner: Metrolinx

Procurement Agent: Infrastructure Ontario

Engineer: Morrison Hershfield (planning and environmental); Wood (consulting); WSP (design)

Other Key Players: Dillon Consulting (architectural services); Golder (geotechnical studies); EY (mgmt. consultant); Deloitte (mgmt. consultant); Comtech (project mgmt. consultant); Entuitive

Funding: P3

Substantial Completion: 2025

The GO Expansion On-Corridor Works consists of the core infrastructure and services that will allow Metrolinx's rail corridor to run two-day, all-day service at a frequency of every 15 minutes, throughout the Greater Toronto and Hamilton Area (GTHA) network.

The scope of the work, as defined by Metrolinx and Infrastructure Ontario through the procurement process, includes:

- Operation of train services including train driving;
- Timetable planning, train control and dispatch for all operators across the GO-owned rail network;
- Design, build, integration, maintenance, rehabilitation or renewal of the railway corridor (civil infrastructure, tracks, systems, signaling, rolling stock, etc.);
- Refurbishment, maintenance, servicing and cleaning of all rolling stock and procurement of new rolling stock;
- Construction of new maintenance and train storage and/or layover facilities;
- Reconstruction of Union Station track and platforms; and
- Compliance with Metrolinx safety, security and emergency management policies.

Four prequalified consortiums were announced on May 30, 2019. The proposal process is underway with two teams remaining to bid on the project, and a successful team is expected to be announced late 2021.

Transit Expansion

The Top100 includes 27 projects and $121.3 billion invested in LRT, rail, subway, and BRT infrastructure.

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Photos: Bruce Power

3 Bruce Power Refurbishment

$13 billion*

2021 Rank: 2

Location: Tiverton, Ontario

Owner: Bruce Power

DBFM Team (Office Complex and Training Facility): Concert Infrastructure—Bird Construction, Stantec Concert Realty Services—Stonebridge Financial Corp.

Engineer: Hatch (preliminary/planning study); Wood (design); Tetra Tech (MCR)

Contractor: AECOM, Aecon, AREVA NP (Unit 6 steam generator replacement); Black & McDonald (Unit 6 mechanical and electrical projects); Shoreline JV: Aecon, AECOM, SNC-Lavalin (Fuel Channel Feeder and Replacement program)

Other Key Players: WSP (drafting support); Golder; Deloitte; AGAT Labs (analytical testing); Burns & McDonnell (integrated project controls support)

Suppliers: Laker Energy Products (end fittings, liners, and flow elements); BWXT Canada Inc. (steam generators); Nu-Tech Precision Metals (zirconium alloy pressure tubes); Cameco Fuel Manufacturing (calandria tubes and annulus spacers);

Legal: Osler (lead counsel); Torys (acting for the lender)

Funding: Private

Substantial Completion: 2030

* All capital cost is disclosed by TC Energy

In December of 2015, Bruce Power announced its plan to refurbish six of its eight nuclear reactors at its plant near Kincardine, Ont. The project, originally scheduled to commence in 2016, was postponed until 2020 based on the usable life of the reactors. The 15-year refurbishment project will include work on six of the plant's eight CANDU reactors. The eight reactors produce 6,300 MW of power annually, approximately 30 per cent of Ontario's current energy usage. The Bruce Power refurbishment project will make up to 23,000 jobs possible and generate about $6.3 billion in annual economic benefits in communities throughout the province. The new agreement between the Ontario government and Bruce Power has achieved $1.7 billion in savings for electricity customers when compared to the forecast in the 2013 Long-Term Energy Plan (2013 LTEP). This means a reduction in forecast household electricity bills by about $66 each year over the next decade according to the Ontario government. Bruce Power is investing approximately $13 billion of its own funds to cover the costs associated with the refurbishment, and agrees to take full risk of cost overruns on refurbishments of the six nuclear units. In October 2020, the project reached an important milestone as workers have completed the preparations to begin the major component replacement with the successful installation of protective shielding and 16 bulkheads, weighing over seven tons each, to isolate Unit 6 from the operating units. The majority of the Major Component Replacement work in 2022 will involve the installation of Unit 6 reactor components. This will include the upper feeder install and lower feeder installations, calandria tube installations, fuel channel assembly installation and moderator refill. In addition, the final major system outage commenced in December 2021 and will be complete in June 2022. It encompasses conventional systems including pressure vessels, heat exchangers, turbine generator, isolated phase bus and other high-voltage work, large motors and pumps. The return to service of Unit 6 will continue through 2022, leading to project completion in 2023.


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Photos: OPG

4 Darlington Nuclear Refurbishment

$12.8 billion

2021 Rank: 3

Location: Clarington, Ontario

Owner: Nalcor Energy; Ontario Power Generation

Project/Construction Manager: Aecon Group Inc./SNC-Lavalin JV (execution phase of the retube and feeder replacement)

Engineer: Wood Group (consulting)

Contractor: Generation: Andritz Hydro Canada, Astaldi Canada, Barnard-Pennecon JV

Transmission: GE Energy (formerly Alstom Grid Canada and Alstom Renewable Power Canada), Andritz Hydro Canada, H.J. O'Connell Construction, Valard Construction

Other Key Players: GE Power; ABB; Amec Foster Wheeler; Deloitte; Kiewit; Black & McDonald; Tetra Tech; BDI Canada; Burns & McDonnell/Modus (Independant Project Oversight); Cameco (calandria tubes and annulus spacers); Alstom AA6Power & Transport Canada Inc. (turbine generator refurbishment); Hatch (engineering services); Armtec; Comtech (Project Control Consultant Services); Golder

Supplier: DECAST Ltd.; Laker Energy (nuclear components); Nu-Tech Precision Metals (calandria tubes)

Legal: Blake, Cassels & Graydon; Torys (acting for the owner)

Funding: Public

Substantial Completion: 2026

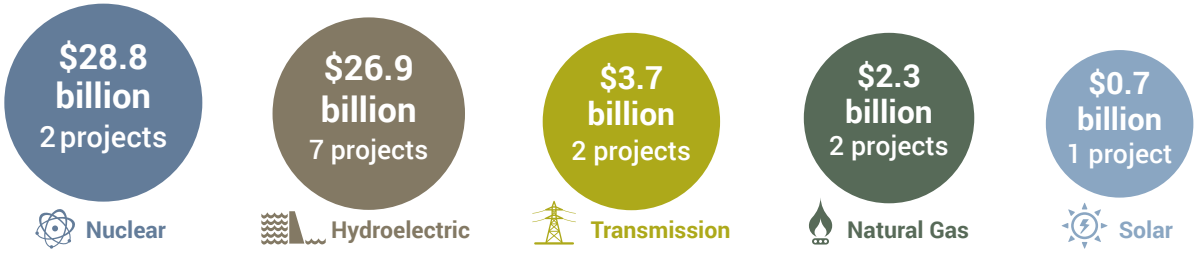
The commencement of the execution phase marks the joint venture's (JV) successful delivery of the definition phase (2012-2016) of the project, which included the construction of a full-scale reactor mock-up facility to simulate key elements of the refurbishment work and the testing of specialized tooling and to help prepare a comprehensive estimate and schedule for the project. A $35-million reactor vault mock-up and re-tube and feeder replacement (RFR) was completed as part of the preliminary phase of the refurbishment project. Led by SNC Lavalin Nuclear (SLN) and Aecon Nuclear, the mock-up helped to train the team for feeder and fuel channel replacements to be undertaken as part of the overall refurbishment project. The execution phase of the project will involve the replacement of main reactor components using tools and methods that were developed and tested during the project's definition phase, carried out by the JV. Each of the four Darlington Candu reactors will be taken out of service sequentially for approximately three years to allow for the replacement of fuel channels, feeder pipes, calandria tubes and end fittings. The overall project is scheduled for 112 months. In June 2021, the team completed Bellows severing which marked the completion of Segment 2A on the Unit 3 Refurbishment project. This segment of the project started with opening the Unit 3 airlock doors for the first time since the station began producing power in the 1990s. All interfering components have now temporarily been removed in the vault, making way for the removal of core components and installation of the feeders, which took place over the next few months. The project team is now well-positioned for success on the next segment of work for the Refurbishment project which is currently underway—Segment 2B. This segment will feature end-fitting removals, calandria tube insert release and removal, and pressure tube and calandria tube removal.

Energy Development in Canada

Total investment in Energy: 17 projects at $59.4 billion

Generation

14 projects, $55.7 billion



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- Phase out coal by 2030
- Reduce greenhouse gas emissions 40% to 45% below 2005 levels by 2030
- Create a net-zero electricity grid by 2035
- Achieve net-zero emissions by 2050

- This means that Canada will need to **TRIPLE** the amount of electricity it produces over the next thirty years.
- We need all available sources of clean energy to address the climate emergency, including **nuclear energy.**
- Nuclear can provide the clean electricity needed to decarbonize electricity grids and power the electrification of transportation and buildings.
- There is no realistic pathway to net-zero emissions by 2050 without nuclear.

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Credit: Metrolinx

5 Eglinton Crosstown LRT

$12.259 billion

2021 Rank: 5

Location: Toronto, Ontario

Owner: Metrolinx

Procurement Agent: Infrastructure Ontario

DBFM Team: Crosslinx Transit Solutions—ACS Infrastructure Canada, Aecon, EllisDon, SNC-Lavalin, and Dragados Canada

Contractor: Design-Build JV: Aecon Infrastructure Management, Dragados Canada, EllisDon, and SNC-Lavalin Constructors (Pacific)

Engineer: Jacobs and 4 Transit (WSP, Hatch, and Parsons) (consulting engineer, technical advisor, construction oversight); AECOM (consulting engineer, preliminary planning/study, design); Wood (consulting); LEA (design)

Architect: Station Architects; IBI Group; NORR Limited Architect & Engineers; DIALOG; Daoust Lestage

Other Key Players: AECOM (consulting engineer, preliminary planning/study, design); Aon (risk advisor); Arup (preliminary design work); BTY Group (independent certifier); Caterpillar; Entro; Entuitive (structural eng. consultant); EY (advising gov't.); EXP (instrumentation and monitoring); Golder; Hanscomb (preliminary and concept designers' cost consultant for 7 stations); Infrastructure Ontario; INTECH (insurance advisor); McCormick Rankin; Munro (concrete); Norton Rose Fulbright; Obayashi Canada; Kenny Construction; Kenaidan Contracting; Technicore (contractors); URS/Parsons JV (systems design); WSP (program manager and engineer, GIS); CRH Canada (cement supply); Dufferin Construction (prep work); McMillen Jacobs Associates (independent verifier); Mott MacDonald (track design review and tunnel construction management); Englobe (geotechnical studies); CIMA+ (traffic mgmt. and road safety audits); Morrison Hershfield (transit operations and maintenance advisory services); GHD (traffic mgmt., site civil support); AGAT Labs; Comtech (consulting services); Deloitte; Geosolv; HKA

Supplier: Bombardier (vehicle); DECAST Ltd. (precast tunnel liner segments); CRH Canada (cement); Canam Group (steel fabricator)

Financiers/Banks: National Bank Financial and Scotiabank Global Banking and Markets (underwriters); Alberta Treasury Branches; Caisse Centrale Desjardins; Bank of Nova Scotia; Bank of Tokyo-Mitsubishi UFJ; and Toronto-Dominion Bank (mandate lead arrangers); BMO Capital Markets (financial advisor)

Legal: Blake, Cassels & Graydon (Metrolinx legal advisor); Fasken Martineau DuMoulin (advising lenders to consortium); Borden Ladner Gervais (legal advisor); DLA Piper (Canada); Norton Rose Fulbright

Funding: P3

Substantial Completion: 2022

This light-rail transit line will run along Toronto's Eglinton Avenue between Mount Dennis (Weston Road) and Kennedy Station. Part of the Government of Ontario's light-rail transit plan for the city, this 19-kilometre corridor will include an 11-kilometre underground portion between Keele Street and Laird Drive. When running at street level, the line will carry passengers in dedicated right-of-way transit lanes separate from regular traffic with priority signaling at intersections. Travelling at an average speed of 28 km/h, it will link to 54 bus routes, three subway stations, and various GO Transit lines. The capacity of the LRT vehicles is 15,000 passengers per hour per direction, with the flexibility to easily remove or add cars. Projected ridership is 5,400 passengers per hour in the peak direction by 2031. The final pieces of trackwork for the project were being installed during the fall of 2021. Installation of the overhead catenary system (the wires that power the trains), train signals, communications systems and other features to enable safe train movement will continue into 2022. By the end of the year, rail will run continuously from the Maintenance and Storage Facility, located on the site of the former Kodak lands, to Kennedy Station.

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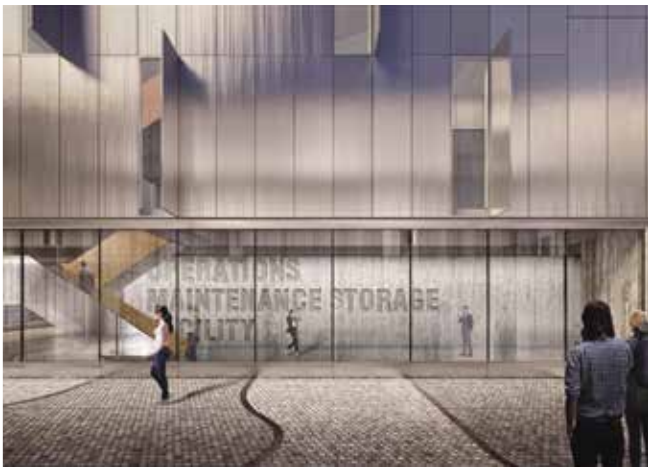

Photos: Metrolinx

6 Ontario Line
$10.9 billion

2021 Rank: 6

Location: Toronto, Ontario

Owner: Metrolink

Procurement Agent: Infrastructure Ontario

Other Key Players: Aon (risk advisor); Golder (geotechnical studies); Hanscomb (cost consultant); EY (mgmt. consultant); Jacobs; Comtech; HDR (technical advisory services); Hatch; Wood; Entuitive; WSP (TTC Operators representative); LEA (engineer design); INFRATA managing consultant)

Suppliers: DECAST

Funding: Public

Substantial Completion: 2030 (to be confirmed following procurement completion)

The Ontario Line is a 15.6-kilometre stand-alone rapid transit line that will connect the Ontario Science Centre to Exhibition/Ontario Place. Over half of the route is planned to run underground through new tunnels, with the remainder running along elevated and at-grade rail corridor sections of track. Fifteen stations are proposed, with numerous connections to the broader transit network, including GO Transit rail services, the Toronto Transit Commission's subway Lines 1 and 2, the future Line 5 (Eglinton Crosstown LRT), as well as numerous bus and streetcar routes. The Ontario Line is one of four priority transit projects announced by the Province in 2019 for the Greater Toronto and Hamilton Area. Planning is underway for all four subway projects and procurements for the subway program are being staged to ensure each project is delivered successfully. In December 2020, Requests for Proposals were issued for two of three P3 contracts to be issued in the delivery of the Ontario Line: the Southern Civil, Stations, and Tunnel project and the Rolling Stock, Systems, Operations and Maintenance (RSSOM) project. Metrolinx announced in June 2021 that qualified companies could submit bids for early works that will get Exhibition Station ready for major Ontario Line construction. This work, which is separate from the main contracts for South Civil, stations and tunnel and North Civil, stations and tunnel, will help make sure major upgrades needed at the station can be done quickly and safely while keeping existing GO customers moving.

Funding Source Breakdown

Sector	Total Investment	Federal	Provincial	Municipal	Private
Transit	121.3 billion	14.4 billion	92 billion	11.4 billion	3.5 billion
Energy	59.4 billion	–	44.2 billion	–	15.2 billion
Buildings	38.5 billion	10 billion	25.6 billion	0.4 billion	2.5 billion
Transportation	27.5 billion	9.5 billion	13.3 billion	2 billion	2.7 billion
Water/Wastewater	18.9 billion	0.8 billion	11.2 billion	6.9 billion	–
Communications	4.7 billion	0.6 billion	3.9 billion	–	0.2 billion
Remediation	2.7 billion	2.7 billion	–	–	–
2022 Top100	273 billion	38 billion	190 billion	20.9 billion	24.1 billion

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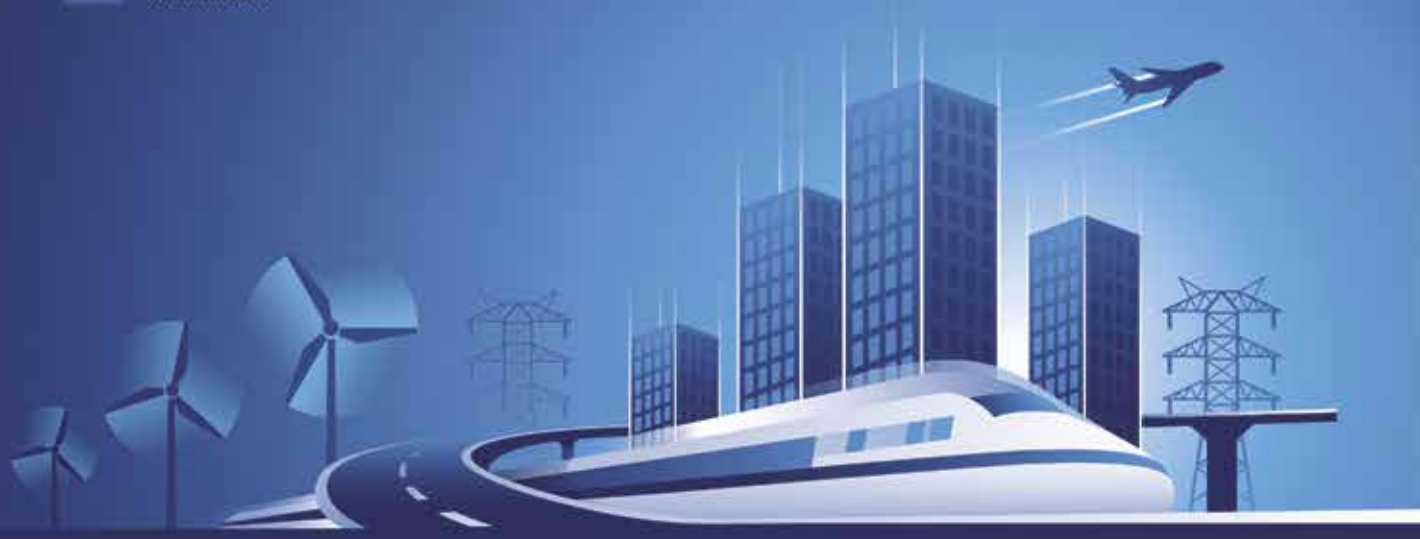

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Top100 Projects PLATINUM 2022

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Credit: Metrolinx

Credit: Metrolinx

7 GO Expansion Projects – Early Works

$10.513 billion

2021 Rank: 8

Location: Greater Toronto and Hamilton Area

Owner: Metrolinx

DBF Team (Highway 401 Rail Tunnel):
Toronto Tunnel Partners
- Applicant Lead: EllisDon Capital Inc. and STRABAG Inc.
- Construction: EllisDon Civil Ltd. and STRABAG Inc.
- Design: WSP Canada Inc., Dr. Sauer & Partners, Amec Foster Wheeler (Wood)
- Financial Advisor: EllisDon Capital Inc. and STRABAG Inc.

DBF Team (Davenport Diamond Grade Separation project): Graham Commuter Rail Solutions
- Applicant Lead: Graham Capital Partners LP and Gracorp Capital Ltd.; Graham Construction and Engineering LP
- Construction: Graham Construction and Engineering LP
- Design: LEA Consulting Ltd. as Design Lead; EXP; International Bridge Technologies; Brown & Storey Architects Inc.
- Financial Advisor: Graham Capital Partners LP

Contractor: EllisDon (Dufferin/Queen bridge); Kenaidan/Cole Engineering (rapid pedestrian tunnels)

Engineer: Wood (consulting); Parsons; Hatch; AECOM

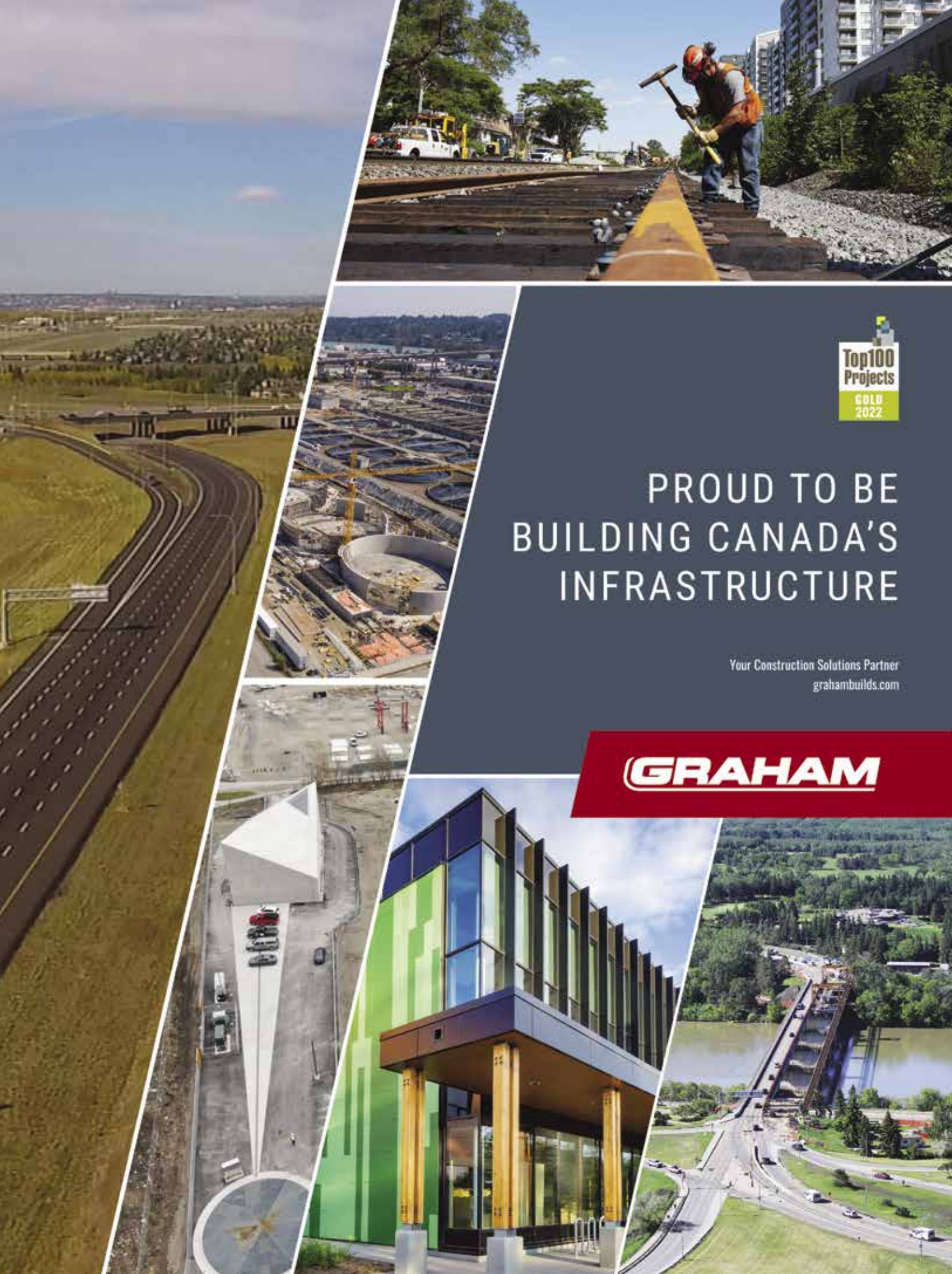
Other Key Players: 4-Transit JV (technical advisory services): Hatch, Parsons, WSP; CIMA+ (utilities relocation); Morrison Hershfield (owner's technical advisors team (sub-consultant to Gannett Fleming); Comtech (program/project consulting); Jacobs (program mgmt.); A.W. Hooker Associates Ltd. (cost consultant); Golder (environmental services); INTECH Risk Management, CIMA+; Deloitte (transaction advisor); Aon (risk advisor); Comtech (mgmt. consulting services); Arcadis (environmental services); DECAST; Hemmera; Entuitive

Legal: Borden Ladner Gervais

Funding: Public

Substantial Completion: 2025

The Early Works portion of the GO Expansion project is one of three blocks of works to be done to accommodate two-way, all-day transit throughout the GTHA corridot. According to the Fall 2018 business case, this work represents: "including both on-corridor and off-corridor civil works such as new track, station improvements, grade separations and utility relocations, that are either enabling infrastructure for future service increases, needed state of good repair improvements or components that can be delivered early, to reduce schedule risk for the program." There are over 50 individual projects included in the early works program, including 40 smaller projects delivered as Design-Build or Design-Bid-Build, along with 12 larger projects delivered as Build-Finance and Design-Build-Finance. The latter includes the Davenport Diamond Rail Grade Separation Project, for which the winning bidder was selected in July 2019, and the Highway 401 Rail Tunnel, which began construction in March 2019, and the Stouffville Corridor Stations Improvement project. The program also includes infrastructure renewal at Union Station, including construction of a new South Concourse, track expansion east of the station and replacement of the 90-year-old signaling system with new state-of-the-art signals, communications, power supply, CCTV, and SCADA systems.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Credits: Metro Vancouver

8 Iona Island Wastewater Treatment Plant

$10 billion

NEW

Location: Richmond, British Columbia

Owner: Metro Vancouver

Engineer: AECOM, Jacobs

Architect: Space2Place, Local Practice

Other Key Players: Musqueam Indian Band

Funding: Public

Substantial Completion:
Phase 1 Early and Enabling Works: 2026
Phase 2 Treatment Plant and Related Works: 2026+

The existing Iona Island Wastewater Treatment provides primary treatment for communities in Vancouver, the UBC Endowment Lands and parts of Burnaby and Richmond. As the facility reaches the end of its service life, Metro Vancouver has a once-in-a-lifetime opportunity to positively contribute to the health and well-being of people, as well as the ecological health and biodiversity of the Fraser River Estuary and the Salish Sea. The new plant will provide tertiary-level treatment and meet the latest seismic standards, account for future sea level rise and incorporate cutting-edge technologies for resource and energy recovery, greenhouse gas reductions, odour reduction and energy efficiency. Metro Vancouver is working to ensure the new facility contributes positively to the community and is working closely with stakeholders and 14 local First Nations, particularly the Musqueam Indian Band. The project also includes a suite of 20 ecological projects to enhance freshwater wetland habitat for birds and wildlife.
Image: Conceptual rendering (2021) is subject to refinement.


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Credit: Hydro-Québec

9 Romaine Complex

$7.2 billion

2021 Rank: 10

Location: Havre-Saint-Pierre, Quebec

Owner: Hydro-Québec

Contractor:

- Romaine-1: Hamel-CRT, Cegerco, Construction Proco, a consortium of Cegerco and Fernand Gilbert, Groupe Hexagone, Pomerleau, a consortium of J. Euclide Perron and Inter-cité Construction, a consortium of Neilson & EBC Construction, LAR Machinerie and Canmec Industriel.
- Romaine-2: RSW/SNC-Lavalin
- Romaine-3: Hamel-CRT, EBC-Neilson, Canmec Industriel, Construction Proco, Couillard Construction, Groupe Hexagone, Groupe LAR, COH, HMI Construction, Neilson-EBC, Cégerco, Nordex, Consortium ATA
- Romaine-4: EBC Inc.; Pomerleau

Engineer:

- Romaine-1: AECOM
- Romaine-2: Groupe RSW and SNC-Lavalin
- Romaine-3: AECOM

Other Key Players: Tetra Tech (design and construction support); WSP (EA and access roads); CRT Construction (excavation and concreting, road and dam construction); GHD (geotechnical and material technology); CIMA+; Englobe (QA inspection services); EXP (Building plans and specifications and addition/modifications to positions (substations); Deloitte

Supplier: Les Excavations Marchand et Fils (cement); Voith Hydro (turbine for Romaine-1); GE Energy (turbine for Romaine-3)

Legal: Borden Ladner Gervais

Funding: Public

Substantial Completion: 2022

This 1,550-MW hydroelectric complex on the Romaine River involves four generating stations and reservoirs spaced over 150 kilometres along the Romaine River, located on the North Shore of the Gulf of St. Lawrence. Each station will have an associated rockfill dam, two generating units, and a spillway. One permanent access road 150 kilometres long will also be built as part of the project linking the generating station to the regional highway. Hydro-Québec began its work in summer 2009. Romaine-2 was commissioned in 2014, followed by Romaine-1 in 2015, and Romaine-3 in 2017. Work on Romaine-4 is underway, and includes building of all the structures associated with a new power generation facility: generating station, dam, diversion, spillway, tailrace canal, headrace tunnel, etc. Excavation of the spillway and water intake, along with the temporary diversion structure, were completed in 2018. In 2021, Romaine-4 reservoir filling was finished and construction work on Romaine-4 dam was completed. Concreting at Romaine-4 generating station will continue in 2022 and the project is expected to be commissioned in the last months of 2022.

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Credits: TTC

10 TTC Vehicles Program

$7.175 billion

NEW

Location: Toronto, Ontario

Owner: Toronto Transit Commission (TTC)

Other Key Players: Entuitive; WSP

Suppliers: Alstom SA; New Flyer Industries Inc; Proterra Inc.; BYD Canada Co. Ltd.; Creative Carriage Ltd.; Ontario Power Generation; Toronto Hydro

Funding: Public

Substantial Completion: 2022-2036

The Toronto Transit Commission is upgrading its fleet, including 264 new streetcars ($1.613 billion), new Wheel-Trans vehicles ($363 million) as well as hybrid and electric buses ($4.413 billion). An electrification program ($766 million) covers the electrification infrastructure to support the charging of electric buses according to the Green Bus Technology Plan approved by the TTC Board. In 2022 the program aims to complete design for Eglinton, Wilson and Malvern garages and phase two construction at Wilson and Birchmount garages. By 2024, the TTC will complete installation of 60 e-chargers at three TTC garages (Arrow Road, Mt. Dennis and Eglinton) and plans electrification of the entire fleet by 2036. For the electric and hybrid bus projects, the TTC aims to deliver the pilot vehicle for the next round of procurement and start full production delivery in 2022. The Wheel-Trans project plans to deliver 109 seven-metre Wheel-Trans buses in 2-022, as well as start design and award the contract for the next round of six-metre buses.

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Credit: Alstom/C. Fleury


Credit: REM/NouvLR


Credit: Caisse

11 Réseau express métropolitain

$6.9 billion

2021 Rank: 11

Location: Montreal, Quebec

Owner: CDPQ Infra

Contractor:
- EPC contract: Groupe NouvLR— SNC-Lavalin Grands Projets Inc.; Dragados Canada Inc.; Groupe Aecon Québec Ltée; Pomerleau Inc.; EBC Inc.
- RSSOM Contract: Groupe des Partenaires pour la Mobilité des Montréalais—Alstom Transport Canada Inc.; SNC-Lavalin O&M Inc.
- Conception: SNC-Lavalin Inc.; Aecom Consultants Inc.

Engineer: CIMA+; Hatch; Parsons (consulting)

Design: Lemay; Bisson Fortin; Perkins+Will; Provencher Roy

Other Key Players: Hanscomb (advisory services for design, engineering, and costing); EXP (feasibility and diligence studies); WSP (geotechnical); Aon (risk advisor); GHD (geotechnical/testing); INTECH Risk Management; Deloitte (due diligence advisor); Englobe; Canam Group; Jacobs; HKA

Legal: Norton Rose Fulbright (advising CDPQ Infra); Lavery de Billy (advising CDPQ Infra); Borden Ladner Gervais (advised NouvLR); Davies Ward Phillips & Vineberg (advised PMM); Stein Monast (advised the Quebec Government); Fasken Martineau DuMoulin (advisor for ARTM)

Funding:
Public-Private
- CDPQ Infra - $3.5 billion
- Government of Quebec - $1.28 billion
- Government of Canada (through the Canada Infrastructure Bank) - $1.28 billion
- Hydro Quebec - $295 million
- ARTM - $512 million

Substantial Completion: 2024

The Réseau express metropolitain (REM) will be a new integrated network linking downtown Montreal, South Shore, West Island, North Shore, and the airport. Once completed, the REM will be the fourth largest automated transportation system in the world after Singapore (82 kilometres), Dubai (80 km) and Vancouver (68 km). For the metropolitan area, the REM also represents the largest public transportation infrastructure since the Montreal metro, inaugurated in 1966.

Combined with existing transportation networks (metro, trains and buses), the REM opens a new era of public transit development in the Greater Montreal area:
- 27 stations—67 kilometers—20 hours a day—7 days a week
- This constitutes Québec's first "public-public" partnership project

Despite construction delays due to COVID-19, progress has been made along the entire length of the project. This includes the construction of a new North Shore bridge using the counterweight launching methodology.

In 2021, with the closing of the Deux-Montagnes line, the project now has construction sites fully deployed on the 67 kilometres of the network. There are more than 30 active construction sites around the Greater Montreal area.

The first tests of the REM in automated mode were also conducted on the South Shore, on a 3.5-km section of the REM route between Brossard station and Milan Boulevard. This specific zone is called the "representative segment." All system components (telecommunications, electrical system, etc.) were tested there, under various weather conditions.

From start to finish: Pomerleau's unique approach to self-performed work

Sometimes, if you want something done right, you must do it yourself. That's what great teams do. And they do it by working with agility and adaptability and leveraging the wide array of strengths and skills of all their members.

Pomerleau has achieved this level of excellence coast to coast by developing and maintaining its capacity to deliver self-performed work on complex and innovative projects that truly impact Canadian communities.

From Victoria to St-John's NL, Pomerleau carries out complex projects in deep foundation, marine construction, as well as concrete, earthworks and urban infrastructure. It does so with its own people, its own expertise, its own equipment, and by training its staff as well as its trade partners to use technologies like Building information management (BIM), to optimize work from planning through to post-construction.

Whether it's caisson, driven or secant piles, combined walls, bridges, wharves, docks, dredging, various complex municipal utilities or other special projects such as an entire light rail transit system, Pomerleau's ability to deliver using the self-perform model gives it unique, distinctive position in the Canadian market.

"We are proud of the projects we can undertake. It's important to have the tools and the technologies, but what allows us to strive for excellence while working in self-perform mode is most definitely our people's know-how, their ability to problem solve, and their dedication to the work," says Daniel Lessard, Executive Vice President, Civil and Infrastructure.

Take for example the company's ability to perform marine work, both on and under water, which requires innovative approaches and as well as particular considerations for the safety and security of the team involved. Using 3D scans and modelization, as well as BIM, allowed Pomerleau to save time and identify efficiencies while working under water. Recently, the Canadian construction leader used all these technologies to configure all the equipment required for the deconstruction of the old Champlain Bridge over the St. Lawrence River, and to carefully plan all the stages of its demolition.

Using a Kelly-type drill to build a circular watertight retaining wall with 100 secant piles measuring more than 20 meters for the access well of a train station under the Montreal-Trudeau airport is far from simple. The same goes for using a tunnel boring machine under the Fraser River for a wastewater treatment plan outfall. Pomerleau has the team, the equipment and know-how to complete this type of jobs, which are often unseen by the public and yet instrumental to the development of infrastructures that have a major impact on the daily lives of thousands.

The company, which has a long-standing track record of community engagement, recently launched a new corporate engagement policy to guide its next steps as it continues to forge meaningful relationships with local organizations coast-to-coast. Making Canada more sustainable for future generations is one of the tenants of this policy. Pomerleau is also working to transform and make its operations greener and more sustainable. But that's not all. Pomerleau is also called to protect various ecosystems while performing complex work. Take the Champlain bridge deconstruction project in Montreal as an example. While having 50 to 100 barge movements weekly to demolish a 3.4km-long structure piece by piece and recover 90% of the material. Pomerleau and its partners have focused on protecting the marine natural habitat and managing the quality of the water at every step.

Every project is unique. No matter how, complex or colossal it might be, the variety of expertise and equipment that Pomerleau has allowed it to complete any type of project in a self-performed mode, coast-to-coast, rain or shine. As the construction industry undergoes a technological revolution, this bares the question, what's next for Pomerleau?

POMERLEAU

12 Gordie Howe International Bridge

$5.7 billion

2021 Rank: 12

Location: Windsor, Ontario to Detroit, Michigan

Owner: Windsor-Detroit Bridge Authority (WDBA)

Project/Construction Manager: Deloitte

DBFOM Team: Bridging North America—ACS Infrastructure Canada Inc.; Fluor Canada Ltd.; Aecon Concessions; RBC Dominion Securities Inc.; AECOM; Carlos Fernandez Casado S.L/FHECOR Ingenieros Consultores, S.A.; Moriyama and Teshima Architects; Smith-Miller + Hawkinson Architects LLP; Dragados Canada Inc.; Aecon Infrastructure Management Inc.; Turner Construction Company; Aecon O&M, a division of Aecon Construction Group Inc.; DBI Services, LLC; URS Federal Services, Inc. (AECOM)

Engineer: Parsons (owner's engineer)

Other Key Players: EY (advising team); Golder (geotech./foundation engineering); Hanscomb (owner's cost consultant and special advisor); Kasian (PDC team); LeighFisher (lender's technical advisor); INTECH Risk Management (insurance advisor); CIMA+ (transmission relocation design); WSP (environmental services); Aon (risk advisor); Parsons (bridge technical advisor); Tetra Tech; Rider Levett Bucknall; A.W. Hooker Associates Ltd. (cost consultant); Canam Group; Englobe; EXP (engineering and testing services); HKA; Morrison Hershfield; INFRATA (managing consultant)

Supplier: Entro (signage and wayfinding)

Legal: Fasken Martineau DuMoulin (transaction advisor); Blake, Cassels & Graydon (legal advisor to the proponent)

Funding: P3

Substantial Completion: 2024

This crossing is the largest and most ambitious binational border infrastructure project along the Canada–United States border. It includes a new six-lane bridge across the Detroit River, associated border inspection plazas, and connections to the freeway systems in Ontario and Michigan. This project will provide a new alternative crossing for this trade corridor.

The Canada-Michigan Crossing Agreement, signed in June 2012 by Canada and Michigan, provided a framework for the construction, financing, operation, and maintenance of the new publicly owned bridge. The agreement called for the establishment of both a crossing authority, known as the WDBA, to deliver, procure, and fund the project through a P3 and an international authority to oversee the project procurement and the compliance with the agreement.

Work on all four components of the project is being conducted simultaneously: Canada and U.S. Points of Entry, the Michigan I-75 Interchange, and the bridge itself. Current work including earthworks and utility locations at the Points of Entry and the start of construction on the tower footings.

Activity over the past year has focused on the tower construction on both sides of the border. At present, the two towers (note that towers are being built on land) have reached approximately 70 metres. Once complete, the towers will reach 220 metres in height. Work continues on the other components of the project, the Canadian and US Ports of Entry and the Michigan Interchange. We have now started construction of some of the various buildings which are needed at the ports of entry, including the Maintenance building and the Main Inspection facility on the Canadian side and the Secondary inspection building on the U.S. side.

13 Hurontario LRT

$5.632 billion

2021 Rank: 13

Location: Mississauga and Brampton, Ontario

Owner: Metrolinx

Project Agent: Infrastructure Ontario

DBFOM Team: Mobilinx Hurontario General Partnership

- Applicant Lead: John Laing, Astaldi, Hitachi, Transdev, Amico Concessions, Salini Impregilo
- Construction: Astaldi, Hitachi, Amico, Bot, Salini Impregilo
- Design: IBI Group, Hitachi, Morrison Hershfield, Arcadis, Daoust Lestage, EXP
- Operation Maintenance & Rehabilitation Provider: Transdev, Hitachi, Astaldi, Salini Impregilo
- Financial Advisor: National Bank, HSBC

Engineer: SNC-Lavalin (project lead); Steer Davies Gleave (preliminary engineering)

Other Key Players: DIALOG (urban design); Dufferin Construction; Golder (preliminary geotechnical services); Hanscomb (preliminary design engineer's cost consultant); Hatch; LEA Group (ITS); Aon (owner advisor and construction insurance broker); AECOM (owner's representative/ technical advisor); EY (financial and transaction advisory); Morrison Hershfield (transit O&M advisors); AGAT Labs; Comtech (program/project consulting); DECAST; RLB; Jacobs (program mgmt.); INTECH Risk Management; Arcadis (environmental services); Deloitte (financial advisor); Englobe; WSP (QA); HKA; INFRATA (managing consultant)

Legal: Borden Ladner Gervais (legal advisor); Torys (acted for lender); McMillan LLP (for the proponent)

Funding: Public

Substantial Completion: 2024

The Hurontario Light Rail Transit (LRT) project will bring 18 kilometres of fast, reliable, rapid transit to the cities of Mississauga and Brampton along the Hurontario corridor. New, modern light rail vehicles will travel in a dedicated right-of-way and serve 19 stops with connections to GO Transit's Milton and Lakeshore West rail lines, Mississauga MiWay, Brampton Züm, and the Mississauga Transitway BRT. Funded through a $1.4 billion commitment from the Province of Ontario, the Hurontario LRT is a signature project of the Moving Ontario Forward plan.

Early works on the Hurontario LRT project continue, with utility relocations including new watermains, as well as road widening and bus platform relocations—all tasks to prepare for rail and station construction. Plus, excavation for the push box at Port Credit is underway. In addition, the operations, maintenance and storage facility under construction is making progress; and prep work for the installation of track is underway beside the facility.

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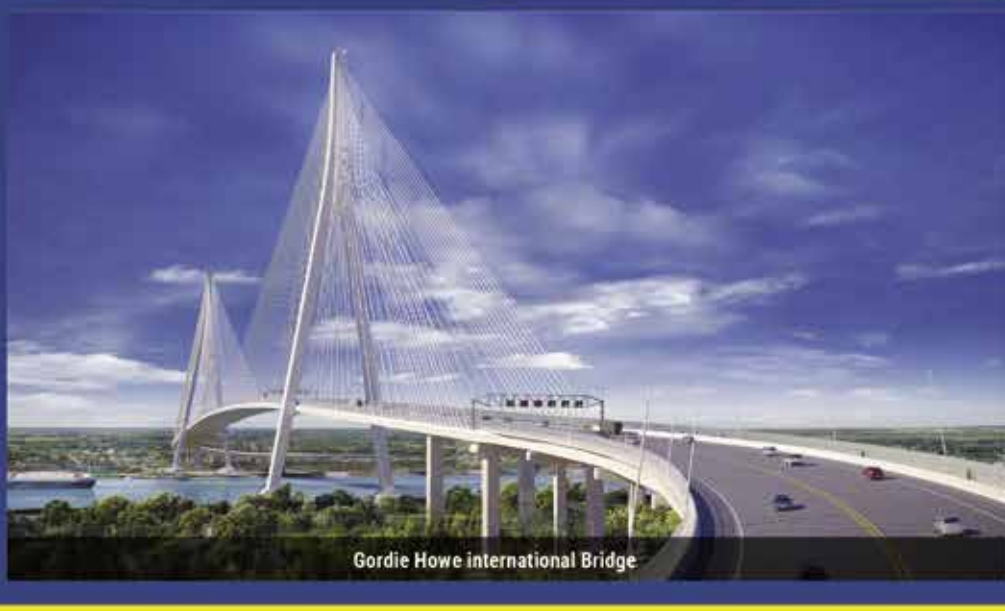

Gordie Howe international Bridge

ACS Infrastructure Canada, Inc. | GRUPOACS.COM | Dragados Canda, inc.

Photos: Metrolinx

14 Scarborough Subway Extension

$5.5 billion

2021 Rank: 21

Location: Scarborough, Ontario

Owner: Metrolinx

DBF Team (Advance Tunnel contract): Strabag Scarborough Project Inc.
- Construction Team: Strabag Inc.
- Design Team: ARUP Canada Inc., Brian Isherwood & Associates Ltd.
- Financial Advisor: Strabag Inc.

Engineer: OneT+ (Gannett Fleming, IBI Group); Wood (consulting)

Design: Hatch (tunnel design); WSP (systems design and management); AECOM (station design); Environmental Services: WSP (environmental lead)

Other Key Players: Golder (owner's consultant); Jacobs (quality mgmt. and risk assessment); Comtech WSP (Metrolinx Owner's Representative); INFRATA (managing consultant)

Funding: P3

Substantial Completion: 2026

The Scarborough Subway Extension is a 7.8 kilometre extension of TTC's Line 2 Bloor-Danforth Subway, from the existing Kennedy Station northeast to McCowan Road/Sheppard Avenue. The line will include three new stations at Lawrence Avenue and McCowan Road, Scarborough Centre and a terminal station at McCowan Road and Sheppard Avenue. The project is being delivered in main packages of work: the Advance Tunnel project awarded in May 2021 to Strabag and the Stations, Rail and Systems (SRS) package. Construction for the Scarborough Subway Extension began in the fall of 2021at the corner of Sheppard Avenue and McCowan Road as crews excavated for the launch shaft where the tunnel boring machine will go into the ground to start digging. The shaft will be about 80 metres long, 30 metres wide, and 25 metres deep. For comparison, a standard Olympic-sized swimming pool is about 50 metres long, 25 metres wide, and 2 metres deep.

15 Green Line LRT

$4.9 billion

2021 Rank: 14

Location: Calgary, Alberta

Owner: City of Calgary

Engineer: Hatch; Wood (consulting); Tetra Tech (design)

Architect: Sturgess Architecture, IBI Group (consulting)

Other Key Players: Colliers Project Leaders; CIMA+; RLB; A.W. Hooker Associates Ltd. (cost consultant); INTECH Risk Management; Deloitte (pre-procurement assessment); Aon (risk advisor)

Legal: Blake, Cassels & Graydon (advising the City of Calgary); Borden Ladner Gervais

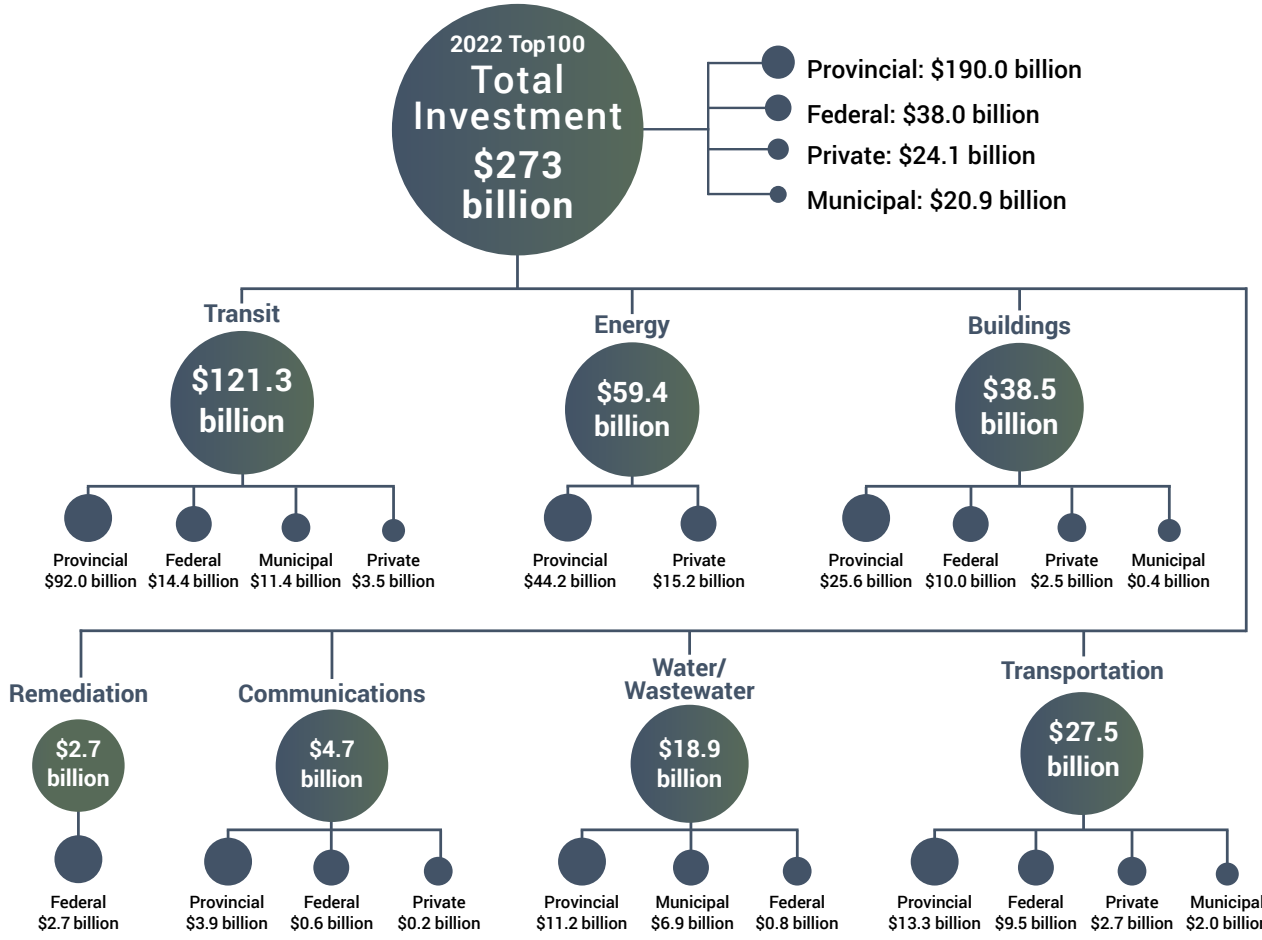
Funding: Public
- **Federal:** $1.64 billion
- **Provincial:** $1.7 billion
- **Municipal:** $1.56 billion

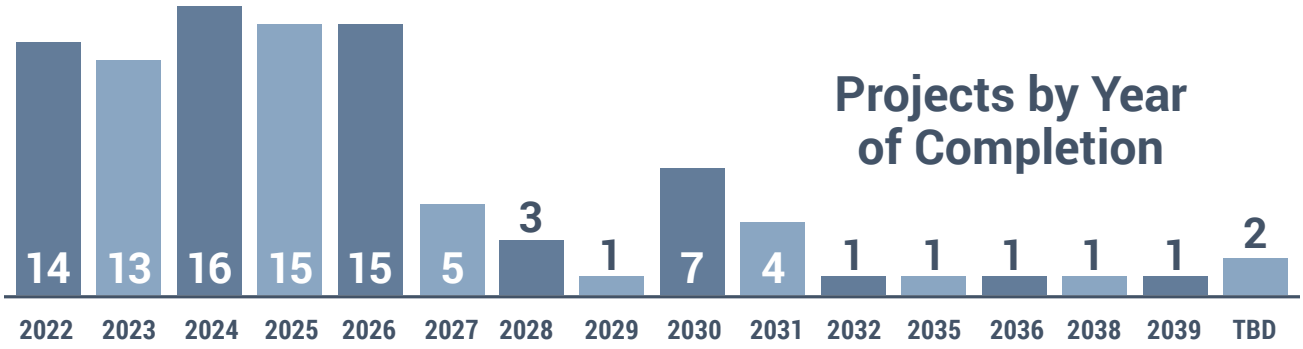
Substantial Completion: 2027

The Green Line Light Rail Transit system will add 28 stations and 46 kilometres of track to Calgary's existing LRT system. The line will run from 16th Avenue north to 126 Avenue SE, with an underground tunnel for the downtown portion of the system. The initial plans were for the Green Line to be constructed as a bus-only transitway, but was later converted to LRT as funding became available.

Since spring 2021 Green Line announced significant milestones for the project:

- The Alberta Provincial government completed a significant review of the project and announced their support for the Green Line LRT project with a revised procurement strategy. The Green Line will be built in two phases in a stage-gated approach, with the first phase building the LRT from Shepard to Eau Claire.
- On June 7, announcements were made by the Government of Canada and the Province of Alberta to reaffirm their support of the Green Line LRT project. Together with The City of Calgary, this secured the $4.9 billion funding committed by the three levels of government to bring the project to fruition.
- Green Line announced the start of the Beltline and Downtown Utility Relocation Project. This essential advanced work project will make way for the Green Line tunnel downtown by relocating underground utilities that would conflict with main construction. Work began in fall 2021 and is expected to continue through 2023.
- Updated Functional Plans for Green Line alignment, stations and bridges between the Elbow River and 16 Avenue N. were presented to the Green Line Committee and approved on May 19.





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20 projects or more	10 to 19 projects	6 to 9 projects	3 to 5 projects	2 projects

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16 Parliamentary Precinct Rehabilitation Project

$4.7 billion

2021 Rank: 16

Location: Ottawa, Ontario

Owner: Government of Canada

Project/ Construction Manager: PCL/ EllisDon (West Block); PCL/EllisDon JV (Centre Block)

Architect: Arcop (WSP)/Fournier Gersovitz Moss & Associates (West Block)

Other Key Players: Turner & Townsend (risk management services); Colliers Project Leaders Inc. and Tiree Facility Solutions (project management support services for Centre Block); Atwell-Morin (northern ventilation towers rehabilitation for Centre Block); Golder; Morrison Hershfield (code consulting); Engineering Harmonics; EY (business case advisor); Aon (risk advisor); Kasian, Moriyama & Teshima Architects (West Memorial Building architectural and interior design); Hanscomb (cost consultant); NORR Architects, DIALOG, Dillon Consulting (Long-term Vision Plan)

Funding: Public

Substantial Completion: 2030

The Government of Canada is undertaking an extensive rehabilitation of the Parliament Buildings in Ottawa. The West Block and Centre Block will all undergo intensive interior and exterior upgrades throughout the buildings, and extensive work is also being done on the building grounds and support structures.

The West Block, the first scheduled for completion, has included repairs to the exterior masonry, replacement of electrical, mechanical, and life-safety systems, asbestos abatement, window and door replacement, structural reinforcement, and technology upgrades to modern standards.

In June 2021, Public Services and Procurement Canada (PSPC) released the final design, scope, and anticipated timelines for completing the project, saying that the current estimate is that it will cost between $4.5 billion and $5 billion.

Citing the ongoing risk of unforeseen complications, PSPC said that the "major construction" is anticipated to be completed within the 2030-31 year. Though, it could be another year before officials can move back in because "significant" testing will be needed to make sure the chambers and committee rooms are ready to be used, once the renovation is complete.

To date, the Treasury Board has approved an investment of $4.7 billion dollars for the delivery of the Long Term Vision and Plan for the Parliamentary Precinct, of which $3 billion was spent as of March 31, 2018. Included within the approved funding are major projects such as the rehabilitation of the West Block, Visitor Welcome Centre Phase 1, Government Conference Centre, Sir John A Macdonald Building, the Wellington Building, along with the initial spending authority for the rehabilitation of the Centre Block, the East Block, 100 Wellington, and funding for other projects in the Parliamentary Precinct.

17 Eglinton Crosstown West Extension

$4.7 billion

2021 Rank: 17

Location: Toronto, Ontario

Owner: Metrolinx

Project Manager: Infrastructure Ontario

DBF Team (Advance tunnel contract): West End Connectors

- Applicant Lead: Aecon Infrastructure Management Incl, Dragados Canada Inc., Ghella Canada Ltd.
- Construction Team: Aecon Infrastructure Management Inc., Dragados Canada Inc., Ghella Canada Ltd.
- Design: TYPSA Inc., EXP Services Inc., Dr. G. Sauer & Partners Corporation, Pedelta Canada Inc.
- Financial Advisor: ACS Infrastructure Canada, Aecon Concessions, Scotiabank Capital, Ghella Investments & Partnerships

Engineer: ARUP Canada Inc.; LEA (engineer design); Morrison Hershfield (consulting)

Environmental Services: WSP (environmental lead)

Other Key Players: Golder (geotechnical studies); Jacobs (document control, contract administration, schedule, quality mgmt. and risk assessment); WSP (TTC Operators Representative); INFRATA (managing consultant)

Supplier: DECAST

Funding: P3

- **Federal:** $1 billion
- **Provincial:** $1.7 billion
- **Municipal:** $1.56 billion

Substantial Completion: 2030-2031

Credit: Metrolinx

The Eglinton Crosstown West Extension is an approximately 9.2 kilometre extension of the Eglinton Crosstown LRT (future Line 5), from Mount Dennis to Renforth Drive. Metrolinx is actively collaborating with the GTAA and municipal partners on the proposed alignment from Renforth Drive to the airport, which takes into account the GTAA's plans for a Regional Transit Centre. Tunnelling is one of the first phases of work for the project. A separate advance tunneling contract will be issued to help move the project forward on an accelerated timeline.

The project is being delivered in two separate P3 contracts, although the type of P3 has yet to be determined:

- Advance Tunnelling contract awarded to West End Connectors in May 2021
- Stations and remaining works (procurement dates TBD)

Photos: City of Ottawa

18 Ottawa LRT – Stage 2

$4.675 billion

2021 Rank: 18

Location: Ottawa, Ontario

Owner: City of Ottawa

Engineer: STV Group, AECOM, Parsons and Morrison Hershfield (owner's engineer); Kiewit, Vinci, WSP, and Hatch (Confederation Line design build); SNC-Lavalin (Trillium Line design build maintain); EXP

Environmental Services: WSP (environmental lead)

Other Key Players: Rideau Transit Maintenance (Confederation Line maintainer); Aon (owner's advisor and construction insurance broker); Deloitte (owner's advisor); A.W. Hooker Associates Ltd. (Independent Certifier); SENER (Independent Safety Auditor); INFRATA (managing consultant)

Supplier: Thales (Confederation Line signaling technology); Siemens (Trillium Line signaling technology); Alstom (Confederation Line vehicles); Stadler (Trillium Line vehicles)

Legal: Borden Ladner Gervais (owner's legal advisor); Norton Rose Fulbright (owner's legal advisor)

Funding: P3

- **Federal:** $1 billion
- **Provincial:** $1.208 billion
- **Municipal:** $2.449 billion

Substantial Completion: 2025

The Stage 2 Light Rail project will provide the foundation for the National Capital Region's growth and evolution through the twenty-first century. Stage 2, when complete, will extend the O-Train system farther south, east, and west, adding approximately 44 kilometres of new rail and 24 new stations. With the completion of Stage 2, 77 per cent of Ottawa residents will live within five kilometres of fast, efficient, clean and reliable light rail service. The system will be able to carry up to 24,000 customers per hour, per direction during peak periods to, from and through Ottawa's downtown core.

Stage 2 is a package of three extensions – south, east, and west.

- The O-Train South extension will see rail service continue from Greenboro to Limebank in Riverside South, while adding a link to the Ottawa Macdonald-Cartier International Airport.
- The O-Train East extension will see LRT continue from Blair to Place d'Orléans Station, and then all the way to Trim Road
- The O-Train West extension will see LRT continue from Tunney's Pasture to Moodie and Baseline Stations.

In October 2020, tunnelling began on the three-kilometre Parkway tunnel, which will run between Kìchì Sìbì Station and Lincoln Fields Station underneath the Sir John A. Macdonald Parkway and Byron Linear Park.

19 Montreal Metro Blue Line East Extension

$4.462 billion

2021 Rank: 19

Location: Montreal, Quebec

Owner: Société de transport de Montréal

Project Manager: ARTM

Engineer: EXP (JV for engineering services); Tetra Tech (owner's engineer)

Other Key Players: AECOM; EY (business case advisor); Englobe

Funding: Public

Substantial Completion: 2026

The Blue Line Extenson project will add 5.8-kilometres of track and five new stations to the current 12-station Blue Line, one of four Metro lines that runs through the Greater Montreal Area. The extension will run along Jean-Talon Street, ending at the Galeries D'Anjou shopping mall next to Highway 25. In 2019, funding support from the federal government was announced, with one-third of the proposed project price ($1.3 billion) allocated. However, two months earlier it was reported that the cost of the project could escalate by $600 million, to $4.5 billion, based on increased expropriation and tax bill costs. This is incorrect. The cost of the approved project was 4.462 billion. The "based on increased expropriation" increases subsequently occurred, which was one of the causes of the ongoing cost and scope review. In 2022, the project business plan is expected to approved, along with procurement of the tunnel boring and work is expected to start in the fall.

Credit: Infrastructure BC

20 George Massey Tunnel Replacement

$4.15 billion

NEW

Location: Vancouver, British Columbia

Owner: Province of B.C. (TI CORP is leading the delivery of the project on behalf of the Ministry of Transportation and Infrastructure)

Engineer: COWI (planning); Wood (consulting)

Funding: Public

Substantial Completion: 2030

The Ministry of Transportation and Infrastructure announced on August 18, 2021 that a new, eight-lane immersed tube tunnel (ITT) will replace the existing George Massey Tunnel on Highway 99, providing people a toll-free crossing that aligns with regional interests and an active transportation connection across the Fraser River. Improvements to the highway corridor near the crossing will begin later this year. The new eight-lane tunnel will be in operation in 2030, with the cost estimated to be $4.15 billion. In the interim, The Province previously announced on June 22, 2021 that it is taking action to reduce traffic congestion and improve transit and cycling infrastructure along the Highway 99 corridor including the replacement of the Steveston Interchange. More information on corridor improvements. Transportation Investment Corporation will lead the delivery of the George Massey Crossing Project on behalf of the Ministry of Transportation and Infrastructure, and will provide the controls, practices and other oversight essential for this complex project.

21 Surrey Langley SkyTrain Project

$3.95 billion

2021 Rank: 39

Location: Surrey, British Columbia

Owner: Province of British Columbia

Contractor: TBD

Engineer: Hatch (lead engineer); COWI

Other Key Players: Deloitte; Golder; McElhanney Consulting Services; Hemmera; Charter; Morrison Hershfield (early works)

Legal: Norton Rose Fulbright

Funding: Public

Substantial Completion: 2028

The Surrey Langley SkyTrain project is a 16-kilometre extension of the Expo Line from King George SkyTrain Station along Fraser Highway to Langley City Centre, with eight new stations. The estimated cost of the 16-km extension is now $3.95 billion. The original plan for the Surrey Langley SkyTrain project was to build this project in two phases, based on available funding. In 2020, the BC government assumed responsibility for the project from TransLink and committed to deliver a full 16-km extension in one stage. In July 2021, the federal government announced up to $1.3 billion in federal funding.

22 Ontario Connects

$3.889 billion

NEW

Location: Province of Ontario

Owner: Ontario Ministry of Infrastructure

Procurement/ Project Manager: Infrastructure Ontario

Other Key Players: Ernst & Young LLP; Planview Utility Services Ltd.; Black & Veatch; Theory + Practice; KPMG LLP; Optimus SBR Inc.; Conboy Advisory Services Inc.; JTS Consulting Inc.

Funding: Public

Substantial Completion: 2025

The Government of Ontario has committed nearly $4 billion to connect every region in Ontario to reliable, high-speed internet by the end of 2025. This is the largest single investment in high-speed internet, in any province, by any government in Canadian history. This investment will help ensure that every household and business, in every community, has access to the digital world. To connect the remaining underserved and unserved communities across the province, Infrastructure Ontario is leading a new, innovative procurement process that started in summer 2021. This transparent and competitive process will enable Internet Service Providers (ISPs) to bid for provincial subsidies through a series of reverse auction events for defined geographic areas and based upon requirements for high-speed internet infrastructure deployment.

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CANADA BEST MANAGED COMPANIES

Top100 Projects GOLD 2022

Photos: Metrolinx

23 Finch West LRT

$3.433 billion

2021 Rank: 22

Location: Toronto, Ontario

Owner: Metrolinx

Procurement Agent: Infrastructure Ontario

DBFM Team: Mosaic Transit Partners–ACS Infrastructure Canada Inc.; Aecon ConcessionsCRH Canada Group Inc.

- Construction: Aecon Infrastructure and Management Inc.; Dragados Canada Inc.; Dufferin Construction Company—a division of CRH Canada Group Inc.
- Design: Arup Canada Inc.; Dillon Consulting Limited; DPM Energy Inc.; DTAH; Perkins + Will Canada Inc.; Sener SES Canada Inc.
- Maintenance: ACS Infrastructure Canada Inc.; Aecon O&M—a division of Aecon Construction Group Inc.

Engineer: Jacobs (owner's engineer and project manager); WSP (engineer/sustainability consultant); Hatch (owner's engineer); LEA (engineer design); EXP

Other Key Players: AECOM (technical advisor); Aon (risk/insurance advisor to authority); EY (advising gov't.); LeighFisher (lenders technical advisor); Parsons (overseeing technical advisor); INTECH Risk Management (insurance advisor); Morrison Hershfield (MEP design services); GHD (traffic mgmt.); Golder; Comtech (program/project consulting); Rider Levett Bucknall; Englobe; A. W. Hooker Associates Ltd. (cost consultant); Deloitte (mgmt. consultant); Entuitive; HKA; INFRATA (managing consultant)

Supplier: Bombardier (vehicles); Dufferin Concrete; DECAST (precast infrastructure)

Financial Advisor: RBC Dominion Securities Inc.

Legal: Norton Rose Fulbright; McMillan LLP (for the lender)

Funding: P3

Substantial Completion: 2023

This new LRT, located along Finch Avenue West in the city's northwest end, will be integrated with the city's existing transit system. The project includes 11 kilometres of new semi-dedicated rapid transit between Humber College and the new Finch West subway station on the Toronto-York Spadina subway extension; 18 surface stops and a below-grade interchange station to connect with the new Finch West subway station; and a maintenance and storage facility for the light rail vehicles. Construction is making progress throughout the Finch West LRT project, including road widening, continued utility relocations and upgrades, and excavating the underground interchange station at Finch West Subway Station. In summer 2021, the first light rail vehicle arrived at the Finch West Maintenance and Storage Facility.

24 Hamilton LRT

$3.4 billion

NEW

Location: Hamilton, Ontario

Owner: Metrolinx

Procurement Agent: Infrastructure Ontario

Funding: Public

- **Federal:** $1.7 billion
- **Provincial:** $1.7 billion

Substantial Completion: 2025

In September 2021, Hamilton City Council voted to reinitiate the project after it was previously cancelled by the province in 2019 due to rising costs. The LRT, as proposed, would bring 14 kilometres of rapid transit to Ontario's fifth-largest city. Funding was originally set aside for the project back in 2015 by the Government of Ontario, but after projected costs rose too high, the LRT was cancelled. Then in February of 2021, the province recommitted to the project, with the federal government agreeing to contribute $1.7 billion. Once complete, the new LRT line will connect McMaster University in the west to Eastgate in the East, with 17 stops planned on the route. In November 2021 it was announced that demolition of several Metrolinx-owned properties on the Hamilton light rail transit (LRT) corridor will begin in the coming months. In the coming years, these properties will be required for station stops, infrastructure, and widening to accommodate the future LRT right of way. In the short term, demolition sites will be restored, secured with fencing and monitored by security contractors.

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25 Don River and Central Waterfront & Connected Projects

$3 billion

2021 Rank: 31

Location: Toronto, Ontario

Owner: City of Toronto

Don River and Central Waterfront Wet Weather Flow System (DR&CW WWF System):

- Coxwell bypass (stage 1): Black & Veatch Canada (consultants); North Tunnel Constructors (contractor)
- Inner Harbour West Tunnel: Hatch/AECOM (consultant)
- Integrated Pumping Station (IPS): Black & Veatch Canada (consultants); Strabag Canada (contractor-contract 2)
- Ashbridges Bay Landform Project: (TRCA) Toronto and Region Conservation Authority (designer with Shoreplan Engineering); TRCA (constructor of landform)
- UV (Ultraviolet) Disinfection Facility: AECOM (consultants); Graham (contractor)
- Outfall: Hatch/Jacobs and Baird (consultants); (SAJV) Southland Astaldi Joint Venture (contractor)

Funding: Public **Substantial Completion:** 2038

The Don River and Central Waterfront Wet Wester Flow System & connected Projects is a 25-year program aimed at improving water quality in Toronto's Lower Don River, Taylor-Massey Creek, and the Inner Harbour. Toronto is embarking on the largest and most significant stormwater management program in the city's history. With an overall budget of more than $3 billion, this 25-year program will greatly improve the water quality in the Lower Don River, Taylor-Massey Creek and along Toronto's Inner Harbour by keeping combined sewer overflows out of our waterways through the upgrading of technology and capacity to capture, transport and treat it. The project is comprised of an integrated system of tunnels, storage shafts, a high-rate treatment facility and wastewater treatment plant upgrades. Construction began in 2018 and projected completion is 2038. The Program is made up of several individual projects that will work together, including the Don River and Central Waterfront Wet Weather Flow System, the Ashbridges Bay Treatment Plant (ABTP) Integrated Pumping Station, ABTP UV Disinfection facility, ABTP Landform and High-rate treatment facility and ABTP Outfall. Construction of the Coxwell Bypass Tunnel is scheduled for completion in 2023. The Ashbridges Bay Landform Project, a joint initiative between the City and the Toronto Region Conservation Authority (TRCA), as well as projects at the Ashbridges Bay Treatment Plant (ABTP) are all well underway. These include the Integrated Pumping Station, the Landform Project, the ABTP UV Disinfection facility and the ABTP Outfall.

Photos: Walters Group

26 Energy Services Acquisition Program's Energy Service Modernization

$2.95 billion

2021 Rank: 23

Location: Ottawa, Ontario

Owner: Government of Canada

DBFOM Team: Innovate Energy—Black & McDonald Capital Limited; Black & McDonald Limited, ENGIE Services Inc. PCL Constructors Canada Inc., PCL Investments Canada Inc.; BBB Architects Ottawa/WSP (design partners)

Other Key Players: EY (oversight advisor); Aon (risk advisor)

Legal: Norton Rose Fulbright (advisor to project owner)

Funding: Public

Substantial Completion: 2025

Public Works and Government Services Canada (PWGSC) is responsible for heating and cooling services for 80 and 67 buildings respectively within the National Capital Region (NCR). The Energy Services Acquisition Program was established in 2009 to "explore new business models for the provision of energy services in the NCR." The modernization project looks for an energy services solution for PWGSC's five Central Heating and Cooling Plants (CHCP) and their associated distribution networks within the four National Capital region service areas, three of which are in Ottawa and one in Gatineau. The five CHCP's service 79 total buildings. Innovate Energy was announced as the successful proponent in June 2019. The contract includes a $1.1 billion investment for the design and construction of the new system, to be completed by 2025, and an additional $1.6 billion will cover the cost of operation and maintenance of the system through to 2055.

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Top100 Projects
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27 Broadway Subway Extension

$2.83 billion

2021 Rank: 24

Location: Vancouver, British Columbia

Owner: Province of British Columbia (The Transportation Investment Corporation is leading the delivery of the project on behalf of the Ministry of Transportation and Infrastructure)

Owner: Province of British Columbia (The Transportation Investment Corporation is leading the delivery of the project on behalf of the Ministry of Transportation and Infrastructure)

DBF Team: The Broadway Subway Project Corporation – A joint venture of Acciona Infrastructure Canada Inc. and Ghella Canada Ltd.

Other Key Players: IBI Professional Services (Canada) Inc. / DIALOG BC Architecture Engineering Interior Design Planning Inc. / Mott MacDonald Canada Ltd. / Parsons Inc / Norland / BD Hall Golder; McElhanney (assessment and surveying services); Aon (risk advisor); Hanscomb (cost consultant); Morrison Hershfield (early works)

Photos: Province of B.C.>

Funding: Public
- **Federal:** $896.9 million
- **Provincial:** $1.83 billion
- **Municipal:** City of Vancouver: $99.8 million (in-kind land contribution)

Substantial Completion: 2025

The Broadway Subway Project will see the addition of six underground stations and 5.7 kilometres of track to the Millennium Line. The extension will run from VCC-Clark Station to Arbutus Street; 700 metres will be elevated guideway and the remainder will be tunneled. The line will replace the existing B-line bus service, gaining the capacity to move three times as many people through the corridor. In September 2020, the Broadway Subway Project Corporation, an Acciona-Ghella joint venture, was announced as the contractor to design, build, and partially-finance the project at a value of $1.728 billion and began site preparation before the end of 2020. The province undertook early work to relocate trolley buses and some utilities beginning in 2019. Construction began in May 2021 and includes: Completion of building demolitions; Utility relocations continue across the alignment; Public consultation on stations designs; Began building traffic decks to maintain traffic flow during construction of the underground portions of the new stations.

28 Ottawa Civic Hospital

$2.8 billion

NEW

Location: Ottawa, Ontario

Owner: The Ottawa Hospital

Development Advisory/Project Management: GBA Group

Strategic Finance Planning Services: Deloitte

Architectural Services: HDR Architecture Associates, Inc.

Master Programmer: Agnew Peckham Health Care Consultants

Funding: Public

Substantial Completion: 2028

When it opens in 2028, the Ottawa Hospital's new Civic development will be a state-of-the-art facility on Carling Avenue near Dow's Lake that will serve Ottawa, Eastern Ontario, Western Quebec and Nunavut. The new hospital will feature highly specialized inpatient, outpatient, emergency, and trauma services, treating the most complex adult injuries and illnesses. This world-class centre for academic training and medical research will be networked with partners in Ontario, across Canada, and around the world. In the spring of 2021, The Ottawa Hospital was pleased submit Stage 2 of the Ontario Capital Planning Process for its new Civic development to the Ontario Ministry of Health. As part of this submission, the hospital then shared with the public the proposed design of the cutting-edge new campus that will be situated near Dow's Lake at the foot of Ottawa's Rideau Canal.

29 Montreal Metro AZUR Car Purchase and Replacement

$2.703 billion

2021 Rank: 25

Location: Montreal, Quebec

Owner: Société de transport de Montréal (STM)

Supplier: Bombardier, Alstom (joint-venture supplier)

Funding: Public

Substantial Completion: 2022

The Société de transport de Montréal, with support from the Government of Québec, continues to invest in the replacement of new AZUR métro cars for the Montréal transit network. To date, 68 of 71 AZUR trains have been delivered to STM. As part of the 2018 announcement, the Government of Canada provided an investment of over $215 million. The remaining part of this additional fleet upgrade, over $580 million, is being provided by STM and the Government of Quebec. The project includes the acquisition of 71 Azur trains (639 metro cars total), maintenance depot refurbishing and recycling of 44 old trains (396 metro cars).

Credit: STM

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30 Valley Line West LRT

$2.4 billion

2021 Rank: 27

Location: Edmonton, Alberta

Owner: City of Edmonton

DB(F) Team: Marigold Infrastructure Partners—Colas, Parsons, Standard General, Francl Architecture, Fast & Epp, Stantec

Engineer: connectEd Transit Partnership: AECOM (owner); Hatch; Mott MacDonald; DIALOG; ISL Engineering and Land Services; SMA Consulting; reVerb Communications; Hanscomb

Other Key Players: EY (financial advisor); Aon (risk advisor); Golder (geotechnical studies); Morrison Hershfield, AW Hooker, Northstar Consultancy; INFRATA (managing consultant)

Funding: P3

- **Federal** $948.56 million
- **Provincial** $1.04 billion
- **Municipal** $637 million

Substantial Completion: 2026

The Valley Line West LRT project is the next phase of Edmonton's light rail expansion. This project represents a 14-kilometre extension of the existing system from downtown to Lewis Farms in west Edmonton. Marigold Infrastructure Partners started construction in 2021. The group of companies has focused on detailed design and early work, including geotechnical investigations, ongoing utility works, and preparing areas of the alignment for upcoming construction. The procurement process to supply light rail vehicles (LRVs) for the project continued in 2021. The City was expected to select and announce the successful supplier of LRVs in late 2021.

31 New Hospital for Sick Children

$2.4 billion

2021 Rank: 27

Location: Toronto, Ontario

Owner: Hospital for Sick Children

Patient Support Care Project Team: Construction Manager: PCL Constructors Canada Inc.; Architect: B+H Architects (only for the Patient Support Centre); Structural Consultant: Entuitive; Electrical Consultant: Mulvey & Banani; Mechanical Consultant: The Mitchell Partnership; Demolition: Priestly Demolition

Peter Gilgan Family Patient Care Tower-Stage 2 Functional Program: Design Team: Stantec/KPMG joint venture; Functional Programmer: RPG; Engineer: WSP (electrical)

Other Key Players: Hanscomb (cost consultant); EY (mgmt. consultant)

Engineer: WSP (planning)

Legal: Borden Ladner Gervais, McMillan LLP (for the owner)

Funding: Public

Substantial Completion: 2035

Dubbed 'Project Horizon' by SickKids, the three-phase project to rebuild and rehabilitate The Hospital for Sick Children in Toronto is well underway. There are three phases to the project, which are expected to take a total of 15 years to complete: A new 22-storey Patient Support Centre; The Peter Gilgan Family Patient Care Tower; and Renovations to the existing campus. In June 2020, work began on laying the foundation for the Patient Support Centre, which is scheduled for completion in the summer of 2023. The Patient Care Tower is scheduled for completion in 2029, followed by the completion of the Peter Gilgan Family Patient Care Tower in 2035.

32 F.G. Gardiner Expressway Strategic Rehabilitation Plan

$2.3 billion

2021 Rank: 28

Location: Toronto, Ontario

Owner: City of Toronto

Contractor: Aecon (Section 1)

Engineer: Morrison Hershfield (baseline study of substructure components)

Environmental Services: Dillon Consulting Limited (environmental assessment); Perkins+Will; Hargreaves Associates

Other Key Players: EY, Hanscomb, and HDR (advisory support); Aon (risk advisor); WSP (design work); Englobe, Entuitive; HKA

Supplier: Canam Group

Legal: Blake, Cassels & Graydon (City of Toronto); Osler

Funding: Public

Substantial Completion: 2030

Photos: Rick Raedel/City of Toronto

The City of Toronto is taking a proactive approach to managing the rehabilitation of the Gardiner to keep the roadway in safe and operable condition. City staff have evaluated the procurement options and are recommending an AFP approach to rehabilitate the Gardiner in the most efficient way for Toronto residents and businesses. The proposed plan addresses the rehabilitation of the expressway, extending from Highway 427 to the eastern limit at Logan Avenue, including the 11-kilometre at-grade section from Highway 427 to Dufferin Street with its 32 bridges and structures, and the seven-kilometre elevated section from Dufferin Street to Logan Avenue with 335 spans. It incorporates the change of scope for the rehabilitation of the Gardiner Expressway east of Jarvis Street based on the future outcome of the environmental assessment. In 2021, the City of Toronto achieved a significant construction milestone by completing the rehabilitation of the elevated section of the Gardiner Expressway between Jarvis and Cherry Streets with traffic resuming on all lanes in mid-April. To complete this work faster and to be less disruptive to the public, the City used an innovative construction technique called Accelerated Bridge Construction to replace concrete deck and steel girder sections on the elevated portion of the Expressway with prefabricated concrete deck panels. During this project, the largest of its scale in North America, sections of the Expressway were saw cut, hoisted out of place and transported elsewhere to separate and recycle the concrete deck and steel girders.

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33 Réno-Systèmes – Phases 1, 3, 4 & 5

$2.242 billion

2021 Rank: 78

Location: Montreal, Quebec

Owner: Société de transport de Montréal (STM)

Engineer: Stantec

Other Key Players: Bairn Architecture et Design; Englobe (quality management services); WSP (independent certifier)

Funding: Public

Substantial Completion: 2023-2026

Credit: STM

In the fall of 2014, the board of directors of Société de transport de Montréal (STM) announced that it would invest $582.5 million in the replacement of metro stationary equipment in phase 4 of its Réno-Systèmes program. Construction of the backup control centre building began in August 2021. The Fullum and Towers mechanical ventilation stations are complete and refurbishment of the Lionel-Groulx power station continues as does work on Line 5 to replace the radio-communication system.

Phase 1 ($359.1 million)—the accessibility program strives to improve the physical accessibility of the STM's infrastructures, facilitate vertical movements, strengthen customer loyalty and improve customer service. The accessibility projects (elevator installation) at seven metro stations should be completed during 2022: Préfontaine, Villa-Maria, Place-des-Arts, Édouard-Montpetit, Angrignon, Jolicoeur and McGill.

Phase 3 ($500 million) objectives are to maintain the integrity of the facilities, improve accessibility and customer safety, optimize investments over time and organize funding so that it is available at the right time to carry out the work. Moreover, infrastructure improvements are undertaken with minimal inconvenience to customers. The planned work will target stations and their artworks, entrances, auxiliary structures, tunnels, garages and workshops.

Phase 5 ($800 million) serves to replace and refurbish the metro's stationary equipment that has reached or exceeded the end of its useful life. The projects are grouped into five categories that outline the scope of the work planned for phase 5: energy; ventilation; motorized facilities, train control and telecommunications and operating process controls (TCPE).

34 St. Paul's Hospital

$2.2 billion

2021 Rank: 36

Location: Vancouver, British Columbia

Owner: Providence Health Care/ Vancouver Coastal Health

DB (F): PCL Construction

Engineer: Tetra Tech (geotechnical design)

Other Key Players: IBI Group (early design works); KPMG (clinical planning services); Entuitive; EY (mgmt. consultant); McElhanney (site surveyor)

Funding: Public/Private

- **Provincial:** $1.327 billion
- **Private:** Providence Health Care $850 million (from sale of existing hospital site); St. Paul's Foundation $225 million

Substantial Completion: 2027

Credit: Providence Health Care

In February 2019, the Government of British Columbia approved the business plan for a new St. Paul's Hospital in downtown Vancouver. The new hospital will continue to serve as a an acute-care hospital and integrated health campus. The new facility will be expanded to a capacity of 548 beds, which represents 115 net new beds, and "will be the home of several leading provincial programs and referral centres, including for heart and lung care, renal, eating disorders and specialty surgeries and transplants," according to a government release. It will also be a teaching hospital for both University of British Columbia medical students and British Columbia Institute of Technology nursing students. The project will be done in two phases, with phase 1 consisting of the new core hospital and phase two is expected to include a clinical support and research centre.

35 Ville-Marie and Viger Tunnels

$2 billion

2021 Rank: 29

Location: Montréal, Quebec

Owner: MTQ

Engineer: AECOM (design)

Other Key Players: WSP (construction supervision services)

Funding: Public

Substantial Completion: 2030

The Ville-Marie and Viger tunnels are integral parts of the Montreal transportation network. The two tunnels are located in the axis of Autoroute 720 along a stretch commonly referred to as the Ville-Marie highway. The Ville-Marie tunnel was inaugurated in 1974, followed by the Viger in 1986.

From the MTQ: "The tunnels crisscross a densely built environment, both on the surface and in depth, since they coexist with underground Montreal where there are pedestrian tunnels, metro tunnels, commercial spaces and parking lots, not to mention the Ville- tunnel. Marie includes the only underground interchange in Quebec and one of the few in North America."

Renovation work on the tunnels will take part in four phases (anticipated work time in brackets): The replacement of 37 exhaust fans (three-and-a-half years); the complete repair of the tunnels at the exit from the Mountain, including the dismantling of the last paralumes (two years); the beginning of electrical migration work towards 25 kilovolts (two years); and the reconstruction of the decks of the Saint-Urbain and Saint-Laurent bridges (one and a half years).

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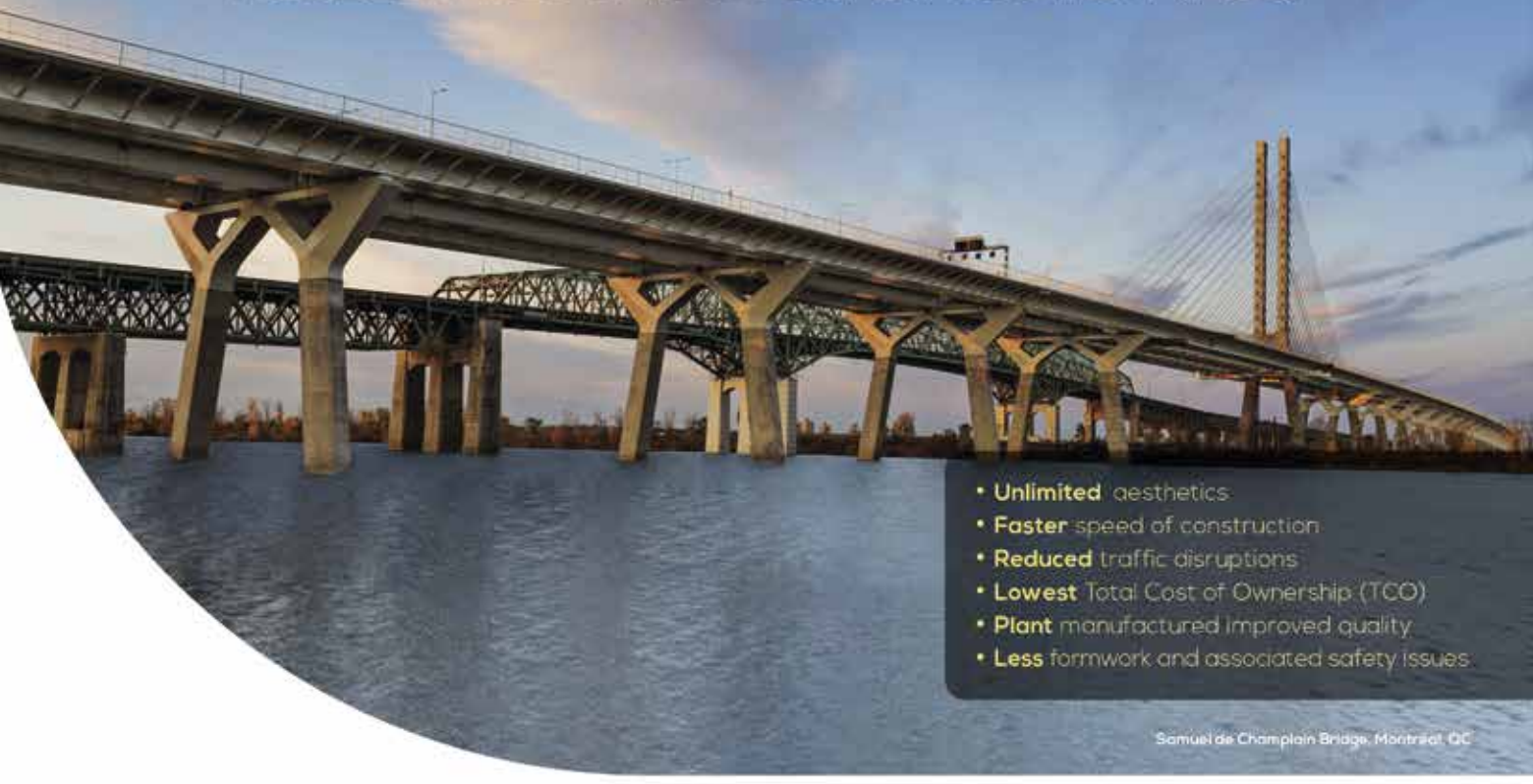

Owner: Infrastructure Canada | **Architect:** Arup Canada - Collaboration with Dissing+Weitling and Provencher Roy | **Engineer:** Stantec and Ramboll
Photo: BPDL, Alma, QC

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For more information on this project: http://www.cpci.ca/en/about_us/project_month/january_2020/

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36 81-141 Bay Street

$2 billion

2021 Rank: 30

Location: Toronto, Ontario

Owner: Metrolinx and Ivanhoé Cambridge

Project Manager: Hines (project development)

Contractor: EllisDon (general contractor)

Engineer: TMP (mechanical); Wood (consulting)

Architect: Wilkinson Eyre Architects (design); Adamson Associates; HKA Architects (executive architect); DBOX

Other Key Players: Arup (pedestrian modelling); INTECH Risk Management (advisor to developers); KPMG (advisor to Metrolinx for initial planning stage); Morrison Hershfield (building envelope consultant); WSP (sustainability consultants, geotechnical/environmental work); Cushman & Wakefield

Legal: Torys (representing project owner)

Funding: Public/Private (being delivered as part of GO Expansion-Early Works program)

Substantial Completion: 2023

Credit: Sierra Curtis/Metrolinx

The Bay Street project (CIBC Square) involves the construction of two new commercial buildings, joined by a one-acre elevated park over the rail corridor near Union Station in downtown Toronto. A key compnent of the construction is the new Union Station Bus Terminal. Construction got underway on the terminal in June of 2017. The terminal will provide stronger connections for users of the rail and bus networks, and provide straightforward access to the Gardiner Expressway. The new terminal also includes over 1,000 bicycle parking spots and integrated green space.The south tower continued its ascent to the top throughout 2019, and the building's curtainwall glazing is being installed. In March 2020, a modified site plan for the second building, 141 Bay Street, which will include accommodation for the potential future LRT along the Bay Street corridor. The new Union Station Bus Terminal was delivered by Metrolinx as part of the GO Expansion Early Works program.

37 QEII New Generation Project

$2 billion

2021 Rank: 32

Location: Halifax, Nova Scotia and surrounding communities

Owner: Government of Nova Scotia

Project Manager: Nova Scotia Lands

DBFM Contract (Bayers Lake Community Outpatient Centre)
EllisDon Infrastructure HealthCare

- P3 Electrical Design Team: Mulvey & Banani International Inc./ Dillon Consulting Limited, led by Plan-Group/Cahill.
- P3 Mechanical Design Team: HHA/Dillon Consulting Limited, led by Plan-Group/Cahill.

Contractor: PCL Constructors Canada Ltd. (Hants Community Hospital renovation)

Other Key Players: Contracting Specialties (2005) Inc.; Coastal Woodworkers Ltd.; Dantra Specialty Products; Duron Atlantic Limited; Twin City Painting (1979) Limited; Northfield Glass Group Ltd.; Apex Industries; Atlantica Mechanical; Bond and Coolen Contracting Ltd.; Life Safety Systems; RKO Steel Ltd.; Southeast Drywall Ltd.; Inflector Environmental Services; Darim Masonry Limited; Flynn Canada Limited; McCarthy's Roofing Limited; Royal Door Limited; Kasian (planing and design compliance team); Deloitte (financial advisor); Hanscomb (cost consultant); LEA (engineer structural); EXP

Legal: Borden Ladner Gervais; Osler (for the proponent)

Funding: Public/P3

Substantial Completion: TBD

The redevelopment of the QEII Health Science Centre is a multi-phase project involving several health care sites throughout Halifax and the surrounding area. The project will transform health care delivery in Nova Scotia, providing modern services for patients throughout the province. The primarily project elements include: the renovation of Hants Community Hospital in Windsor; renovation of Dartmouth General Hospital; a new Community Outpatient Centre in Bayers Lake; expansion of the Halifax Infirmary site; a new hospice residence in Halifax; and movement of the QEII Cancer Centre to the new Infirmary site. Completion of these projects will result in the closure of Centennial, Dickson, and Victoria buildings on the QEII Victoria site in Halifax. In 2020, significant progress was made in the procurement of multiple projects as part of the expansion, including the awarding of the contract for the Bayers Lake Community Outpatient Centre.


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38 Roberts Bank Terminal 2 Project

$2 billion

2021 Rank: 33

Location: Delta, British Columbia

Owner: Port Metro Vancouver

Project/Construction Manager: Collings Johnston Inc. (program management), Hatch (project controls)

Engineer: Moffatt & Nichol (owner's engineer), Stantec (engineering and design)

Environmental Services: Hemmera, Golder, and Ecofish Research (environmental assessment and permitting)

Other Key Players: KPMG (procurement advisory), Hamburg Port Consultants (terminal operations)

Legal: Blake, Cassels & Graydon (counsel to owner); Fasken Martineau DuMoulin LLP (legal advisor)

Funding/Financing: Vancouver Fraser Port Authority is a financially self-sufficient corporation established by the Government of Canada in accordance with the *Canada Marine Act*. The Vancouver Fraser Port Authority is funding the initial planning and environmental assessment phase of the proposed project. The project will be funded by the port authority and private investment.

Substantial Completion: 2030+

Credit: Vancouver Fraser Port Authority

Roberts Bank Terminal 2 is a proposed new three-berth container terminal in Delta, British Columbia that would provide additional capacity of 2.4 million TEUs per year to ensure that Canada is able to meet trade plans and objectives through to the mid- to late-2030s. The project would be located approximately 5.5 kilometres offshore in deep, subtidal waters to minimize environmental effects. The new terminal would have a berth length of up to 1,300 metres, long enough for the mooring of three ships, and a width of up to 700 metres to support terminal components, such as a container storage yard and rail intermodal yard. The existing causeway would be widened to accommodate road and rail improvements, and the tug basin at existing Roberts Bank terminals would be expanded. As part of the environmental assessment process for the project, the Vancouver Fraser Port Authority submitted an environmental impact statement for the project to the Canadian Environmental Assessment Agency in March 2015. The port authority is responding to an information request made by the federal government and is hopeful that a decision on the project can be made soon after a response has been provided. The request for qualifications to begin the design-build procurement process will be issued after the government approves the project.

39 Quebec City University Hospital Centre – Laval University

$1.97 billion

2021 Rank: 34

Location: Quebec City, Quebec

Owner: CHU de Québec-Université Laval

Engineer: SNC-Lavalin (consortium), Tetra Tech (consortium), BPA (consortium): mechanical & electrical engineering; CIMA+; Stantec

Other Key Players: Englobe (geotechnical/environmental investigation, quality control); GHD (vibration monitoring); Golder; Deloitte

Funding: Public/Private

Substantial Completion: 2025

In April of 2017, the Government of Québec formally announced plans to move forward with the replacement of the Hôpital Enfant-Jésus de Québec (Hospital of the Child Jesus) in Québec City. The project will consolidate the research and clinical activities of L'Hôtel-Dieu de Québec on the site of the new hospital. The first phase of the multi-phase project includes the construction of the Integrated Cancer Centre, along with a new generator building, power plant, and parking.

40 Wataynikaneyap Transmission Project

$1.9 billion

2021 Rank: 35

Location: Northern Ontario

Owner: Wataynikaneyap Power

Contractor: EPC Contract: Valard

Engineer: Hatch (owner's engineer); Wood Group PLC (consulting)

Environmental Services: Golder (Phase 1 EA)

Other Key Players: PowerTel, Deutsche Bank (MOU for design, construction, and financial services); PwC (financial feasibility study and socioeconomic impact analysis); Arcadis Canada Inc. (Phase 2 routing study); EY (consultant); INTECH Risk Management; Englobe

Legal: Torys (legal advisor); McMillan LLP (for the federal government)

Funding: Public/Private

- **Federal:** $560 million
- **Provincial:** $1.34 billion (loan)

Substantial Completion: 2023

Wataynikaneyap Power is majority-owned by a partnership of 24 First Nations, in partnership with Fortis Inc. and other private investors, and regulated by the Ontario Energy Board. Wataynikaneyap Power will develop and operate the transmission facilities to connect 17 remote communities to the power grid and transition them away from diesel generation. The plan calls for a 1,800-kilometre transmission line broken into two phases: a 300-kilometre line to Pickle Lake ($200 million), and transmission lines to connect the communities north of Pickle Lake and Red Lake ($1.15 billion). On July 10, 2020 the project reached a key milestone, with the first structure erected in the Sioux Lookout area near Highway 516. Potential remote electrification is anticipated in 2022, with build-out to 2023.

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41 North End Sewage Treatment Upgrades

$1.854 billion

2021 Rank: 38

Location: Winnipeg, Manitoba

Owner: City of Winnipeg

Engineer: KGS Group (owner's advocate/consultant)—NEWPCC Power Supply Upgrade; AECOM (owner's advocate/consultant)—NEWPCC Upgrade: Headworks, Biosolids & Nutrient Removal Facilities; Wood (design)

Design Builder

- NEWPCC Power Supply Upgrade: Black & Macdonald
- NEWPCC Upgrade: Headwork Facilities: Red River Solutions (Aecon/Oscar Renda JV)

Other Key Players: Veolia; P1 Consulting Ltd.; KGS Group Ltd. (owner's advocate/consultant)

Legal: Blake, Cassels & Graydon

Funding: Public

- **Federal:** $116.111 million
- **Provincial:** $96.750 million
- **Municipal:** $1.641 billion

Substantial Completion: 2023

In February 2019, Winnipeg City Council approved a request to break the overall project into three separate capital projects: North End Sewage Treatment Plant Upgrades: Power Supply & Headworks Facilities - $408 million; North End Sewage Treatment Plant Upgrades: Biosolids Facilities - $553 million; and North End Sewage Treatment Plant Upgrades: Nutrient Removal Facilities - $828 million. In May 2021, Winnipeg City Council approved a budget amendment increase of $65 million for the North End Sewage Treatment Plant Upgrade: Power Supply & Headworks Facilities, for a revised project budget of $473 million. In July 2021, the City of Winnipeg awarded Red River Solutions a bid to conduct the Headworks Facilities Project at the North End Sewage Treatment Plan. The scope of work includes the design and construction of a new headworks facility that will include a raw sewage pump station, a micro-tunnel extension of existing interceptor sewers, a grit removal system, a main control room, fine screens and compactors, and a plant emergency generator facility. The project is the first of three projects for upgrading the NEWPCC. Construction is expected to commence in the third quarter of 2021, with expected completion in the second quarter of 2025.

42 Highway 1 Upgrades – Kamloops to Alberta

$1.7 billion

2021 Rank: 56

Location: Kamloops, B.C. to the Alberta border

Owner: B.C. Ministry of Transportation and Infrastructure

Project Manager: Infrastructure Ontario

DB Team: Team (Kicking Horse Canyon Phase 4): Kicking Horse Canyon Constructors: Aecon Group Inc, Parsons, Emil Anderson Construction

Contractor: Emil Anderson Construction Inc. (Pritchard to Hoffman's Bluff)

Engineer: Wood (consulting)

Other Key Players: Golder (geotech., environmental services); Englobe (pavement engineering services, QA, QV); WSP (construction supervision services); McElhanney (design and planning services); Hanscomb (cost consultant); EY (mgmt. consultant)

Funding: P3

Substantial Completion: 2026

The Government of B.C. has embarked on a 10-year project to expand the Trans-Canada Highway (Highway 1) between the city of Kamloops and the Alberta border. Highway 1 includes 339 km under the jurisdiction of the B.C. Ministry of Transportation and Infrastructure, as well as 101 km under the jurisdiction of Parks Canada. There are seven sections of the work that are scheduled for completed over the next 3-5 years: Chase four-laning at a cost of $220M; Ford Road to Tappen Valley overhead, at a cost of $243 million; Salmon Arm west, at a cost of $155 million; Bruhn Bridge, at a cost of $224.5 million; Illecillewaet, at a cost of $85.2 million; Quartz Bridge and four-laning, at a cost of $123.7 million; and Kicking Horse Canyon Phase 4, at a cost of $601 million, to be completed in winter 2023-24. Since the launch of construction in early 2021, the major activity on the Kicking Horse Canyon Project consisted of clearing, excavating, drilling, piling and pier construction to establish the underpinnings of the many structures that will be used in straightening and widening the highway to a modern four-lane standard. By the end 2021, the first bridge girders will have been put in place, and there was significant progress on cuts and retaining walls.

43 Projet Hôpital Vaudreuil-Soulanges

$1.27 billion

NEW

Location: Vaudreuil-Dorion, Quebec

Owner: CISSS (Centre intégré de santé et des services sociaux) de la Montérégie-Ouest

Project/Construction Manager: Hydro-Québec Équipement

Contractor: HMI Construction Inc.

Engineer: Stantec; SNC-Lavalin; CIMA+

Other Key Players: GHD (geotechnical and material testing); Englobe (quality assurance inspection services)

Legal: Borden Ladner Gervais

Funding: Public

Substantial Completion: 2026

In 2022, the CISSS de la Montérégie-Ouest, in partnership with the Société québécoise des infrastructures and the Ministère de la Santé et des Services sociaux, will break ground on the future Hôpital de Vaudreuil-Soulanges. This ambitious infrastructure project will provide the region with a 404-bed hospital, featuring an 11-room operating block and a 41-stretcher emergency department—the second biggest in the Montérégie region. Estimated at $1.7 billion, this project will position the Hôpital de Vaudreuil-Soulanges as a leading-edge facility and a model for the next generation of Québec hospitals. The hospital will be equipped with state-of-the-art technologies and innovations aimed at optimizing the experience for both patients and staff. It will also be built according to environmental and sustainable development best practices. The Hôpital de Vaudreuil-Soulanges is scheduled to open in 2026, prior to which the CISSS de la Montérégie-Ouest estimates that more than 3,200 people (staff, managers, and doctors) will need to be hired.

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44 Renovations to Beauharnois Generating Station

$1.6 billion

2021 Rank: 40

Location: Beauharnois, Quebec

Owner: Hydro-Québec

Project/Construction Manager: Hydro-Québec Équipement

Contractor: HMI Construction Inc.

Engineer: Stantec; SNC-Lavalin; CIMA+

Other Key Players: GHD (geotechnical and material testing); Englobe (quality assurance inspection services)

Supplier: GHD (geotechnical and material testing); Englobe (quality assurance inspection services); Voith Hydro

Legal: Borden Ladner Gervais

Funding: Public

Substantial Completion: 2022

Since 1994, this hydroelectric station has been undergoing gradual renovations and replacement of its generation units. The plant was powered by the Beauharnois Canal, which had been newly dredged and expanded to one kilometre in width for that purpose. At the time of its construction, it was considered to be the largest hydroelectric station in Canada. Today, at 1,900 MW, it is still one of the largest run-of-river plants in the world. The current project also includes restoration of the station's historic art deco architecture, which led it to be designated as a National Historic Site. Renovations continue, and work is expected to be completed in 2022, with the last of six generating units undergoing performance optimization.

45 Macdonald Block Reconstruction Project

$1.536 billion

2021 Rank: 41

Location: Toronto, Ontario

Owner: Ontario Ministry of Government and Consumer Services

Project Manager: Infrastructure Ontario

DBFM Team:
Fengate PCL Progress Partners (FP3)
- Developers: Fengate Asset Management and PCL Investments Canada Inc.
- Design-Builder: PCL Constructors Canada Inc.
- Design Architect: WZMH Architects
- Facilities Management: Johnson Controls Canada
- Financial Advisor: National Bank Financial.

Engineer: TMP (mechanical)

Other Key Players: Aon (risk advisor); Hanscomb; Morrison Hershfield; Entuitive; EY (mgmt. consultant); Comtech (project mgmt. consultant); WSP (independent certifier)

Funding: P3

Substantial Completion: 2024

The Macdonald Block Complex is the hub for administrative services for the Government of Ontario. The complex consists of five buildings, including four office towers, with a total of approximately 1.7 million square feet. From Infrastructure Ontario: "Each building in the complex will be taken back to its original building core, remediated and rebuilt using modern technologies, systems and materials while preserving the integrity of its many heritage features. The newly reconstructed complex will meet current building, health, safety, and accessibility standards and will accommodate significantly more employees through more efficient use of this government-owned office space." A significant milestone to occur in 2021 was the first of many concrete pours within the complex's underground parking area. Infrastructure Ontario noted the importance of this milestone in their March report, stating that it marks an official "transition from demolition to reconstruction."

46 Bloor-Yonge Station Capacity Improvements

$1.514 billion

2021 Rank: 42

Location: Toronto, Ontario

Owner: Toronto Transit Commission

Other Key Players: AECOM (preliminary design and early works); Golder (geotechnical studies)

Funding: Public

Substantial Completion: 2029

Bloor-Yonge station is at the heart of the Toronto transit network, and represents one of the busiest stations in the entire system. It is one of three stations where Line 1 and Line 2 of the Toronto transit system intersect. The Toronto Transit Commission (TTC) has identified that, without significant work to improve station capacity, severe overcrowding and bottlenecks will occur, even more so once work is completed on the Yonge North Subway Extension over the next decade. In February 2020, Toronto City Council approved the TTC's 2020-2029 Capital Budget, which includes $1.514 billion for this project. The project is still in the preliminary design phase, with completion targeted for Q4 2029.

47 Cascade Power Project

$1.5 billion

2021 Rank: 43

Location: Yellowhead County, Alberta

Owner: Kineticor Resource Corp.

Construction Manager: PCL

Contractor: Graham (Phase 1)

Engineer: PCL/ Black & Veatch JV (engineering design); McElhanney (consulting)

Supplier: Siemens (2x SCC6-8000H Power Trains)

Financier: Macquerie Capital, OPTrust (joint development sponsors); OPTrust, Axium Infrastructure, DIF Capital Partners (project sponsors)

Legal: Osler (advisor for Kineticor)

Funding: Private

Substantial Completion: 2023

The Cascade Power Project is a 900 Megawatt (MW) combined cycle natural gas-fired generating facility, being constructed approximately 12 kilometres southwest of Edson in Alberta's Yellowhead County. Upon completion, the new plant will have the capacity to supply up to eight per cent of the province's overall current energy needs. Financial close on the project was reached in August 2020. Construction is underway, and is scheduled for completion sometime in 2023. In 2021, the Alberta Indigenous Opportunities Corporation (AIOC) is announced that as its first commitment it has provided a loan guarantee to a consortium of six Alberta First Nations to enable their participation in the project.


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48 Royal Columbian Hospital Redevelopment Project

$1.49 billion

NEW

Location: New Westminster, British Columbia
Owner: Fraser Health Authority
Design-Build Team: EllisDon Design Build Inc.
Architects: Parkin Architects Ltd.; HDR Architecture Associates, Inc.
Funding: Public
Substantial Completion: 2026

The Royal Columbian Hospital redevelopment is a three-phase, multi-year project that will increase the hospital's capacity by approximately 50%, help ease congestion, introduce advanced medical technologies and improve the health care environment for staff and patients. Phase 1's new Mental Health and Substance Use Wellness Centre opened in August 2020. Phase 2 of the project is now under construction. In 2021, we began excavation, demolished some older buildings and opened an interim support building to house support services during construction of the new Acute Care Tower. Milestones in 2022 will focus on Phase 2 and will include completion of: Phase 2 design; demolition; Campus Communications Hub preliminary works; Energy Centre preliminary works; substructure concrete; level 0 floor slab; and steel superstructure. Also in 2022, we expect to complete the schematic design for Phase 3.

49 SmartTrack Stations Program

$1.463 billion

NEW

Location: Toronto, Ontario
Owner: City of Toronto/ Province of Ontario
Project Manager: Metrolinx
Funding: Public
Substantial Completion: 2026

The SmartTrack Stations Program will improve transportation choices within Toronto by leveraging existing transit infrastructure to serve more people. Combined with Metrolinx's GO Expansion Program, SmartTrack will transform heavy rail infrastructure in Toronto from a regional commuter service into an urban rapid transit network. SmartTrack, as originally defined, included six new stations along the Kitchener and Stouffville/Lakeshore East corridors. The province's New Subway Transit Plan for the GTA will be adding stations near Gerrard-Carlaw and Lawrence-Kennedy, making those two originally-planned SmartTrack stations redundant. The Province and City have since agreed to remove the Gerrard-Carlaw and Lawrence-Kennedy locations and add Bloor-Landsdowne. The five SmartTrack Stations include: Finch-Kennedy, East Harbour, King-Liberty, Bloor-Landsdowne, and St. Clair-Old Weston. The cost includes both $1.195 billion for Base Station Infrastructure and $268 million for City-Initiated station requirements, which consists of all station-related capital costs including without limitation the costs for planning, design, capital financing, risk, contingency, escalation, project management and property acquisition. Request for Proposals (RFPs) are expected to go out for the following SmartTrack stations in early 2022: St. Clair-Old Weston; Finch-Kennedy; and King-Liberty; Bloor-Landsdowne.

50 Louis-Hippolyte-Lafontaine Tunnel Project

$1.426 billion

2021 Rank: 50
Location: Montréal, Quebec
Owner: Ministère des Transports du Québec (MTQ)
P3/Project Team: Vinci (subsidiaries Eurovia and Dodin Campenon Bernard); Pomerleau (50-50 JV)
Engineer: Parsons, Tetra Tech (owner's engineer); WSP; Hatch (lead); Lombardi (tunnel safety); EXP (design, consulting)
Other Key Players: Aon (risk advisor); CIMA+, Egis (independent certifier); Jacobs (mgmt. consultant); Deloitte (mgmt. consultant); Englobe
Financier: Desjardins Capital Markets
Legal: Borden Ladner Gervais
Funding: P3
- **Federal:** $427.7 million
- **Provincial:** $994 million
- **Municipal:** $4.1 million

Substantial Completion: 2024

The original Louis-Hippolyte Lafontasine Tunnel was constructed in 1967, and was in need of significant rehabilitation or replacement in order to make it viable for residents in Montreal. In August 2020, the contract was awarded for the rehabilitation project. Construction work began in 2021 and included: Installation of lane diversions on autoroute 25 for the reconstruction of concrete slabs; Development of preferential measures for public transit, including a westbound widening to add a third lane; Development of three incentive parking lots on the South Shore; Repair of the tunnel service corridor walls; and Work related to preparatory work, such as the installation of louver beams or the construction of a temporary exit that will enter service later as part of the reconstruction of the autoroute 25 roadway.

A Decade of Top100

The total value of the Top100 projects list has grown over the years (in billions of dollars)

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
114.2	140.7	157.9	161.3	187.5	199.0	212.6	240.8	253.8	273.0

51 Calgary Cancer Centre

$1.4 billion

2021 Rank: 44

Location: Calgary, Alberta

Owner: Alberta Health Services

Design-Build Team: PCL; Stantec; DIALOG

Architect: HKS and Marshall Tittemore Architects (subconsultants); DIALOG; Stantec

Other Key Players: Arup (technical advisor and prime consultant); EY (advising gov't.); KPMG (commercial advisor); Morrison Hershfield (commissioning study); Colliers Project Leaders; Aon (risk advisor)

Supplier: Canam Group

Legal: Norton Rose Fulbright (for the authority)

Funding: Public

Substantial Completion: 2023

This new comprehensive cancer centre is currently under construction at the Foothills Medical Centre site in Calgary. The 95,000-plus-square-metre complex will include 160 inpatient beds, outpatient facilities with over 100 exam rooms, systemic treatment and radiation treatment technologies, clinical trial units and research laboratories, a knowledge exchange centre and 1650 stalls of underground parking. The centre will provide much-needed access to cutting-edge treatment and care for residents of Calgary and southern Alberta. Despite the impacts of the COVID-19 pandemic, the project reached its topping off point in late April 2020 and remains on schedule for completion in 2023. The project is expected to achieve Substantial Completion end of fall 2022, followed by a two-year warranty period. Commissioning process has begun and user training will begin in early 2022 in preparation for turn-over of the facility to Alberta Health Services. Final submission for LEED accreditation is expected to be submitted to the Canadian Green Building Council by the end of 2022 and for accreditation the following year.

52 Burnaby Hospital Redevelopment

$1.4 billion

2021 Rank: 46

Location: Burnaby, British Columbia

Owner: Fraser Health Authority

Project Manager: Partnerships BC

DBF Team: EllisDon Infrastructure (Phase 1)

Funding: Public

Substantial Completion: 2028

The new Toronto Courthouse will amalgamate several Toronto courts located throughout the city. Phase one of the redevelopment will see the construction of a six-storey, 83-bed pavilion with underground parking. All patient rooms, except for one, will be single-patient for privacy. The pavilion will include a maternity and labour unit, a neonatal intensive care unit and a medical inpatient unit with negative pressure rooms and outbreak zones to isolate infectious diseases. The pavilion will also include a new inpatient mental health and substance use unit with a secured outdoor patio. Within this unit is a five-bed crisis stabilization unit that will provide short-term inpatient care, assessment and treatment for patients in crisis, at risk or in severe distress. EllisDon was announced as the preferred proponent to build phase one. Foundation, phase one will cost approximately $612 million. Construction on phase two, which includes building the second patient-care tower with 160 beds and a new cancer treatment centre, is expected to begin in 2025, once the business plan is approved. The last major upgrade to the Burnaby Hospital was more than 40 years ago.

53 Pattullo Bridge Replacement Project

$1.377 billion

2021 Rank: 45

Location: New Westminster, British Columbia

Owner: Province of British Columbia (The Transportation Investment Corporation is leading the delivery of the project on behalf of the Ministry of Transportation and Infrastructure)

Joint Venture Design Team: Leonhardt, Andrä and Partner (LAP), EXP, Thurber Engineering, GNEC, VIA Architecture, Hatch

Owner's Team: Charter PDI, WSP, R.F. Binnie, Northwest Hydraulic Consultants, Tetra Tech, TYLin, Archer CRM

DBF Team: Fraser Crossing Partners

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

Engineer: Parsons (Owner's Engineer); Hatch; Wood (consulting); Tetra Tech (environmental)

Other Key Players: Golder; Morrison Hershfield (engineering services); Deloitte (commercial advisor); Hemmera; Hanscomb (cost consultant); McElhanney, G. Ho Engineering Consultants (road safety audits); WSP (independent certifier)

Legal: Borden Ladner Gervais; McMillan LLP (for the lender)

Funding: Public

Substantial Completion: 2024

In February of 2018, the Government of British Columbia announced its plans to replace the Pattullo Bridge. Built in 1937, the bridge is one of the oldest in the Metro Vancouver area, and was built for a 50-year lifespan. In May 2019, the project was granted an environmental assessment certificate. The Acciona/Aecon joint venture team was selected as the preferred proponent in December 2019, with the contract awarded in February 2020. Major construction is underway in river and on land. The new bridge will be four lanes that will be built to modern safety standards, featuring a centre safety median barrier and wider lanes to accommodate both passenger and commercial vehicles. The new bridge will also have dedicated walking and cycling lanes separated from traffic on both sides of the bridge and is designed to accommodate potential future expansion to six lanes. The new bridge will be located just upstream and northeast of the existing bridge and will optimize the use of the existing road network and travel patterns. The existing bridge will remain in use until the new bridge is open to traffic. Once the new bridge is open, the existing bridge will be demolished.

54 Port Hope Area Initiative

$1.28 billion

2021 Rank: 47

Location: Port Hope and Clarington, Ontario

Owner: Atomic Energy Canada Ltd., Natural Resources Canada

Project/Construction Manager: Canadian Nuclear Laboratories

Contractor: Wood-CB&I Joint Venture; ECC/Quantum Murray Limited Partnership; Wood; Maple Reinders; Kenaidan Contracting Ltd.; Northwind Portage; Milestone Environmental; WSP; Graham

Engineer: GHD/MMM Joint Venture; AECOM; Wood (consulting)

Environmental Services: Golder (contamination investigation/remediation; Phase I ESA; geotechnical); Arcadis Canada; Dillon Consulting

Other Key Players: Hanscomb (owner's preliminary design stage cost consultant and special advisor); Arcadis (excavation and waste removal); Tetra Tech; SNC-Lavalin; Colliers Project Leaders; CIMA+; Aon (risk advisor)

Financiers/Banks: Natural Resources Canada

Legal: Osler; Torys (acted for the lender)

Funding: Public

- **Federal:** Atomic Energy of Canada Ltd.: $1.28 billion

Substantial Completion: Port Granby Project—2022; Port Hope Project—2025

The Port Hope Area Initiative (PHAI) is a federal environmental clean-up program. Its mandate is the remediation and local, long-term, safe management of approximately 1.7 million cubic metres of historic low-level radioactive waste in the municipalities of Port Hope and Clarington in southern Ontario, Canada. The historic waste resulted from the radium and uranium refining operations of the former Crown corporation, Eldorado Nuclear Limited, and its private sector predecessors, which operated from the 1930s to 1988.

The PHAI has two projects: the Port Hope Project and the Port Granby Project. The Historic Waste Programs Management Office, led by Canadian Nuclear Laboratories (CNL), is implementing these projects on behalf of Atomic Energy of Canada Limited, a federal Crown corporation.

The Port Hope Project involves the construction of an engineered aboveground mound and supporting infrastructure for the safe, long-term management of approximately 1.2 million cubic metres of historic low-level radioactive waste, cleanup of the waste from various major sites and small-scale sites in Port Hope and transportation of the waste to a new long-term waste management facility (LTWMF) currently under construction. After the facility is capped and closed, anticipated to be in 2025, ongoing maintenance and monitoring will continue for hundreds of years.

The Port Granby Project involves the relocation of approximately 450,000 cubic metres of historic low-level radioactive waste, removed from a former storage site on the shoreline of Lake Ontario in Southeast Clarington, to a new, engineered aboveground mound at a long-term waste management facility approximately 700 metres north of the lake.

In November 2020 CNL announced a significant milestone for the Port Granby Project. Following the removal of more than 1.3 million tonnes of contaminated soil and industrial garbage that had been located on the unstable shoreline site for almost a century, the historic low-level radioactive waste is now securely stored at the new long-term waste management facility.

In September 2021, CNL marked the completion of the capping and closing of the storage mound, representing the most significant project milestone to date, and moving the project to the final stage in addressing this long-standing environmental issue. Monitoring and maintenance will continue at the Port Granby LTWMF for centuries to come.

55 Annacis Island Wastewater Treatment Plant Expansion

$1.27 billion

2021 Rank: 81

Location: Delta, British Columbia

Owner: Metro Vancouver

Construction Manager: Hatch (outfall project); CDM Smith (Overall Construction Coordination)

Contractors: JJM Construction and Geopac Inc. (Phase 1 ground improvement and 12.5 kV power feed relocation); Graham/AECON Joint Venture (Phase 1 treatment plant process structures and equipment); North American Construction (blowers contract); Kenaidan Contracting (computer control system and laboratory building, cogeneration and backup power); Maple Reinders Inc (Phase 2 Gravity Thickeners and Aeration Tanks Retrofit); Bennett Mechanical Installations (Phase 2 Digester Heat Exchangers Upgrade); Pomerleau-Bessac General Partnership (outfall pipeline)

Engineers: Brown and Caldwell, Stantec, EIC Solutions, Klohn Crippen Berger (stage 5 expansion); CDM Smith, Golder, McMillen Jacobs (outfall); Wood/Black & Veatch (cogeneration backup power); EXP (geotechnical eng. & monitoring/instrumentation)

Other Key Players: AECOM (Stage 5 Phase 1 Design review); WSP (3rd Party materials engineering and testing); Hatch (tunnel design review and outfall construction management); Colliers Project Leaders; Jacobs; CDM Smith; Associated Engineering (project management and construction mgmt. staff augmentation); Envirowest (environmental)

Legal: Norton Rose Fulbright (for Metro Vancouver)

Funding: Public

Substantial Completion: 2027

The Annacis Island Wastewater Treatment Plant currently serves 1.25 million people in 14 Metro Vancouver municipalities, and once the Stage 5 project is complete, it will serve 1.5 million people. The previous expansion, Stage 4, was done in the late 1990s. The $184 million contract for the outfall pipeline was awarded in September 2019. The outfall pipe will be excavated using a tunnel boring machine. The Annacis Island facility currently treats wastewater using primary and secondary treatment technologies. An expanded facility will ensure that the plant can manage a higher volume of wastewater, continue to keep odour to a minimum and will continue to operate in the event of a major earthquake. There are over 20 projects planned as part of the on-site improvements of the Annacis Island Wastewater Treatment Plant. Improvement projects include: New trickling filters; Secondary clarifiers; and A co-generation facility to make better use of green energy captured on site.

56 Port Lands Flood Protection and Enabling Infrastructure

$1.25 billion

2021 Rank: 48

Location: Toronto, Ontario

Owner: City of Toronto

Project Manager: Waterfront Toronto; City of Toronto

Construction Manager: EllisDon

Contractor: Colliers Project Leaders; Arcadis; HDR; INTECH; Altus; Geosyntec; Stantec; Entuitive; Grimshaw; Dillon

Engineer: Wood (consulting); WSP; Cherubini Metal Works Ltd.; DTAH; Planmac; Jacobs

Architect: Michael Van Valkenburgh Associates Inc. (Port Lands Estuary Plan)

Environmental Services: Arcadis Canada; Interfluve ; GHD ; GFL ; Englobe ; Geo-Solutions

Other Key Players: SBP; Golder; A.W. Hooker Associates Ltd.; Hanscomb; HRI (heritage contractor); Earth Boring Co. Ltd.; Priestly Demolition Inc.

Supplier: DECAST

Funding: Public

- The federal, provincial, and municipal governments are each contributing an equal share of $416.6 million to this project.

Substantial Completion: 2024

The Port Lands Flood Protection and Enabling Infrastructure project is the redevelopment of one of the largest portions of under-developed land in a major urban core in North America. Located along the shore of Lake Ontario southeast of Toronto's downtown core, the project will include substantial soil remediation, a new month for the Don River, and critical infrastructure for flood resilience to unlock the 325-hectare site for residential and commercial development. In winter 2021, the third of four bridges arrived in Toronto from Halifax. These bridges will connect Toronto to Villiers Island once flood protection is complete. This year, planting is starting in the new river valley. For detailed updates, follow @TheRockRipper on Twitter.

57 West Park Healthcare Centre

$1.2 billion

2021 Rank: 49

Location: Toronto, Ontario

Owner: West Park Healthcare Centre

Project Manager: Infrastructure Ontario

DBFM Team: EllisDon Infrastructure Healthcare—CannonDesign, Montgomery Sisam Architects (design); EllisDon (constructor); EllisDon Facilities Services Inc. (facilities management provider); EllisDon Capital Inc. (financial advisor); Modern Niagara Toronto Inc., Ozz Electric (mechanical and electrical subcontractor)

Engineer: TMP (mechanical); Entuitive (structural)

Other Key Players: EXP (PDC services); HOK (PDC services); Deloitte; A.W. Hooker Associates Ltd. (independent certifier); EY (financial advisor); Aon (risk advisor); Hanscomb (cost consultant)

Funding: P3

Substantial Completion: 2023

The West Park Healthcare Centre is a new 730,000-sq.-ft hospital that will replace the existing facility. The new hospital will feature 314 beds, with 80 per cent of beds in single-patient rooms. In August 2021 the hospital hit a major milestone with the final beam signing and topping off taking place. As well, two of the three tower cranes on site were dismantled in the summer of 2021, with the final crane to be dismantled in November 2021. Since the start of construction, significant progress has been made on the West Park Healthcare Centre redevelopment project, with more major milestones to be reached in 2022. By early 2022 the facility will be completely enclosed and will have permanent power on, followed by the start of commissioning.

58 Yellowhead Trail Freeway Conversion Project

$1 billion

2021 Rank: 51

Location: Edmonton, Alberta

Owner: City of Edmonton

Contractor: Lafarge Canada Inc. (61 Street to North Sask. River)

Engineer: Parsons (owner's engineer); Wood (consulting); AECOM (owner's consultant); WSP (design)

Funding: Public

- **Federal:** $241.6 million
- **Provincial:** $241.6 million
- **Municipal:** $516.8 million

Substantial Completion: 2027

Credit: City of Edmonton

The Yellowhead Trail Freeway Conversion Project will transition 15 kilometres of the current west-east roadway in Edmonton's north end to a free-flowing six-lane freeway, with a targeted speed of 80 km/h. The upgrade will eliminate eight intersections, build two new interchanges, modify three existing intersections, and build new collector roads. Construction on some of the connecting roadways began in 2019, while larger segments of the project started in 2020. The entire project is projected to be completed by the end of 2027. In 2021, the City of Edmonton completed the concept plan for the largest and most technically complex project of the Yellowhead Trail Freeway Conversion Program. The St. Albert Trail to 97 Street portion is expected to require approximately half of the freeway conversion's $1 billion budget. A key feature of the plan includes new interchanges at 127 Street and 115 Street, which Yellowhead Trail will pass under, with the north and south roads being built at their existing elevations. The $36.3 million Yellowhead Trail East Widening project was substantially completed in 2021 as scheduled, a key milestone in the overall completion of the freeway conversion.

59 Micoua-Saguenay Transmission Project

$1 billion

2021 Rank: 68

Location: Côte-Nord to Saguenay–Lac-Saint-Jean, Québec

Owner: Hydro-Québec

Contractor: Groupe Conseil Nutshimit Nippour (Section 8 clearing operations); Midifor Inc. (Section 9 and 10 clearing operations)

Other Key Players: Englobe

Supplier: Locweld (steel transmission towers)

Funding: Public

Substantial Completion: 2023

The new 735-kilovolt transmission line will connect Hydro-Québec's Micoua and Saguenay substations. The line will run roughly 262 kilometres through the Côte-Nord region (approx. 200 kilometres north of Quebec City) northwest through to the Saguenay–Lac-Saint-Jean region. The new line will help strengthen the reliability of the transmission system in the province. The project is scheduled for completion by the end of 2022. The last contracts were awarded in 2021, all the deforestation of the 262-kilometre line is scheduled to end in 2021.

60 GO Kitchener Expansion

$959 million

NEW

Location: Kitchener-Waterloo, Guelph, Halton Hills, Brampton, Mississauga, and Toronto, Ontario

Owner: Metrolinx

Engineer: Gannett Fleming, Aecom

Other Key Players: Canadian National Railway Company

Funding: Public

Substantial Completion: TBD

The Kitchener GO expansion will enhance train service over its outermost segment to offer a versatile regional travel option that runs outside rush hour. There will be more trips at every point along the line—from Kitchener-Waterloo, Guelph, Halton Hills, Brampton, Mississauga, and Toronto, including new stations along the way. The planned work and projected service levels on the Kitchener GO corridor can be divided into three geographic parts.

Part One: Union Station to Bramalea
- Fourth Track Installation
- Weston Station Improvements
- Highway 401 and 409 Rail Tunnel
- Bramalea GO Station
- Brampton GO Station Improvements:
- GO Expansion/Electrification

Part Two: Bramalea to Georgetown
- Heritage Road Layover

Part Three: Georgetown to Kitchener
- Track Work
- Speed River Bridge Improvements (Guelph)
- Guelph Locomotive Relocation
- King Victoria Transit Hub (Kitchener)

61 Toronto Courthouse Project

$956.4 million

2021 Rank: 52

Location: Toronto, Ontario

Owner: Ministry of the Attorney General

Project Manager: Infrastructure Ontario

DBFM Team: EllisDon Infrastructure—EllisDon Capital Inc. (developer); EllisDon Design Build Inc. (constructor); Renzo Piano Building Workshop, NORR Architects & Engineers Limited (design); EllisDon Facilities Services Inc. and SNC-Lavalin O&M (facilities mgmt.); EllisDon Capital Inc. (financial advisor)

Engineer: Wood (consulting); Jacobs (environmental); WSP (consulting)

Other Key Players: Morrison Hershfield (sustainability services for the lead contractor); A.W. Hooker Associates Ltd. (cost consultant); Engineering Harmonics; Aon (risk advisor); WT (independent certifier); Hanscomb (cost consultant)

Legal: Blake, Cassels & Graydon (advisor to the proponent); McCarthy Tétrault (advisor for MAG, IO); Norton Rose Fulbright (advisor for SNC-Lavalin), Farris, Vaughan, Willis & Murphy (advisor for the lenders and hedge providers)

Funding: P3

Substantial Completion: 2022

Credit: Infrastructure Ontario

The new Toronto Courthouse will amalgamate several Toronto courts located throughout the city. The building structure is complete, including 16 levels of cast-in place concrete and 2 levels of structural steel with metal deck. The building envelope is also nearing completion and will be air and watertight by the end of the summer. The curtainwall is complete on the East, South and West facade's, including the cable-wall system at this atrium level, with architectural precast panels on the North facade and elevator core. Finishes are ongoing in the atrium, including the finishing of the concrete columns which are over 20 meters tall, ceiling installation, and the installation of quartz paneling at the feature stair area. This area will also host a historic montage wall, featuring homages to the previous communities and buildings of this neighbourhood. Interior work is progressing on all levels, including 12 levels with courtrooms.

62 Port of Montreal Contrecoeur Terminal

$950 million

NEW

Location: Montreal, Quebec

Owner: Montreal Port Authority

Other Key Players: ARUP (preliminary engineering); Dentons (legal services); Samson (fairness monitoring support); PwC (commercial support)

Funding: Private
- **Federal:** $300 million (loan from Canada Infrastructure Bank)
- **Provincial:** $55 million (subsidy)

Substantial Completion: 2025-2026

The Port of Montreal is experiencing a historic growth of container traffic for the past seven years. To accommodate additional container capacity, a dedicated container terminal will be built as an expansion to the existing Contrecoeur site, within the Montreal Metropolitan Area. The greenfield terminal will be fully connected to the regional transportation hub, including a Class 1 railroad and highway connections, offering an efficient and competitive connection to/from Quebec, Ontario and U.S. Midwest markets. By 2025, with the support of Canada Infrastructure Bank and private partners, the Port of Montreal intends to develop a new state-of-the-art container terminal to handle 1.15 million twenty-foot equivalent units (TEUs). After receiving a favourable decision statement to proceed with the project and launching, in Q4 2021, an RFQ (Request for Qualification), qualified bidders will be selected by the end of Q2 2022 as the Request for Proposal phase will then start.

63 Giant Mine Remediation Project

$934 million

2021 Rank: 55

Location: Yellowknife, Northwest Territories

Owner: The Government of Canada (led by Crown-Indigenous Relations and Northern Affairs Canada with support from Public Service and Procurement Canada) and the Government of the Northwest Territories (led by the Department of Environment and Natural Resources).

Construction Manager: Parsons

Engineer: AECOM (environmental services, preliminary and detail design); Golder; Wood (consulting)

Environmental Services: Dillon Consulting ; SLR ; Blumetric

Other Key Players: SRK Consulting; Golder (multi-disciplinary consulting services, general and civil design); Hatch (design); AECOM (environmental services, preliminary and detail design); KPMG (commercial advisor); SRK Consulting, Arcadis Canada Inc. (lead technical advisors); Colliers Project Leaders; McElhanney (surveying services); Englobe

Funding: Public
- **Federal:** $903.5 million

Substantial Completion: 2025-35

Credit: Government of Canada

Between 1948 and 2004, Giant Mine was a major economic driver for Yellowknife and the Northwest Territories. Mining operations at the site grew over the years to encompass roughly 900 hectares, including a number of ponds and small lakes. In 1999, the former operator entered receivership and the Government of Canada, and its co-proponent, the Government of Northwest Territories (GNWT) became responsible for the Giant Mine site. Mining operations continued until 2004. When Canada and the GNWT became responsible for the mine, several environmental and site remediation needs were identified, including 237,000 tonnes of arsenic trioxide dust left behind in underground chambers, approximately 16 million tonnes of tailings, open pits, debris, site infrastructure and more. Today, the project's goals are to: minimize public and worker health and safety risks; minimize the release of contaminants from the site to the surrounding environment; remediate the site in a manner that instills public confidence; and implement a remediation approach that is cost effective and robust over the long term. The City of Yellowknife and the GNWT will decide how to use the site after remediation. However, as part of planning the remediation, the Project engaged the public to see how they envision potential future uses of the site. The project applied for the permit and licence again in 2019, which were approved in 2020. Implementation works began in summer 2021. After meeting the requirements of, and receiving all necessary regulatory approvals, reclamation work on Giant Mine was able to begin in summer 2021. Work in 2021 included: beginning the construction of a landfill to hold non-hazardous waste; underground stabilization preparatory work; geotechnical drilling; ongoing operation and maintenance of the effluent treatment plant; dust control; waste management, including temporary hazardous waste storage; sewage and greywater management; beginning metal recycling; and beginning construction of the first of four freeze pads.

64 Route 185 Phase III

$942.9 million

2021 Rank: 53

Location: Saint-Atonin, Quebec to the New Brunswick border

Owner: Ministère des Transports (MTQ)

Other Key Players: WSP, Tetra Tech, AECOM (construction supervision); Englobe

Funding: Public
- **Federal:** $389.7 million
- **Provincial:** $553.2 million

Substantial Completion: 2025

This nearly 40-kilometre conversion to two-lane divided highway is the final step in the conversion of Route 185 to Autoroute 85, also known as Autoroute Claude-Béchard. The final portion runs from Saint-Antonin to Saint Louis-du-Ha!-Ha!, connecting Autoroute 20 at Notre-Dame-du-Portage to the New Brunswick border. Work got underway on four of seven sections of the project in August 2019. Sections will be completed starting in 2021. In 2021, work will continue or begin on six of the seven sections of the project, covering approximately 32 kilometres. A first section was completed by the end of 2021.

65 Cowichan Hospital Redevelopment

$887.4 million

NEW

Location: Municipality of North Cowichan, B.C

Owner: Island Health

Other Key Players: Entuitive, WSP

Funding: Public

Substantial Completion: 2026

The Project consists of a replacement community-level hospital, with capacity for 204 inpatient beds, built to modern clinical and technical standards on a greenfield site on Bell McKinnon Road, a few hundred metres from Herd Road in the Municipality of North Cowichan. The facility will provide patient care and programs to address future service needs for the region while including the following: total building area of approximately 46,000 square metres; capacity for core inpatient and ambulatory services, including a total of seven operating rooms, and additional procedure rooms and outpatient/ambulatory clinic capacity, expanded diagnostic imaging, and expanded emergency department capacity. Two qualified teams, Alliance Care Partners and EllisDon + Parkin, have been shortlisted to participate in the next stage of the competitive selection process to design and construct the hospital. An RFP has been issued to the shortlisted participants. This is Phase 1 of a two-phase RFP process, which is expected to culminate in a preferred proponent in early 2022.

66 Richmond Hospital Redevelopment

$861 million

NEW

Location: Richmond, B.C.

Owner: Vancouver Coastal Health

Funding: Public

Substantial Completion: 2031

The expansion and renovation of the hospital will be conducted over four phases between 2022 and 2031. It will add 113 new beds, increasing the hospital's in-patient capacity to a total of 353 beds. Demolition of the North Tower and power plant is expected to begin in 2028 and be complete in 2031. The business plan for the redevelopment of Richmond Hospital has received final approval from the provincial government, triggering the start of the project's first construction phase in 2022. Design activities have commenced for preliminary renovations of the Milan Ilich Pavilion. Construction on those reformations will begin next year to set up cancer care and other services. With the North Tower anticipated to start accepting patients in 2028, South Tower and further Milan Ilich Pavilion completion are set for 2029.

67 Canadian Forces Base Trenton Expansion

$860 million

2021 Rank: 57

Location: Trenton, Ontario

Owner: Department of National Defence

Contractor: Bird Construction; SNC-Lavalin; Bondfield Construction; Buddy Haegele Enterprises; Budget Environmental Disposal; Dufferin Construction; Graham (general contractor for maintenance hangar); Fitzgibbon Construction; Gordon Barr Limited; Jasper Construction Corporation; Kiley Paving; M.J. Dixon Construction; Miller Group; Mirtren Construction; Strong Brothers Heating & Air Conditioning; Varcon Construction

Engineer: Wood, SNC-Lavalin, Jain & Associates, J.L. Richards & Associates, Peak, Stantec (design)

Architect: Architecture 49; Colbourne & Kembel Architects Inc.; Jacobs Carter Burgess; Kasian Architecture Interior Design and Planning Ltd.; Robertson Martin Architects Inc.

Environmental Services: Englobe

Other Key Players: Engineering Harmonics (AV consultant); Hanscomb (owner and design architect/engineer's cost consultant); DECAST

Supplier: Allen Mechanical; Alliance Forming; Amstel Manufacturing; AZ3; Black & McDonald; Canam Group (steel joists); CBM; Coco Paving; Coreslab Structures; Cremers Brothers Electric; Deep Foundation Contractors; Diamond Electric Contractors; Domson Engineering & Inspection; Dufferin Concrete; Eastern Ontario Terazzo and Tile Co.; Flynn Canada; Gilbert Steel Ltd.; JVH Masonry; Lafarge; LRL Associates Engineers; Presland Iron & Steel; Quinte Mobile Concrete; Select Door 7 Frame; Tri-con Concrete Finishing; Unistrut Canada; Vipond Fire Protection

Funding: Public **Substantial Completion:** 2022

Established in 1929, CFB Trenton has traditionally been an air base, home to the 8 Wing unit, and it is one of Canada's primary launching sites for military missions abroad. The base is now undergoing a major expansion that will add the Land Advanced Warfare Centre (a multi-functional training and administrative campus), as well as new hangers and runways to accommodate additional aircraft, and a new fire hall. It will also see the relocation of the elite Joint Task Force 2 to the base, and the addition of a hazardous material transfer facility, among other construction and reconstruction components. Substantial upgrades to the natural gas service and an expansion of the electrical service are underway. The project involves acquiring an additional 401 hectares of land—a move that has been controversial as it involves expropriating neighbouring farms, some more than 200 years old. The 10-year expansion program has already begun construction, with several components already complete. In July 2021, a construction contract began, repaving of a 3-kilometre runway and taxiway. The main taxiway was closed and then upgraded to become a temporary runway in time for the active runway to close in mid-September. A thick layer of both 20-year-old asphalt surfaces was ground off to allow underlying cracks to be filled prior to new asphalt being laid. In addition, 1,000 small repairs were made to the 300-metre concrete turning area at the east end of the runway. Painted airfield markings were added in mid-November, before freeze-up. These repairs will extend the life of these essential airfield arteries until a complete rebuild is possible.

68 East-West Tie Transmission Project

$777.1 million

2021 Rank: 59

Location: Municipality of Shuniah, Ontario to Wawa, Ontario

Owner: NextBridge Infrastructure, a partnership with NextEra Energy Canada, Enbridge Inc., and Borealis Infrastructure

Construction Manager: Quanta Services Inc.

Contractor: Valard

Engineer: Burns & McDonnell

Environmental Services: Dillon Consulting (environmental assessment)

Other Key Players: Ontario Energy Board and the IESO; Golder (environmental and social impact assessment, environmental inspection services for geotech. drilling program); Hatch (constructability reviews and access planning); Englobe

Supplier: Canam Group

Credit: Valard

Legal: Gowling WLG (counsel to NextBridge); Osler; Torys (acting for the owner)

Funding: Public

Substantial Completion: 2022

The East-West Tie Transmission Project is planned to consist of a new, approximately 447-kilometre, double-circuit, 230-kV transmission line, primarily paralleling an existing transmission line corridor. The new East-West Tie will which connects the Wawa Transformer Station to the Lakehead Transformer Station in the Municipality of Shuniah, near Thunder Bay, with a connection approximately mid-way at the Marathon Transformer Station. The need for the project was established by the Independent Electricity System Operator to; (i) increase capacity to meet expected electricity demand growth in northwestern Ontario, (ii) provide two-way power flow across the tie, allowing more efficient use of generation resources, and (iii) create improved electricity system reliability, flexibility and operation. Additionally, in March 2016, Ontario declared that the construction of the East-West Tie Transmission line is needed as a priority project. Construction on the project began in October 2019. it is scheduled for completion by the end of the first quarter of 2022. As of August 18, 2021, the Ministry of Natural Resources and Forestry revoked the Implantation Order, affecting construction activities and construction work resume across all work fronts. On July 21, 2021, due to extreme fire hazard and forest fires in the area, the Ministry issued Implementation Orders prohibiting construction activities associated with the project and NextBridge temporarily suspended construction from Thunder Bay to Pic Mobert First Nation. The Order was partially revoked on August 10 and fully revoked on August 18.

69 Ontario Public Safety Radio Network

$765 million

2021 Rank: 60

Location: Province of Ontario

Owner: Government of Ontario

Project/Construction Manager: Bell Mobility

Other Key Players: CIMA+; Entuitive

Funding: Public

Substantial Completion: 2023

In October, the Government of Ontario announced that it had awarded a contract to Bell Mobility to replace the province's aging Public Safety Radio Network. Under this project, Bell Mobility will: Build the Land Mobile Radio Network—the network's core infrastructure—as well as support antennas, servers and data centre equipment, which together will provide essential public safety radio coverage across the province; Provide first responders, as well as their dispatchers, with state-of-the-art radio equipment and consoles that enable quick and effective responses in emergency situations; and Provide network and radio equipment maintenance services for a period of 15 years.

70 Great Plains Power Station

$760 million

2021 Rank: 67

Location: Moose Jaw, Saskatchewan

Owner: SaskPower

EPC Contractor: Burns & McDonnell

Contractor: KMS Construction Ltd. (road upgrades)

Funding: Public

Substantial Completion: 2024

The Great Plains Power Station is the latest natural gas power plant being constructed in Saskatchewan, following the successful completion of the Chinook Power Station in 2019. The Great Plains Power Station is being constructed as a 350-Megawatt combined cycle plant, very similar to specifications of the Chinook project. In 2022, construction of the pilings, foundations, and underground installations will be completed. Once this work is complete, the powerhouse will be erected in Fall 2022. The focus of 2021 has been site preparation, piles and foundations. 2022 will be an extremely busy one for the project with manpower expected to peak at over 500 people in 2022. The administration building, warehouses and powerhouse building will be erected. Delivery and the start of installation of the heat recovery steam generator, the combustion turbine and steam turbine will occur in 2022.

71 Corner Brook Acute Care Hospital

$750 million

2021 Rank: 61

Location: Corner Brook, Newfoundland and Labrador

Owner: Government of Newfoundland and Labrador (to be turned over upon completion to the Western Health Regional Health Authority)

Project/Construction Manager: Corner Brook Care Team—B+H Architects, Montgomery Sisam Architects, Marco Construction

DBFM Team: Corner Brook Health Partnership
- Developer and equity member: Plenary Group
- Equity member: PCL Investments Canada Inc.
- Design-builder: PCL Constructors Canada Inc., Marco
- Mechanical-electrical Contractor: Cahill Group, Plan Group
- Architect: B+H Architects, Parkin
- Facilities Management: Johnson Controls

Contractor: Marine Contractors of Pasadena (site excavation and grading); Brook Construction (underground concrete water reservoir)

Engineer: WSP (structural)

Other Key Players: WSP (heliport planning, sustainability consulting); Hanscomb (functional programmer's cost consultant); INTECH Risk Management; EY (financial advisor); AGAT Labs; Aon (risk advisor)

Legal: Torys (owner); Borden Ladner Gervais

Funding: P3

Substantial Completion: 2023

This new hospital will continue to offer the high level of services currently available at Western Memorial Regional Hospital including emergency care, obstetrics, palliative care, rehabilitation, inpatient mental health services and diagnostic services, in addition to new services such as radiation treatment and a dedicated space for a PET scanner. Since breaking ground, tremendous progress has been made on site and the building is taking shape above ground. Some recent accomplishments include: Structural steel has reached the peak elevation and is continuing westward; Concrete pours progressing on the steel deck; Perimeter walls for the cancer care treatment areas have begun; and Finalizing design including significant time input from healthcare providers and hospital staff.

72 Carillon Generating Station Refurbishment Project

$750 million

2021 Rank: 62

Location: Saint-André-d'Argenteuil, Québec

Owner: Hydro-Québec

Design: WSP

Supplier: Andritz (turbines)

Funding: Public

Substantial Completion: 2027

Hydro-Québec will invest $750 million to refurbish its Carillon generating station, mainly to replace six generating units. Carillon generating station is a run-of-river power plant consisting of 14 generating units with a total installed capacity of 753 MW. Built in the early 1960s, it is a key part of Hydro-Québec's hydroelectric generating fleet. The station is close to the greater Montréal area and feeds power into the grid during peak consumption periods. The investment also covers the cost of civil engineering work, including making adjustments to water passageways, upgrading electrical equipment and replacing the station roof. Work began in 2021 and will continue until 2027.

73 CFB Esquimalt A/B Jetty Recapitalization Project

$743 million

2021 Rank: 63

Location: Constance Cove, British Columbia

Owner: Department of National Defence

Construction Manager: WestPro (Pomerleau) (demolition of the existing B jetty)

Contractor: Scansa Construction (utility corridor)

Engineer: SNC-Lavalin

Other Key Players: Wood (design authority for A jetty); Stantec (design authority for B jetty); BTY Group (cost consultant); Hanscomb (design engineer's cost consultant for Jetty A); McElhanney (survey/geomatics services); Milestone Environmental; Golder; Aon (risk advisor); Hemmera

Credit: Stantec

Funding: Public **Substantial Completion:** 2024

The aim of the jetty project is to demolish the existing A and B jetties at CFB Esquimalt's The A/B Jetty project supports Canada's National Shipbuilding Procurement Strategy, which will deliver modern ships to the Royal Canadian Navy over the next 30 years. It will be home to several of the Canadian-built vessels, including the new Arctic/Offshore Patrol Ship and Joint Support Ship. This $743-million project to replace aging 70-year-old jetties consists of three contracts for the design, demolition and construction of the new jetty. Work includes extending the utility corridor, dredging the seabed, demolishing B Jetty, preparing the site and constructing the new B Jetty portion. The new A/B jetties will be constructed on pipe piles up to 100 metres long that will be anchored into underlying bedrock. A robust structural system will tie the piles together using heavy-duty reinforced concrete beams and decking, and both are designed to support all classes of present and proposed Canadian Navy vessels.

74 Rehabilitation of Robert-Bourassa Generating Units

$732 million

2021 Rank: 72

Location: Baie-James, Québec

Owner: Hydro-Québec

Contractor: GE; TRANSAR

Other Key Players: EXP (plans and specs for mechanical systems); McElhanney; Englobe

Funding: Public

Substantial Completion: 2022

Credit: Hydro-Québec

Robert-Bourassa generating station is one of the crown jewels in Hydro-Québec's generating fleet. With an installed capacity of 5,616 MW, it is the most powerful generating facility in Québec. Its longevity is essential to ensuring the long-term supply of reliable power in Québec. This project includes the rehabilitation of eight of the sixteen generating units of the Robert-Bourassa generating station, as well as the speed governors, static excitation systems and cooling systems in all sixteen units. The DEW generating units (made by Dominion Engineering Works) will be the ones rehabilitated, as they show the most signs of wear. This work will allow Hydro-Québec. to optimize its facilities and adequately secure Québec's energy future. Project completion is targeted for 2022, which will see such milestones as the final assembly of the seventh generating unit (out of a total of eight to be replaced).

75 Highway 104 Project

$718 million

2021 Rank: 64

Location: Sutherlands River to Antigonish, Nova Scotia

Owner: Nova Scotia Department of Transportation

DBFOM Team: Dexter Nova Alliance

- Contractors: Dexter Construction, Nova Construction
- Equity Partner: BBGI

Design: WSP, Harbourside Engineering

Other Key Players: EY; CBCL Limited; Aird & Berlis

Funding: P3

Substantial Completion: 2023

The Highway 104 project will see 38 kilometres between Sutherlands River, Pictou County, and Antigonish twinned as well as the construction of new interchanges and bridges. The project includes: approximately 10 km of new, four-lane divided highway; 28 km of twinning existing highway; two new interchanges; 24 new bridges; upgrading and repaving of the existing two-lane section to like-new condition; and environmental enhancements including wildlife corridors and fencing. The twinning project that will make Highway 104 safer for motorists and improve the efficiency of one of the province's most important transportation corridors is well underway. The construction is on schedule and will be completed by the end of 2023. The project has seen major progress on fish bearing culvert installation, earth moving, structures and paving. Traffic has now started to be diverted to new lanes to allow work on the opposite lanes.

76 Travers Solar Project

$700 million

2021 Rank: 87

Location: Vulcan County, Alberta

Owner: Travers 2 Solar LP

Project Team: Copenhagen Infrastructure Partners; Greengate Power

Engineer: Tetra Tech

Other Key Players: Forum Energy Partners, PCL

Funding: Private

Substantial Completion: 2022

The Travers Solar Project is the largest solar energy project in Canadian history. Located on approximately 3,300 acres of land eight kilometres southwest of the village of Lomond in Vulcan County, the project will include the installation of around 1.3 million solar photovoltaic modules and 153 inverter/transformer stations. At 465 MW, the project will generate enough power to supply more than 150,000 homes. Construction of the Travers Solar Project began in 2021 and the project continues to engage with landowners, the community, and regulators, and has initiated a $100,000 Community Fund.

77 Bowmanville Extension Project

$655 million

2021 Rank: 80

Location: Bowmanville, Ontario

Owner: Metrolinx

Other Key Players: Wood, Stantec (technical advisory services); Deloitte, Golder, AECOM

Funding: Public

Substantial Completion: 2024

Building on the recommendations of the Bowmanville Expansion Initial Business Case (IBC) approved at the February 2020 Metrolinx Board meeting, the Preliminary Design Business Case confirms the feasibility of the alignment identified in the IBC, while examining two different weekend service options. The alignment proposes one new track plus sidings and passing tracks where necessary through Oshawa GO station connecting to CP's GM spur line to cross Highway 401, making an eventual connection through CP's Belleville Subdivision to Bowmanville. When service opens in 2024, the line will provide four morning trips along the line to Union Station in downtown Toronto, and four afternoon trips making all station stops to the new Bowmanville station. In September 2021, geotechnical work began along the Canadian Pacific-owned part of the rail corridor that eventually will lead to an expanded GO Transit line all the way to Bowmanville.

78 Highway 401 Expansion Project

$649 million

2021 Rank: 70

Location: Milton to Mississauga, Ontario

Owner: Ontario Ministry of Transportation

Project Manager: Infrastructure Ontario

Construction Manager: WSP

DBF Team: West Corridor Contractors

- Developer: Aecon infrastructure Management Inc. (Aecon), Parsons, Amico Design Build Inc. (Amico)
- Constructors: Aecon, Amico, Parsons
- Designers: Parsons (Lead Designer), Hatch, EXP
- Financial: National Bank Financial

Engineer: Hatch; Parsons (consulting)

Other Key Players: Operis (financial services); Morrison Hershfield (structural design review); A.W. Hooker Associates Ltd. (independent certifier); AECOM; Aon (risk advisor); DECAST; EllisDon; Golder (geotechnical services); Comtech (project mgmt. consultant)

Funding: P3

Substantial Completion: 2022

Credit: Greengate Power

The Highway 401 expansion project consists of an approximately 18-kilometre long stretch within the western part of the Greater Toronto Area, from the Credit River in Mississauga to Regional Road 25 in Milton. This portion of highway feeds into the northwest corner of Toronto, passing by Pearson International Airport before stretching across the top of the city heading east. The expansion project will create: 12 lane core-collector system from the Credit River to Winston Churchill Boulevard; 10 lanes from Winston Churchill Boulevard to Highway 407 ETR/ Highway 401 interchange; 12 lane core-collector system from Highway 407 ETR/ Highway 401 interchange to east of the James Snow Parkway; 10 lanes from the James Snow Parkway to west of Regional Road 25; median HOV lanes; and support facilities and features—drainage, lighting, signage, ATMS, carpool lots etc. The winning bidder was selected on April 26, 2019 and construction began shortly thereafter

79 SRB PIE-IX BRT Integrated Project

$638.2 million

2021 Rank: 99

Location: Montreal, Quebec

Owner: Autorité régionale de transport métropolitain (ARTM) / Ministère des Transports (MTQ) / City of Montréal

Delegated Manager: Pomerleau

Contractor: Société de transport de Montréal (STM)

Engineer: SNC-Lavalin (consulting); CIMA+; EXP (consulting)

Other Key Players: WSP (pre-feasibility study)

Legal: Borden Ladner Gervais

Funding: Public

- **ARTM:** $472.5 million
- **City of Montreal:** $165.2 million

Substantial Completion: 2023

The SRB Pie-IX project consists in setting up permanent high-level dedicated lanes, allowing buses to run on Pie-IX Boulevard, between Saint-Martin Boulevard in Laval and Pie metro station-IX, in Montreal. The 11-kilometre route will have 17 stations, with two in Laval and 15 in Montreal, and a 750-spot parking space at Laval's terminal station. 2022 will see the delivery of most of the project—from Saint-Martin Boulevard in Laval to Pierre-De Coubertin Avenue in Montreal (except for the Jean-Talon section between Everett and Bélair). The delivery of the Jean-Talon section, including construction of a pedestrian tunnel between the Pie-IX BRT and the future Blue Line extension station, is planned for 2023. The construction is currently started in 2021 and will continue in 2022. Detailed engineering concerning a final 1.6-kilometre section from Pierre-De Coubertin Avenue to Notre-Dame Street East will be completed.

80 Bonnybrook Wastewater Treatment Plant D Expansion

$630 million

2021 Rank: 76

Location: Calgary, Alberta

Owner: City of Calgary

Project/Construction Manager: Graham

Project Team: Balzers Canada Inc. (Mechanical Contractor); The Vector Group (Electrical Contractor); InCom Electric Corp (Electrical Contractor); Standard General Inc. (Underground); Whissell Contracting Ltd. (Underground); KLS Earthworks & Environmental

Engineer: Stantec; Jacobs; AECOM; SNC-Lavalin (consulting); Wood

Other Key Players: Hanscomb (owner's design stage cost consultant); Aon (owner advisor and construction insurance broker); WPC Water Solutions; AGAT Labs

Legal: Blake, Cassels & Graydon (advisor for the City of Calgary)

Funding: Public

- **Municipal:** $600 million

Substantial Completion: 2026

Bonnybrook Wastewater Treatment Plant is the largest of three wastewater treatment plants serving Calgary and area. Originally built in the 1930's, Bonnybrook is undergoing its most substantial upgrade to date. With an investment of more than $1-billon dollars over the span of 10 years, it is expected that Bonnybrook will see its total treatment capacity increase to nearly 1.4 million citizens when completed in 2026. In 2021, the project made significant progress. At Plant D, the greatest number of projects were completed and commissioned including the installation of two new primary clarifiers and six additional secondary clarifiers. This project also entailed the construction of three secondary treatment bioreactors and retrofits and upgrades to existing solids handling digesters, and the UV disinfection facility. Lastly, as part of this Plant D upgrade, a new bio-gas handling storage facility was completed and commissioned. In Spring of 2021, a new outfall was commissioned and put into service. This new larger outfall was built 900 m further downstream to provide additional flood resiliency and an improved diffusion system to enhance environmental performance.

81 Mills Memorial Hospital Replacement Project

$623 million

2021 Rank: 93
Location: Terrace, British Columbia
Owner: Northern Health Authority
Design-Build: PCL Westcoast Constructors Inc.
Architect: HDR Architects (subcontracted by PCL)
Funding: Public
- **Province of B.C.:** $512.4 million
- **North West Regional Hospital District:** $110.1 million

Substantial Completion: 2026

Construction began on a new Mills Memorial Hospital in Terrace, BC, in June 2021, after Northern Health signed an agreement with PCL Constructors Westcoast Inc. (PCL) to design and build the project. The new, state-of-the-art facility is being designed to address the current and future needs of patients in Northwest BC. The acute care hospital and integrated services facility will be a centre for trauma services, orthopedic surgeries, pathology, radiology, clinical support and pharmacy services. The hospital will also be a training site for medical students in the Northern Medical Program. The new facility is being built on the north end of the same property as the current facility. The new hospital is expected to start operating in 2025, followed by the demolition of the existing facility, parking and landscaping. The Mills Memorial Hospital Replacement project also includes the construction of a new Seven Sisters Mental Health residential facility, which will have an increase of 20 to 25 beds. The new Seven Sisters facility will also be built on the same property, on the south end.

82 GO Expansion Project – Off Corridor

$619 million

2021 Rank: 71
Location: Greater Toronto-Hamilton Area, Ontario
Owner: Metrolinx
Project Manager: Infrastructure Ontario
Other Key Players: Parsons (systems work); Golder (geotechnical services); Deloitte, Comtech (project mgmt. services); AECOM; Wood; WSP (technical advisory services); Morrison Hershfield (engineer-design)
Funding: Public
Substantial Completion: 2025

The Off Corridor projects for the GO Expansion is the smallest of the three sections of the project. The work includes "[...] customer and safety-related improvements to existing stations and the introduction of new stations that are delivered in partnership with local municipalities and property developers." (*Metrolinx Business Case, Fall 2018*). DB and DBF procurement models will be used for the projects in the off-corridor portfolio.

83 Rapide-Blanc Generating Station Refurbishment Project

$613 million

2021 Rank: 74
Location: Rapide-Blanc, Québec
Owner: Hydro-Québec
Contractor: Voith (installation of new turbines, generators, and digital governors, as well as the refurbishment of embedded turbine components)
Engineer: WSP (design); EXP (design)
Other Key Players: Englobe; HKA
Funding: Public
Substantial Completion: 2026

The Rapide-Blanc generation station is located on the Saint-Maurice River, 66 km north of La Tuque, Québec. The station's initial construction began in 1930 and was completed in 1934. All of the six units will be replaced. Four of the existing turbines were installed in 1934, which means that by the time the project is complete those units will have been in service for 90 years. The contract for the new units calls for a complete replacement of removable turbine and generator parts, the refurbishment of all embedded components and installation of digitally controlled governor units. The new units will also be more efficient and allow production of approximately 10 per cent more energy with the same amount of water. The components will be designed to last at least 70 years. The site work and assembly will begin in 2021 and, after commissioning, the contract is expected to be completed by the end of 2025. In July, 2021, upstream of Rapide-Blanc generating station, cofferdams were installed in front of the intake gates of generating unit 6 to hold the water back upstream and serve to isolate and dry out the work area

84 Calgary Event Centre

$608.5 million

2021 Rank: 82
Location: Calgary, Alberta
Owner: City of Calgary
Event Centre Manager: Calgary Sports and Entertainment Corporation
Construction Manager: CANA Construction in association with Mortenson
Development Manager: CSE Development Management Corporation
Designer: DIALOG, HOK
Engineers: Structural: Entuitive; Electrictal: ME Engineers—DIALOG; Civil: Stantec
Funding: Public/Private
- **Municipal:** $277.5 million
- **Private:** $321 million (Calgary Sports and Entertainment Real Estate Ltd.)

Substantial Completion: 2024

In July 2019, the City of Calgary and Calgary Sports and Entertainment Corporation, agreed to fundamental terms and conditions for the development and construction of a new public sports and entertainment event centre. The new centre will be home to the city's NHL, NLL, and WHL sports teams, as well as serve as a venue to attract top-tier music concerts, family shows, televised Award shows and international sporting competitions. The project also includes outdoor plaza infrastructure enhancements along Stampede Trail. Construction is scheduled to get underway in 2022 and wrap up by the end of 2024.

85 Gordon M. Shrum Generating Station Refurbishment

$600 million

2021 Rank: 75
Location: Peace River, British Columbia
Owner: BC Hydro
Contractor: Peter Kiewit Infrastructure
Turbine Supplier: Voith Hydro
Supplier: Andritz Hydro (rotor poles), Siemens (replacement transformers); Voith Hydro (turbines); Englobe (turbine QA)
Funding: Public
Substantial Completion: 2023

The G.M. Shrum Generating Station, located at the W.A.C. Bennett Dam, provides about 24 per cent of BC Hydro's hydroelectric power. Currently, there are several capital projects underway at this generating station and dam to replace the station's 50-year-old equipment. The largest, in terms of budget, was the replacement of five turbines and this project was completed in fall 2015. In 2018, work began to install new exciter transformers on units one through five. The Generators 1-10 Control System Upgrade is well underway with all major contracts awarded and 9 of 10 units completed. Work will be completed on spillway upgrades by early fall 2021 and the spillway gate project by 2022. Also, near the spillway will be the replacement of the reservoir boom. The boom is in design. Fabrication and installation are planned for 2022. Stoplog replacement is at the design for fabrication stage and installation is anticipated in 2023. Finally, 4 out of 10 of the 500 kV disconnect switches have been replaced with a target for full project completion in summer 2022.

86 Library and Archives Canada Preservation Centre

$580 million

2021 Rank: 77
Location: Gatineau, Quebec
Owner: Government of Canada
DBFOM Team: Plenary Partners Gatineau — B+H Architects; Group (Canada) Ltd.; PCL Constructors Eastern Inc.; PCL Investments Inc.; ENGIE Services Inc.
Other Key Players: Morrison Hershfield (BE/CLS work); EY (P3 advisor); Deloitte (financial advisor); Aon (risk advisor); Hanscomb (cost consultant)
Funding: P3
Substantial Completion: 2022

Plenary Properties Gatineau (PPG) was chosen by the Government of Canada to design, build, finance, and maintain Library and Archives Canada's (LAC) new preservation facility to be constructed adjacent to its existing preservation centre. The new state-of-the-art preservation facility is a solution to LAC's ongoing and future needs for special purpose infrastructure that provides appropriate preservation and access space for its analogue archival holdings. The new preservation centre will be the first net-zero carbon facility dedicated to archival preservation in the Americas, and the first federal building constructed to the requirements of Canada's Greening Government Strategy. The building is being constructed across from the current facility, located in Gatineau, Quebec. The building, containing archival records, will include six vaults, each fitted with high-density shelving and an Automated Storage and Retrieval System (ASRS). Each vault will require specific temperature and humidity set points as well as security and fire prevention and suppression systems.

Photos: Alberta Transportation

87 West Calgary Ring Road

$552 million

2021 Rank: 79
Location: Calgary, Alberta
Owner: Alberta Transportation
Contractor: EllisDon (North Section); FlatIron/Aecon (Bow River Bridge Twinning); Calgary Safelink Partners—Carmacks Enterprises Ltd., Graham Infrastructure LP, VINCI Infrastructure Canada Ltd. (South Section)
Engineer: Hatch (lead); Wood (consulting); Tetra Tech (design); Parsons (consulting)
Other Key Players: Deloitte (financial advisor); Burns & McDonnell (electric utility relocations); Parsons; Englobe; Morrison Hershfield (quality control)
Funding: Public
Substantial Completion: 2024

The 11-kilometre project is divided into three segments: the south one that connects with the Southwest Calgary Ring Road, the north one that meets the Trans-Canada Highway, and a new bridge across the Bow River. The north segment, running between Old Banff Coach Road and the Trans-Canada Highway, will be constructed by EllisDon. The project was tendered at a cost of $463 million. The West Bow River Bridge twinning project will be built by Flatiron and Aecon and has been tendered at a cost of $89 million. The contract for the south portion of the road was awarded in June 2020. The West Calgary Ring Road will be open in 2024, one year following the expected completion of the Southwest Calgary Ring Road project. When complete, the entire Calgary Ring Road will provide travellers with 101 kilometres of free-flow travel.

88 Lake St. Martin and Lake Winnipeg Outlet Channel Project

$540 million

2021 Rank: 83

Location: Interlake, Manitoba

Owner: Government of Manitoba

Contractor: TBD

Engineer: Hatch; KGS Group; Tetra Tech

Environmental Services: Stantec; North/South Consultants Inc.; WSP Global Inc.; and Magellanicum Ecological Services

Funding: Public
- **Federal:** $247.5 million
- **Provincial:** $292.5 million

Substantial Completion: 2025

Credit: Province of Manitoba

The $540 million flood protection project consists of a 24.1 km long channel from Lake Manitoba and a 23.8 km long channel from Lake St. Martin. The Lake Manitoba outlet channel includes an inlet at Lake Manitoba and outlet at Lake St. Martin, a new water control structure with a bridge and three new bridge crossings over the outlet channel. The Lake St. Martin outlet channel includes an inlet at Lake St. Martin and outlet at Lake Winnipeg, a new water control structure with a bridge, as well as the necessary Manitoba Hydro infrastructure to power the control structure. Construction is expected to commence in early 2022. During 2021, Manitoba Infrastructure continued to advance the Outlet Channels Project through the provincial and federal environmental assessment processes. Meetings are ongoing with federal regulatory agencies, Indigenous groups and stakeholders such as the Rural Municipality of Grahamdale. As the Outlet Channels Project continues to move through the environmental and consultation processes, engineering design work is happening concurrently. Preliminary engineering design is complete for all channel components and detailed design work is well underway. Construction tender packages are under development but cannot be released until a provincial licence and federal environmental approvals are received.

89 Route 389 Improvement Program

$525 million

2021 Rank: 90

Location: Baie-Comeau, Quebec to the Newfoundland-Labrador border

Owner: Government of Quebec

Contractor: Dexter Quebec (projet C); Groupe Alfred Boivin (projet B)

Other Key Players: BPR/AXOR Experts-Conseils Consortium (planning and specifications north of Manic-5); Roche-TDA Consortium, in conjunction with Inspec-Sol (GHD) (environmental assessment); WSP (route design work)

Funding: Public
- **Federal:** $183 million
- **Provincial:** $342 million

Substantial Completion: 2026

This 570-kilometre highway joins the city of Baie-Comeau in Quebec with the Newfoundland-Labrador border. The improvement program is key in the development of Plan Nord, as it will improve access to lands north of the 49th parallel. The program is divided into five individual projects: Project A: from Fire Lake to Fermont; Project B: Baie-Comeau to Manic-2; Project C: winding sector north of Manic-Five; Project D: Manic-2 north of Manic-3; Project E: Manic-3 North to Manic-5. After the commencement of Project C in 2019, Project B got underway in May 2020. Project C carries a cost of $27 million, while Project B represents an. investment of $121.8 million. Work has taken place on sections of the road, including Project C (completed) and parts of Projects D and E. Project B has been under construction since 2020.

90 BMO Convention and Trade Centre Expansion Project

$500 million

2021 Rank: 85

Location: Calgary, Alberta

Owner: Calgary Stampede

Development Manager: Calgary Municipal Land Corporation

Construction Manager: PCL Construction

Engineer: Tetra Tech (design); Entuitive

Architect: Stantec, S2 Architecture; Populous (planning and design)

Other Key Players: M3 Development; Wood

Funding: Public
- **Federal:** $166.6 million
- **Provincial:** $166.6 million
- **Municipal:** $166.6 million

Substantial Completion: 2024

Credit: CMLC

The 285,000 square feet BMO Convention and Trade Centre is Calgary's largest convention centre. The expansion project will create a tier-1 venue, the second largest facility of its kind in Canada. The project will more than double the size of the BMO Centre to almost one million square feet, transforming it into Canada's second-largest facility, and create new spaces for conferences, meetings, exhibitions and consumer shows. In June 2020, Calgary Stampede and the Calgary Municipal Land Corporation unveiled the design for the new Centre. The project is scheduled for completion by June 2024

91 GO Bus Infrastructure

$500 million

2021 Rank: 69

Location: Greater Toronto-Hamilton Area, Ontario

Owner: Metrolinx

Engineer: Hatch

Other Key Players: Comtech (project mgmt. consultant); Wood

Funding: Public

Substantial Completion: 2025

Metrolinx continues to invest in GO Bus Infrastructure throughout its GTHA network, including significant upgrades to several of its stations. The upgrades are complimentary to the work being done to expand rail service throughout the same corridor. As of mid-2021, more than 80 per cent of the project budget had already been spent ($400 million).

92 Faro Mine Remediation Project

$500 million

2021 Rank: 86

Location: Faro, Yukon

Owner: Government of Canada

Other Key Players: Parsons (care & maintenance/ interim construction manager); SRK (remediation design); Golder IMG (geotechnical); Golder (environmental monitoring)

Funding: Public

Substantial Completion: 2039

Faro Mine is a former open-pit lead-zinc mine, one of the largest of its kind in the world at approximately 25 square kilometres. It is located in south-central Yukon on the traditional territory of the Kaska Nations, near the town of Faro. Abandoned in 1998, resource extraction led to 70 million tonnes of tailings and 320 million tonnes of waste rock. Care and maintenance work since then has helped to ensure water quality so that environmental standards are met. In 2020, the construction of the North Fork Rose Creek re-alignment and associated contact water collection system was completed. In 2021 additional urgent works to collect contact water and increase water treatment capacity have been completed. Active remediation is expected to begin in 2025 following the successful completion of the Yukon environmental and socio-economic assessment process, and receipt of a water licence from the Yukon Water Board. Remediation is expected to take about 15 years to complete, followed by ongoing operations and monitoring.

93 Michael Garron Hospital Project

$498.2 million

2021 Rank: 88

Location: Toronto, Ontario

Owner: Toronto East Health Network

Project Manager: Infrastructure Ontario

DBF Team: EllisDon Infrastructure Healthcare—EllisDon Design Build Inc. (design-builder); B+H Architects, Diamond Schmitt Architects (design); Mulvey & Banani International Inc., Crossey Engineering Ltd., Stephenson Engineering Ltd., WalterFedy (engineer); EllisDon Capital Inc. (financial advisor)

Engineer: Wood (consulting); WSP (consulting)

Other Key Players: EXP (planning design & compliance services); A.W. Hooker Associates Ltd. (prime cost consultant and independent certifier for IO); Aon (risk advisor); Hanscomb (cost consultant)

Legal: Blake, Cassels & Graydon (advisor to the proponent); Borden Ladner Gervais

Funding: P3

Substantial Completion: 2023

The Michael Garron Hospital - Phase 1 New Patient Care Tower Project involves the construction of a new patient care tower and three-story connection, as well as demolition of some existing space and renovations to the existing hospital. The project includes: The creation of an eight storey Ken and Marilyn Thomson Patient Care Centre and adjoining three-storey building at the corner of Coxwell and Sammon Avenues; Demolition of several outdated wings (A, B, C, E, F wings and D podium); Four storey underground parking lot; and Renovations to existing spaces.

94 Côte-Vertu Station Underground Garage

$492.3 million

2021 Rank: 94

Location: Montreal, Quebec

Owner: Société de transport de Montréal (STM)

Project/Construction Manager: Société de transport de Montréal (STM)

Design-Build: Pomerleau

Contractor: Cegerco

Design: Provencher Roy & Assoc.

Engineer Consortium: Hatch; SNC-Lavalin, Stantec

Other Key Players: Englobe (geotechnical and environmental field surveillance); Macogep

Legal: Borden Ladner Gervais

Funding: P3

- **Federal:** $87.6 million
- **Provincial** (MTQ): $304.7 million
- **Municipal** (STM): $100 million

Substantial Completion: 2022

The new Cote-Vertu underground garage will double the capacity of the train storage available at the end of the Orange Line in Montreal, enabling for 20 trains to be stored at the site. Commissioning on this future underground metro garage is scheduled to be completed on March 2022. Additionally, landscaping and exterior architectural work will also be finalized around this period. Once completed, the future garage will enable the STM to increase its operational efficiency while improving service on its busiest line (the Orange Line) and support the expected growth in ridership over the coming years notably to keep pace with the extension of the Blue Line.

95 Yukon Resource Gateway Project

$469 million

2021 Rank: 91

Location: Yukon Territory

Owner: Government of Yukon

Engineer: Wood (consulting); WSP (bridge design)

Other Key Players: Associated Engineering (preliminary design); Tetra Tech (water sampling and ARD/ML assessment)

Funding: Public/ Private

- **Federal:** $248 million
- **Territorial Government:** $112 million
- **Private:** $108 million (local industry)

Substantial Completion: 2031

The Yukon Resource Gateway Project will provide the bypass at Carmacks and approximately 650 kilometres of needed upgrades of existing road infrastructure in the Dawson and Nahanni ranges—two key areas of high mineral potential and active mining in Yukon. That includes replacing road surfaces, bridges, and culverts in the two regions. In March 2020, a third agreement was signed as part of the project's development, this time with the Ross River Dena Council. The Yukon government is working in collaboration with Yukon First Nations to seek input and finalize Project Agreements for components of the Yukon Resource Gateway Program within their Traditional Territories. Six Project Agreements have been signed for seven components with Yukon First Nations to date. The program will provide opportunities to Yukon First Nations through short and long-term employment options, training and benefits agreements. Construction will improve access to mineral rich areas of the Yukon and will provide long term national benefits in additional to local opportunities. Construction activities have begun on the Nahanni Range Road and Carmacks Bypass components. Future projects will follow as Project Agreements with Yukon First Nations are reached and implemented.

96 Centerm Expansion Project

$454 million

2021 Rank: 92

Location: Vancouver, British Columbia

Owner: Vancouver Fraser Port Authority

Engineer: AECOM (Owner); Hatch/Moffat and Nichols (Contractor)

Project/Construction Manager: Centennial Expansion Partners (CXP), a joint-venture between Dragados Canada, Jacob Brothers Construction, and Fraser River Pile & Dredge Inc.

Contractor: Hatch; Moffat and Nichol; EXP; Mott Electric; PNR; Clearview; Hemmera; VIA

Other Key Players: WSP; AECOM; HKA PBX Engineering; Klohn Crippen Berger; RAM Engineering; Guidewire, Allman Safety

Credit: Vancouver Fraser Port Authority

Funding: Public

- **Federal:** $28.5 million

Substantial Completion: 2023

The Vancouver Fraser Port Authority is leading the Centerm Expansion Project to help meet increasing demand for containers shipped through the Port of Vancouver. It will increase container handling ability at Centerm Terminal by two-thirds, from 900,000 20-foot equivalent unit containers (TEUs) to 1.5 million TEUs. By increasing the terminal footprint by only 15 per cent and rearranging the terminal operations, the terminal will be able to handle more than 60 per cent increase in containers. The port authority is also leading the South Shore Access Project, which will improve port road and rail infrastructure. The improvements to port roads include extending Waterfront Road to connect it to Centennial Road and building the Centennial Road overpass. The Centennial Road overpass, completed in July of 2021, is a 600-metre two-lane elevated viaduct structure that will enable vehicle traffic to pass over two existing railway crossings. The new overpass will improve public safety, ensure more reliable commutes and better emergency response, reduce congestion, reduce GHG emissions and create job opportunities.

97 Springbank Off-stream Reservoir

$432 million

2021 Rank: 95

Location: Calgary, Alberta

Owner: Government of Alberta

Engineer: Stantec; Golder (environmental); Wood (consulting)

Environmental Services: Stantec

Legal: McLennan Ross (Counsel for the Government of Alberta); Osler (advisor to the Government of Alberta)

Funding: Public

Substantial Completion: 2024

The Springbank Off-stream reservoir represents the Government of Alberta's solution to mitigate severe flooding along the Elbow River, similar to what took place in June of 2013. Current plans call for a dry reservoir with a capacity of 70.2 million cubic metres, with an outlet structure to safely release the water back to the river when safe to do so. The reservoir will be located approximately 15 kilometres west of the City of Calgary. In October 2021 voluntary agreements were reached with landowners to secure the 3,700 acres of land needed for the project. The tendering process for construction has begun, with tenders sent to pre-qualified bidders. Construction is slated to begin in early 2022. Alberta Environment and Parks will be responsible for the operation of the project once construction is complete.

98 Royal Inland Hospital Patient Care Tower

$417.2 million

2021 Rank: 96

Location: Kamloops, British Columbia

Owner: Interior Health

DB(F)M Team: EllisDon Infrastructure
- Respondent team lead: EllisDon Capital Inc.
- Equity providers: EllisDon Capital Inc.
- Design-Builder: EllisDon Infrastructure
- Architect: Parkin Architects Ltd./Kasian
- Architects Service Provider: EllisDon Facility Services Inc.

Engineer: Tetra Tech (design); Entuitive; WSP

Funding: Public/Private
- **Provincial:** $397.5 million (Inland Health, Thompson Regional Hospital District and Government of B.C.)
- **Private:** $20 million (Royal Inland Hospital Foundation)

Substantial Completion: 2022

The Royal Inland Hospital, located in Kamloops, B.C., is a 254-bed tertiary acute-care hospital. It is one of two Interior Health tertiary referral hospitals. The Patient Care Tower project will take place in two phases. Phase 1 will be the design and construction of the Patient Care Tower, which will feature single-patient rooms and will bring Royal Inland Hospital up to current standards of care, improving working conditions, as well as infection control and prevention measures. Phase 2 will include significant renovation and expansion to the emergency department, pediatrics, post-anaesthetic recovery, and the morgue. The project has reached the topping-off milestone, bringing the concrete phase to completion, as the tower reaches its full nine-storey height. With the structural steel phase underway, residents can look forward to the tower opening its doors to patients in the summer of 2022.

99 Champlain Bridge Deconstruction Project

$400 million

2021 Rank: 98

Location: Montreal, Quebec

Owner: Jacques Cartier and Champlain Bridges Incorporated (JCCBI)

Construction Manager: CCF (Consortium CIMA+, FNX Innov)

Contractor: Nouvel Horizon St-Laurent GP: Pomerleau, Delsan A.I.M. Environmental Services Inc.
- Engineer: American Bridge Company, SNC-Lavalin, T.Y.Lin International Group, Harbourside, ARUP
- Design: Universal Structures Inc.

Engineer: PTA – Parsons, TeraTech, Wood (owner's engineer); McElhanney (consulting)

Other Key Players: Aon (risk advisor); EY (mgmt. consultant)

Supplier: Canam Group

Funding: Public

Substantial Completion: 2024

Credit: JCCBI

The Champlain Bridge (also known as Pont Champlain) was a steel truss cantilever bridge with viaducts constructed of prestressed concrete beams. It crosses the Saint Lawrence River, connecting the Island of Montreal to its South Shore suburbs. Opened in 1962, the structure was degraded by de-icing salt. In 2015, construction began downstream on a replacement bridge designed to handle higher volumes of traffic. The replacement bridge opened on July 1, 2019, and the old Champlain Bridge was closed to traffic. The deconstruction project of the bridge will consist of three methods: the deconstruction of the shoreline sections will be carried out from jetties set up along the river using standard equipment (excavators and cranes); work from the river, which will be required for over 65 per cent of the project, will be done with a system of platforms attached to high-capacity lifting towers installed on a catamaran barge; and work on the steel structure over the Seaway will begin in the fall and winter of 2021-2022.

100 Gene Zwozdesky Centre at Norwood

$384 million

2021 Rank: 100

Location: Edmonton, Alberta

Owner: CapitalCare Norwood

Project Delivery Provider: Alberta Infrastructure

Construction Manager: Clark Builders

Design: DIALOG

Funding: Public

Substantial Completion: 2024

The Zwozdesky Centre Project involves a 40,000 square foot redevelopment of the current CapitalCare Norwood site in Edmonton. Construction of the new resident tower is anticipated to be complete in late 2022. The new tower will accommodate 234 continuing care and post-acute beds, new ambulatory clinics, and an expanded CHOICE program. Also in 2022, preliminary work is expected to begin on the renovation of the Angus McGugan Pavilion (AMP), an Emergency Medical Services garage, and demolition of the existing North Pavilion and CHOICE Day Centre buildings. Once the renovations are complete, the AMP will accommodate 116 hospice and complex continuing care beds.

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