Top100

Canada's Biggest Infrastructure Projects

ReNew CANADA
The Infrastructure Magazine

2019

top100projects.ca

No. 81, Stouffville Corridor GO Expansion, Page 66

Credit: EllisDon

BOLD IDEAS

HOCHTIEF PPP Solutions North America and its sister company **Clark Builders** are proud to be delivering the **Stanton Territorial Hospital Redevelopment** Project in Yellowknife, a new 27,000-m² state-of-the-art hospital. The new facility is being constructed adjacent to the current hospital without disrupting clinical services. Although the original indicative design proposed refurbishing and extending the existing building, HOCHTIEF, Clark Builders and their partners instead developed an alternate design to construct a new hospital and repurpose the old building for use by local businesses and agencies.

HOCHTIEF provides equity for the development, investment and long-term asset management of numerous public-private partnership projects. Founded in Yellowknife, Clark Builders provides general contracting, design-build and construction management services across Western and Northern Canada. Globally, HOCHTIEF and its affiliates have successfully delivered more than 55 P3s and are currently responsible for 22 social infrastructure and 11 transport infrastructure long-term concessions. **www.hochtief-pppsolutions.com | www.clarkbuilders.com**

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ReNew CANADA
The Infrastructure Magazine

Top100 Projects — 2019
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GENUINE CANADIAN MAGAZINE

Turning Over In Record Numbers

If you only read through the first 10 projects in this report, little will seem different. Only one project is gone, and the one that took its place, the Gordie Howe International Bridge, has been part of our report for years. But looking beyond the top 10 shows a different trend, one that indicates record turnover in megaproject development in Canada.

This year's report sees the inclusion of 23 new projects, a record number by our report standards. To put this in perspective, a typical year sees 12-15 projects leave the list based on completion.

So what's changed? For starters, there really were a large number of projects that saw substantial completion; 2018 was a banner year for getting things done. But we also removed a handful of projects that have clearly stalled, no longer meeting the "currently under development" requirement that is part of this annual exercise.

And despite a year of political upheaval in many parts of the country, be it at the municipal or provincial scale, new megaprojects are moving forward at a solid rate. This can still be said in the latter part of 2018 despite not having a clear picture of the infrastructure priorities of two of Canada's largest provinces thanks to new governments being installed.

We also considered a new number one for this year's report, as our research team attempted to come to terms with how best to represent the $13.5-billion GO Expansion (formerly RER) project in Ontario. At the end of the day, rather than have it trump the Bruce Power refurbishment project at the top, we chose to break it down in the nine budgeted areas, the same way the project is represented by Metrolinx's chief capital officer Peter Zuk, and add as appropriate to this year's report.

As is the case each year, we continue to refine the requirements for inclusion on our list. Projects must be currently under development; it must be a public sector project; it must have a defined scope of work and dollar value; and it must have funding committed past the initial design and environmental assessment phase. That last requirement is key, as projects have appeared in the past that were being studied and designed, but did not have funding to move forward. That doesn't make a project a reality, so it should not be included on our list.

We hope you enjoy the 2019 Top100 Projects report. As always, if you have any questions, comments, or information to add, we are always listening. Feel free to email me at **andrew@actualmedia.ca** at any time.

Andrew Macklin, Editor, ReNew Canada

To create your own report, visit **top100projects.ca** and sort by **project cost**, **key players**, **location**, **sector**, and more.

PROUD TO BE PART OF OUTSTANDING PROJECTS ACROSS CANADA

GRAHAM TOP 100 PROJECTS 2019

Annacis Island Wastewater Treatment Plant | Bonnybrook Wastewater Treatment Plant D Expansion | Canadian Forces Base Trenton Expansion Capital Region District Wastewater Treatment Plant | Crowchild Trail Project | Don River & Central Waterfront Wet Weather Flow Systems & Connected Projects | **Regina Bypass Project (pictured)** | Southwest Calgary Ring Road | Vancouver International Airport Upgrades

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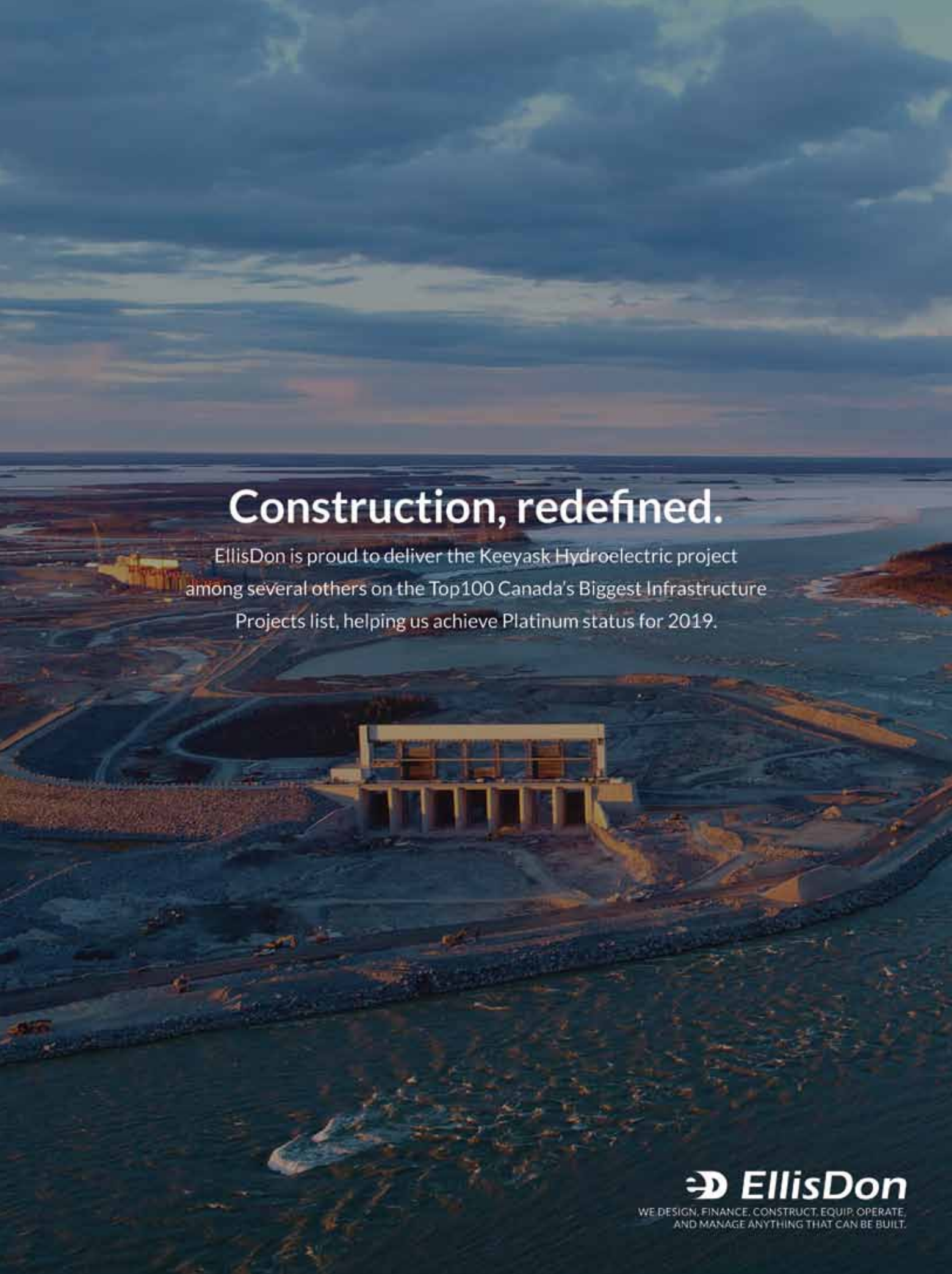
Top100 Project Index

By Rank, Project Title, and Page Reference

Buildings

Energy

Other


Construction, redefined.
EllisDon is proud to deliver the Keeyask Hydroelectric project among several others on the Top100 Canada's Biggest Infrastructure Projects list, helping us achieve Platinum status for 2019.
EllisDon
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Top100 Project Index (continued)

By Rank, Project Title, and Page Reference

Transit

rank project title page #

BRT

LRT

Rail

Subway

Transportation

rank project title page #

Airport

Bridge

Highway

Port

Figures

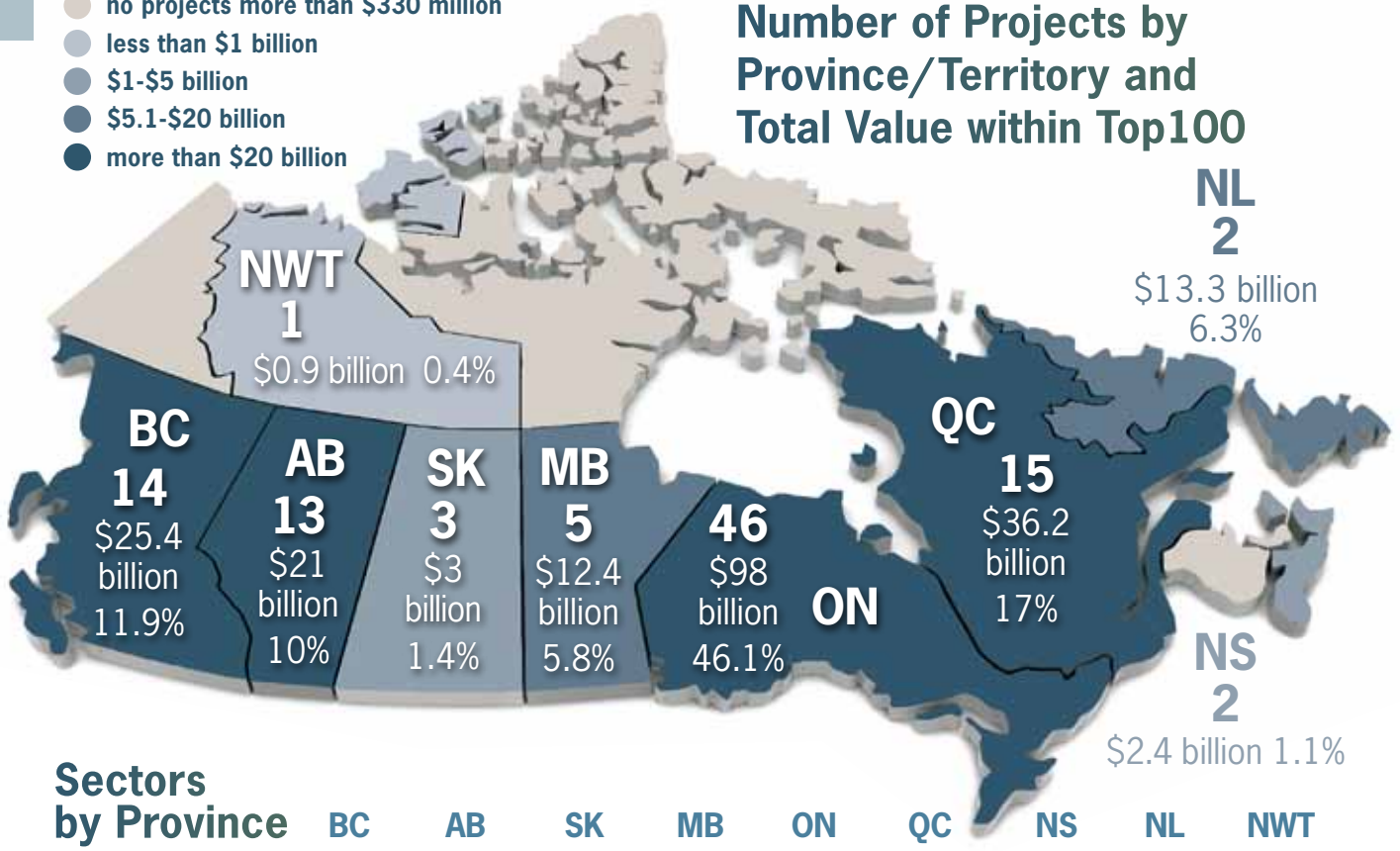
page #

Acronym Legend

AFP: Alternative financing and procurement
DBF: Design-build-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	NWT
Energy	2	1	1	1	5	4		1	
Buildings	2	4	1		10	4	1	1	
Transit	2	2		1	21	4			
Transportation	5	3	1	1	4	3	1		
Other	3	3		2	6				1

One cross-border project included on the list, which is ON/QC. Project valued halved for each province.

Projects by Sector

Energy

Hydroelectric	Transmission	Nuclear	Natural Gas	Wind
7	4	2	1	1

Transit

LRT	Rail	BRT	Subway
14	10	3	3

Buildings

Health Care	Public Spaces	Military	Education	Social Infrastructure
14	4	2	1	1

Transportation

Highway	Bridge	Port	Airport
12	3	2	1

Other

Water/Wastewater	Remediation	Carbon Capture	Waste Management
11	2	1	1

Excellence **in engineering**

Our clients and partners have come to rely on our innovative and results-driven approach in projects completed under traditional and alternative delivery models.

Regina Bypass, SK

Réseau express métropolitain, QC – Photo: CDPQ Infra

Beauharnois Generating Station, QC – Photo: Air Photo Max

We are proud to see our expertise recognized in 15 of the 2019 top 100 infrastructure projects:

- Eglinton Crosstown LRT
- Romaine Complex
- Réseau express métropolitain
- Gordie Howe International Bridge
- Green Line LRT
- New Champlain Bridge Corridor Project
- Turcot Interchange
- Quebec City University Hospital center - Laval University
- Regina Bypass Project
- Renovations to Beauharnois Generating Station
- Kitchener Corridor GO Expansion
- Barrie Corridor GO Expansion
- York VIVA Bus Rapid Transit (vivaNext)
- Port Hope Area Initiative
- Woodward Wastewater Treatment Plant

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Photos: Bruce Power

1 Bruce Power Nuclear Refurbishment

$13.0 billion

2018 Rank: 1

Location: Tiverton, Ontario

Owner: Bruce Powertop

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

Contractor: AECOM, Aecon, AREVA NP (Unit 6 steam generator replacement); Black & McDonald (Unit 6 mechanical and electrical projects)

Engineer: Hatch (preliminary/planning study)

Architect: Hatch (on MCS and decontamination building)

Reactor Components Supplier: Bombardier; Laker Energy Products

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

Other Key Players: WSP (drafting support); Golder

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)

Funding: Private

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 refurbishmment, and agrees to take full risk of cost overruns on refurbishments of the six nuclear units.

In April, Bruce Power announced the awarding of over $914 million worth of manufacturing contracts, which will provide necessary components for the refurbishment when it gets underway in 2020.

Energy Development in Canada

Total investment in Energy: **$74 billion**

Generation
- $69 billion
- 11 projects

Transmission
- $5.0 billion
- 4 projects

$41.5 billion 7 projects — Hydroelectric

$25.8 billion 2 projects — Nuclear

$1.0 billion 1 project — Wind

$0.7 billion 1 project — Natural Gas

Canada's biggest infrastructure projects are on the line.
Critical schedule, cost and technical risks must be managed.
Deliverables must be met.

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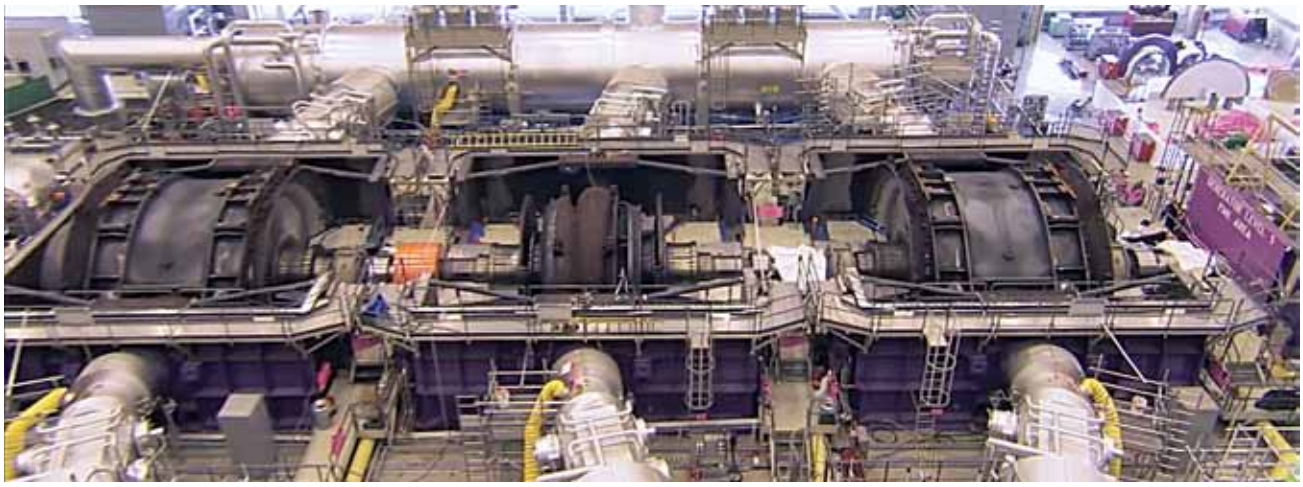

Credit: OPG

2 Darlington Nuclear Refurbishment

$12.8 billion

2018 Rank: 2

Location: Clarington, Ontario

Owner: Ontario Power Generation

Project/Construction Manager: Aecon Group Inc./ SNC-Lavalin JV (execution phase of the Retube and Feeder Replacement)

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

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

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

Funding: Public

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 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 first outage took place in October of 2016, with the first reactor scheduled to be down for 40 months. The overall project is scheduled for 112 months.

In late September, OPG announced that reassembly of Unit 2 is underway, and that planning for the Unit 3 overhaul has commenced.

Funding Source Breakdown

Sector	Total Investment	Federal	Provincial	Municipal	Private
Energy	$74 billion	$4.5 billion	$47.6 billion	–	$21.9 billion
Transit	$60.3 billion	$11.3 billion	$36.9 billion	$9.2 billion	$2.9 billion
Transportation	$35.6 billion	$12.8 billion	$17.1 billion	$2.0 billion	$3.7 billion
Buildings	$29.2 billion	$7.5 billion	$18.0 billion	$0.4 billion	$3.3 billion
Water/Wastewater	$9.1 billion	$1.2 billion	$1.9 billion	$6.0 billion	–
Remediation	$2.2 billion	$2.2 billion	–	–	–
Carbon Capture	$1.2 billion	–	$0.2 billion	–	$1.0 billion
Waste Management	$1.0 billion	–	$1.0 billion	–	–
2019 Top100	**$212.6 billion**	**$39.5 billion**	**$122.7 billion**	**$17.6 billion**	**$32.8 billion**

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With an impeccable safety record, we have completed more than 65% of work at Darlington's Unit 2.

THANK YOU TO OUR COMMITTED TEAMS & TO ALL INVOLVED!

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Credit: Nalcor Energy

3 Muskrat Falls Project

$12.7 billion

2018 Rank: 3

Location: Muskrat Falls, Newfoundland and Labrador

Owner: Nalcor Energy; Emera (Labrador–Island Transmission Link)

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; Pomerleau

Engineer: Nalcor Energy and SNC Lavalin

Financier: TD Securities and Goldman Sachs (co-lead arrangers)

Legal: Cassels Brock & Blackwell (Government of Canada); Dentons (advisor to owner); Fasken Martineau DuMoulin (finance counsel to Nalcor); Gowling WLG (counsel to Emera); McCarthy Tétrault (TD Securities/Goldman Sachs); Borden Ladner Gervais (legal advisor)

Other Key Players: IKC-ONE—Innu Kiewit Constructors, H.J. O'Connell, Neilson, and EBC (rock and overburden excavation); Hatch (engineering services); Golder; Lafarge and Holcim Canada (cement); EY (advising gov't.); Aon Risk Solutions (risk/insurance advisor to authority); KPMG (advisory services); EXP (quality control work); CRT Construction (subcontractor for concrete installation); Morrison Hershfield; AGAT Laboratories; Wood PLC

Suppliers: Lafarge and Holcim Canada (cement); GE (transformers, rotors, and stators); Mammoet; McKeil Marine; Canam Group

Funding: Public/Private

Nalcor Energy leads this development, which includes construction of an 824-megawatt hydroelectric generating facility at Muskrat Falls on the lower Churchill River in Labrador and more than 1,600 kilometres of associated transmission lines and infrastructure that will deliver electricity to Newfoundland and Labrador.

The Government of Newfoundland and Labrador sanctioned the Muskrat Falls Project in December 2012, and construction of the project began in January 2013. Construction has started as planned on all major work sites for the project, including Muskrat Falls, Soldiers Pond, Churchill Falls, the Strait of Belle Isle, and the transmission routes.

Once completed, the project will provide sustainable energy production for residential, commercial, and industrial growth throughout Newfoundland and Labrador in the coming decades.

The energization of the new transmission assets occurred in the second quarter of 2018, including the 1,100-kilometre Labrador-Island Link. Concrete pouring of the North Dam is progressing, and concrete and steel work for the water passages to the turbines have been completed.

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Credit: BC Hydro

4 Site C Clean Energy Project

$10.7 billion

2018 Rank: 4

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.

Other Players: Petrowest Construction (site preparation work); WSP Canada (surveying work); Helical Pier Systems (pile work); Northern Geo (compaction testing); Bennett Jones (acted for successful proponent)

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)

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); Associated Engineering (owner's team—design)

Environmental Services: Golder (EA and permitting, archaeology, agriculture, fisheries and aquatics, socioeconomics); 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

Turbine Supplier: Voith Hydro (turbine and generator)

Legal: Dentons Canada (owner's counsel); Borden Ladner Gervais (legal advisor)

Other Key Players: AL Sims and Sons (road improvements); Aon Risk Solutions (insurance broker to authority); 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 Group Inc.; 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 (QA) services); Colliers Project Leaders; AGAT Laboratories; Wood PLC

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

Funding: Public

- **Provincial** BC Hydro: $10.7 billion

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.

The project's rigorous environmental assessment was completed in October 2014 and approval granted after numerous consultation meetings, presentations, and events with the public, Aboriginal groups, and local governments. Preliminary engineering work has been done, including the development of plans for construction access roads, clearing plans, construction materials, geotechnical shoreline investigations, and reviews of highway realignment plans.

In 2017, the new NDP-Green coalition government called for an independent review of the Site C project by the B.C. Utilities Commission to determine if it should be continued, delayed, or cancelled outright. As a result of the delays caused by the investigation, BC Hydro president and CEO Chris O'Riley announced that the project cost had risen by $610 million. The total forecast project cost now sits at $8.945 billion, with the additional project cost set aside as a contingency fund. The increased cost was associated with the inability to meet the timeline of river diversion in 2019. However, it was determined that the project completion deadline of November 2024 was still attainable.

In September of 2018, BC Hydro announced that it had selected the new alignment for the Highway 29 redesign. As a result of the construction of the Site C project, the highway has to be realigned in six locations across a 30-kilometre span. Construction works for this project are expected to commence in 2020.

Congratulations to our clients and your Top 100 Infrastructure Projects!

- Roberts Bank Terminal 2 Project
- Site C Clean Energy Project

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Credit: EllisDon

5 Eglinton Crosstown LRT

$9.1 billion

2018 Rank: 5

Location: Toronto, Ontario

Owner: Metrolinx

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)

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

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)

Management Consultants: Infrastructure Ontario; Metrolinx; SEG Management Consultants (fairness advisor); EY (transaction advisor); BMO Capital Markets (financial advisor); Aon Risk Solutions (insurance advisor)

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

Other Key Players: AECOM (consulting engineer, preliminary planning/study, design); Aon Risk Solutions (risk/insurance advisor to authority); 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 seven 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); GAT Laboratories; Comtech (consulting services); Wood PLC; Rider Levett Bucknall

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

Funding: P3

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 signalling 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.

In August of 2017, the project reached a major milestone with the laying of the first piece of track, part of a turnout track connecting Mount Dennis station with the storage and maintenance facility. Construction of the Eglinton maintenance and storage facility (EMSF) at Black Creek Drive achieved substantial completion in October of 2018 and vehicle readiness followed a month later, in anticipation of the first vehicle delivery.

The overall project's construction is scheduled to be completed in 2021.

Eglinton Crosstown LRT
Toronto, ON, Canada

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Credit: Manitoba Hydro

Credit: EllisDon

6 Keeyask Hydroelectric Project

$8.7 billion

2018 Rank: 6

Location: Lower Nelson River, Manitoba

Owner: Keeyask Hydropower Limited Partnership

Project/Construction Manager: Manitoba Hydro (acting as project manager and will operate plant on behalf of KHLP once completed); Tetra Tech (construction management support)

Contractor: BBE Hydro Constructors Ltd.—Bechtel, Barnard, and EllisDon

Engineer: SNC-Lavalin; Hatch (engineer); KGS Group; AECOM

Legal: Fasken Martineau DuMoulin (advised Manitoba Hydro); Borden Ladner Gervais (legal advisor)

Other Key Players: Aon Risk Solutions (risk/insurance advisor to authority); Golder (info mgmt. solution services); Hanscomb (owner's cost consultant and special advisor); Boston Consulting Group (capital project analysis); Englobe (quality assurance inspection services); WSP (construction surveying); Wood PLC

Supplier: Voith Hydro

Funding: Public

- **Provincial** Provincial/First Nations Keeyask Hydropower Limited Partnership (co-owned by Manitoba Hydro and Keeyask Cree Nations): $8.7 billion

This 695-megawatt hydroelectric generating station will be a source of renewable energy, producing an average of 4,400 gigawatt-hours of electricity each year. The scope of work includes rock excavation, concrete for the powerhouse and spillway, earthen structures, electrical and mechanical work, and the construction and removal of temporary cofferdams needed to manage the river flow during construction.

Energy produced will be integrated into Manitoba Hydro's electric system for use in Manitoba and for export. Keeyask will be Manitoba's fourth-largest generating station. The design for the project agreement is based on a partnership model between Manitoba Hydro and the four Keeyask Cree Nations, including the Tataskweyak Cree Nation, War Lake First Nation, Fox Lake Cree Nation, and York Factory First Nation.

The past year focused on several key milestones important to the project's progression, including the completion of earthworks to support river diversion, and the enclosure of powerhouse units 4 and 5. It is expected that, for the calendar year 2018, 105,000 cubic metres of concrete will have been poured.

Construction began in summer 2014. The station's first unit is scheduled to go into service in the fall of 2020 thanks to solid gains the previous winter.

Environmental Engineering

Geotechnical Engineering

Pavement Engineering and Management

Materials Quality Control Testing

Quality Manufacturing

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Credit: Hydro-Québec

7 Romaine Complex

$6.5 billion

2018 Rank: 7

Location: Havre-Saint-Pierre, Quebec

Owner: Hydro-Québec

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

Contractor: 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-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

Turbine Supplier: Romaine-1: Voith Hydro

Romaine-3: GE Energy (formerly Alstom)

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

Supplier: Les Excavations Marchand et Fils (cement)

Funding: Public
- **Provincial** Hydro-Québec: $6.5 billion

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 of 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.

Romaine-4 is expected to be online in 2020.

2019 Top100 Project Delivery

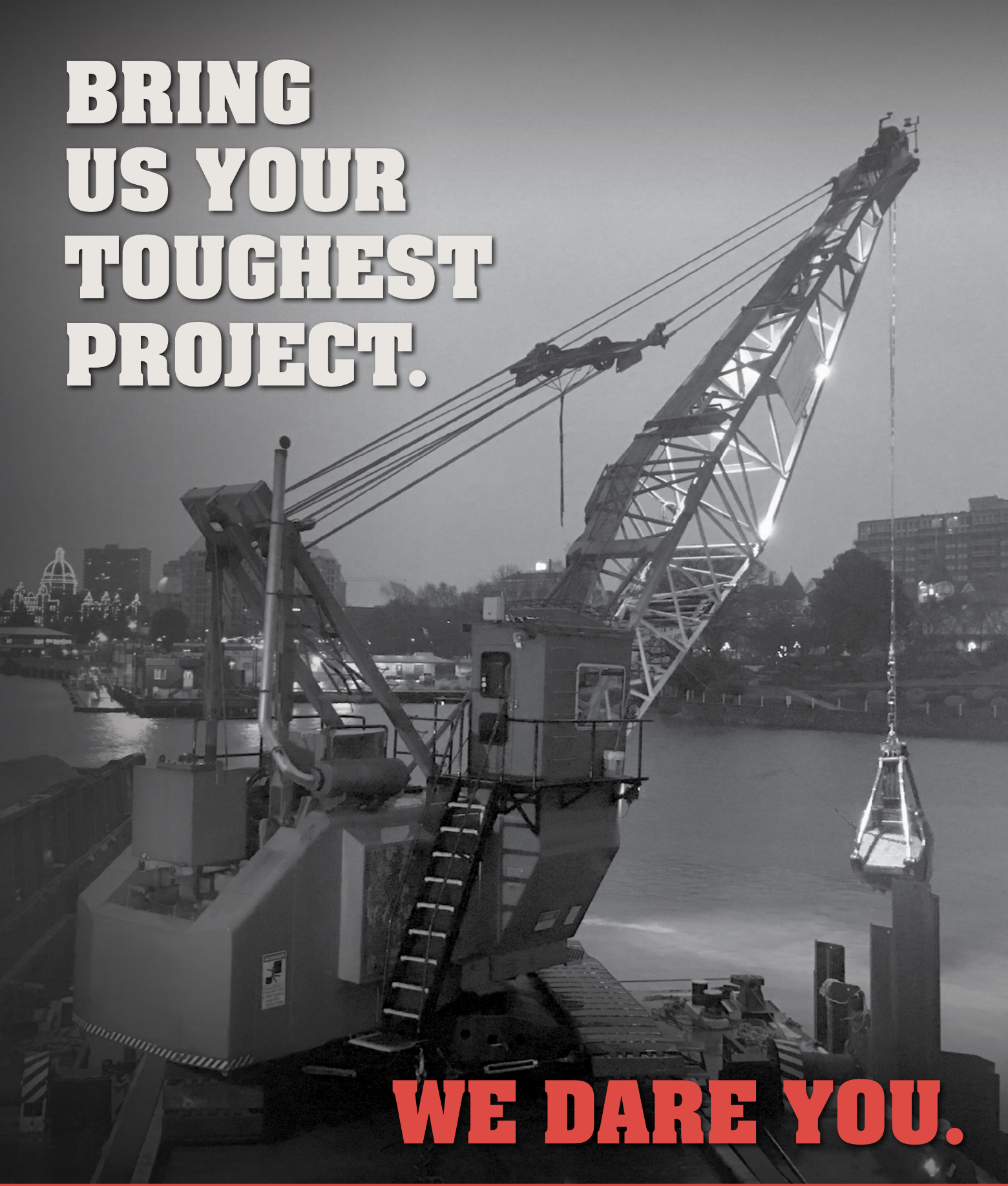
Total Investment: $212.6 billion

58 Public **$106 billion** (49.9% of list value)

27 Public-Private Partnerships **$62.1 billion** (29.2% of list value)

12 Public/Private **$28.4 billion** (13.3% of list value)

3 Private **$16.1 billion** (7.6% of list value)



Milestone
ENVIRONMENTAL CONTRACTING INC.

MilestoneEnv.ca

Photos: CDPQ Infra

8 Réseau express métropolitain

$6.3 billion

2018 Rank: 8

Location: Montreal, Quebec

Owner: Caisse de dépôt et placement du Québec

Contractor: Engineering, procurement, and construction contract: Groupe NouvLR; SNC Lavalin Grands Projets Inc.; Dragados Canada Inc.; Groupe Aecon Québec Ltée; Pomerleau Inc.; EBC Inc.

Conception: SNC Lavalin Inc.; Aecom Consultants Inc.

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

RSSOM Contract: Groupe des Partenaires pour la Mobilité des Montréalais: Alstom Transport Canada Inc.; SNC-Lavalin O&M Inc.

Engineer: CIMA+; Hatch

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)

Other Key Players: Hanscomb (advisory services for design, engineering, and costing); EXP (feasibility and diligence studies); WSP (geotechnical); Aon Risk Solutions; GHD (geotechnical/testing)

Funding: Public-Private

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 km), 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 kilometres—20 hours a day—seven days a week
- This constitutes Québec's first "public-public" partnership project

Construction of the line began in April of 2018, following the contract award two months earlier.

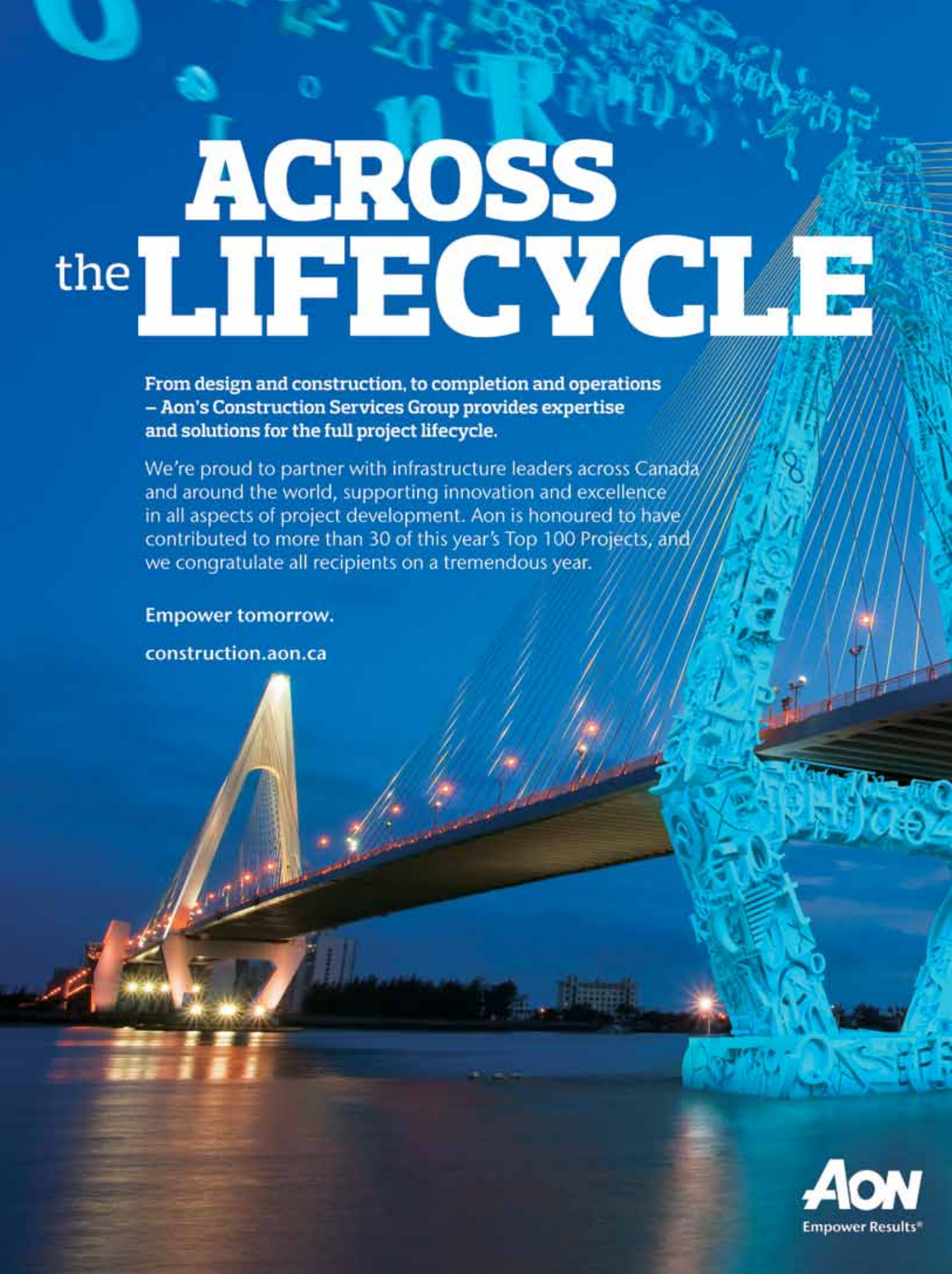
This project also represents the first in Canada that has received an investment through the Canada Infrastructure Bank, following receipt of a 15-year, $1.283-billion loan in August.

Financing

In 2017, both the provincial and federal governments pledged $1.283 billion to the project. The federal government pledge has transformed into a 15-year senior secured loan from the Canada Infrastructure Bank. ARTM and Hydro Québec have also contributed to the project, with $512 million and $295 million respectively being provided for the project. CDPQ Infra has committed $2.95 billion to the project.

Transit Expansion

The Top100 includes **$60.3 billion** invested in **LRT**, **rail**, **subway**, and **BRT** infrastructure.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Photos: WDBA

9 Gordie Howe International Bridge

$5.7 billion

2018 Rank: 21

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, a division of Aecon Construction Group Inc.; 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., an AECOM company

Engineer: Morrison Hershfield (PDC consultant); Davis Langdon (an AECOM company); Parsons (owner's engineer)

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

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 Solutions; Parsons (bridge technical advisor); Tetra Tech; Rider Levett Bucknall (RLB)

Supplier: Entro (signage and wayfinding)

Funding: P3

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.

Both the formation of the WDBA (a Canadian Crown corporation) and the international authority was announced in July 2014. The first phase of construction, including construction of a perimeter access road at the Canadian Port of Entry (POE), utility relocations, and advance fill placement, was ongoing in 2016.

In July of 2018, Bridging North America was named as the successful proponent for the project. Financial close was reached at the end of September. The new date for substantial completion is late 2024.

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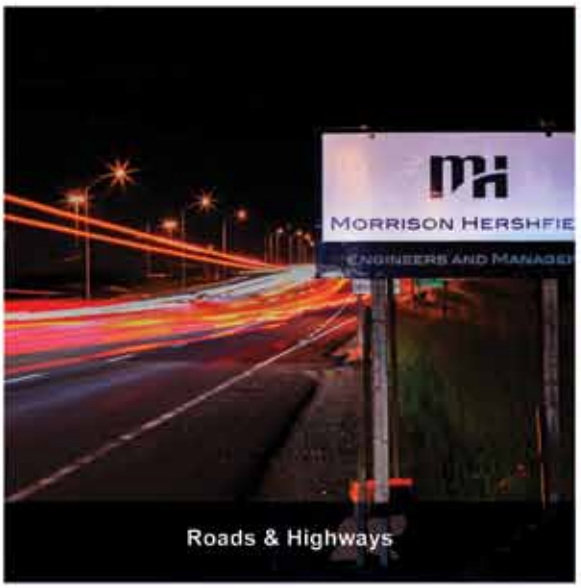

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Credit: Mountain View Partners

10 Southwest Calgary Ring Road

$5 billion

2018 Rank: 10

Location: Calgary, Alberta

Owner: Alberta Transportation

DB(F)O Team: Mountain View Partners—Meridiam, Kiewit, Ledcor, Connor Clark and Lunn (project lead); Meridiam (financing lead); Kiewit, Graham, Ledcor (design-construction lead); Alberta Highway Services Ltd. (O&M lead)

Contractor: KGL Constructors (Elbow River bridge)

Engineer: Jacobs (owner's engineer); COWI North America (concept design of highway interchange structures); ISL Engineering and Land Services (owner's engineer); Tetra Tech (owner's engineer)

Legal: Gowling WLG (counsel to Alberta Transportation); Borden Ladner Gervais (legal advisor); Torys (lenders to MVP); Osler

Other Key Players: EY; LeighFisher (lenders technical advisor); WSP (functional planning and preliminary eng. services); Aon Risk Solutions (risk advisor/broker for preferred proponent); INTECH Risk Management (insurance advisor); Golder; Englobe (concrete quality control); EXP (geotechnical); ARUP (technical advisory services); Morrison Hershfield (structure design review); Parsons; GHD (dust & air monitoring); Wood PLC; McElhanney

Funding: P3

- **Federal** National Infrastructure Component of the New Building Canada Fund: up to $582.9 million (confirmed July 2016)
- **Provincial** Alberta Transportation: around $4.4 billion

In May 2015, a historic land transfer between Alberta and the Tsuu T'ina Nation was finalized, providing certainty that the construction of the southwest segment of the Calgary Ring Road could go forward. This will extend from Lott Creek Boulevard on Glenmore Trail/Highway 8 south to Macleod Trail (Highway 2A) and is approximately 21 kilometres long. The project will also include approximately 10 kilometres of connector road upgrades.

Work got underway in the spring on three integration projects: Glenmore Trail Widening and Interchange Improvements, 90 Avenue S.W. and Southland Drive Connections, and Bow Trail Widening and Intersection Improvements.

The road remains on schedule to open in late 2021.

Expanded Transportation Network

1,160.4 km Rehabilitated Roads

103.4 km New Roads

7.1 km New Bridges

Transportation projects on the 2019 Top100 Projects list represent **1,270.9 km** in new, expanded, and rehabilitated roads across Canada


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Credit: City of Calgary

11 Green Line LRT

$4.87 billion

2018 Rank: 11

Location: Calgary, Alberta

Owner: City of Calgary

Engineer: Hatch

Consulting Architect: Sturgess Architecture, IBI Group

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

Other Key Players: Colliers Project Leaders; CIMA+; RLB

Funding: Public

- **Federal** Public Transit Fund: $1.53 billion
- **Provincial:** $1.68 billion
- **Municipal:** $1.56 billion over 30 years

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.

While procurement for Stage 1 of the Green Line LRT continues, the City of Calgary is moving forward with enabling works construction, supported by $250 million in combined provincial and federal funding.

The current project schedule calls for construction to begin in 2020, with a completion date of 2026.

12 Parliamentary Precinct Rehabilitation Project

$4.7 billion

2018 Rank: 18

Location: Ottawa, Ontario

Owner: Government of Canada

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

Architect: Arcop/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)

Funding: Public

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 undertaken 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.

The original plan was to have Parliament move to the West Block in time for the fall session, but the timeline has been adjusted to have MPs move in time for the 2018-19 winter session, scheduled to begin on Jan. 28, 2019. Construction of the Centre Block, however, began in the fall of 2018 as scheduled.

To date, the Treasury Board has approved an investment of $4.7 billion 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. The work is expected to take until at least 2027, but could be extended to 2033.

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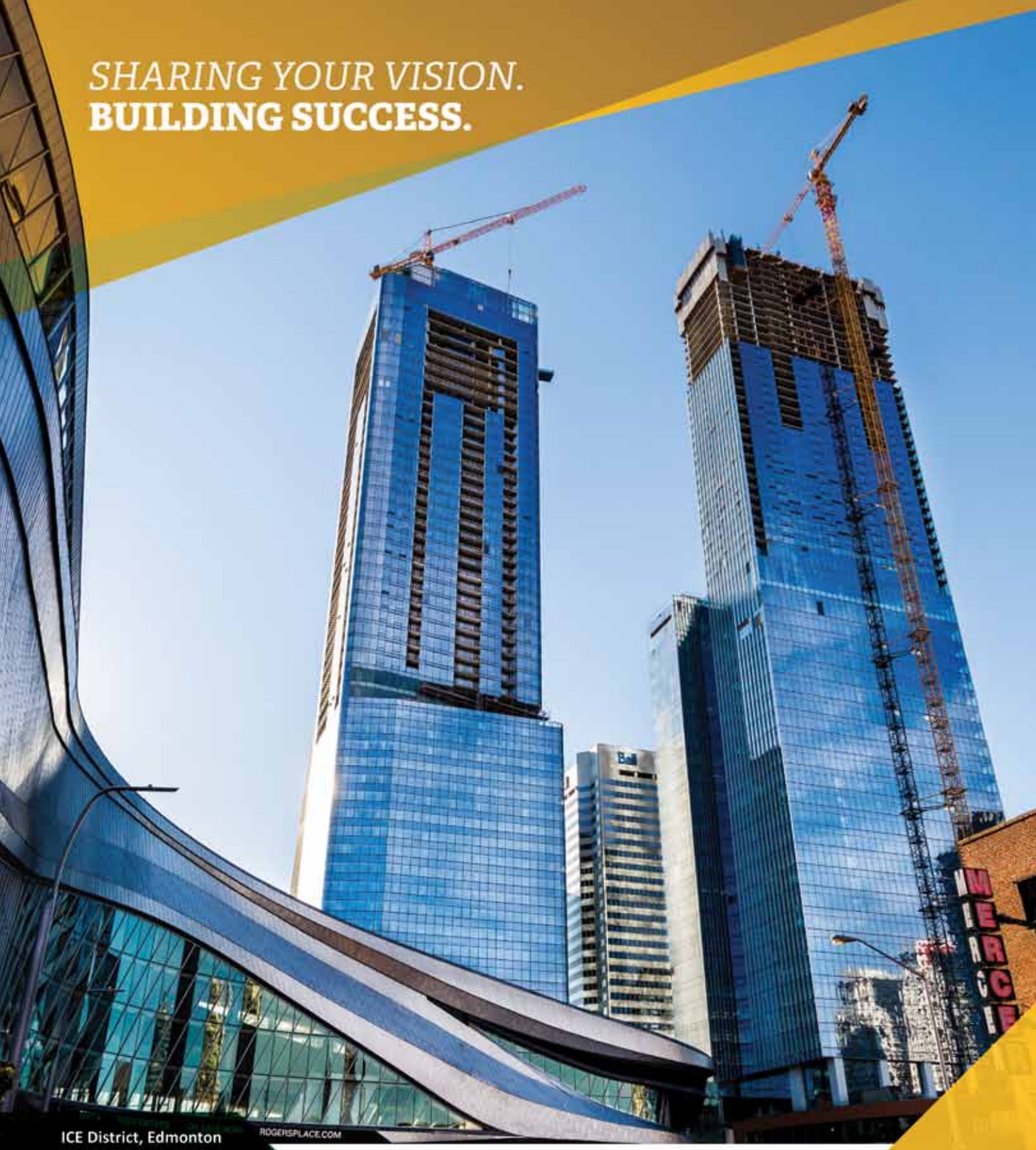

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13 GO Expansion Network Infrastructure

$4.7 billion

NEW

Location: Greater Toronto and Hamilton Area, Ontario

Owner: Metrolinx

Engineer: SNC-Lavalin; CIMA+; Stantec

Other Key Players: 4-Transit JV (technical advisory services): Hatch, Parsons, WSP; Morrison Hershfield; Gannett Fleming; Infrastructure Ontario (procurement lead); Comtech (project mgmt. services)

Funding: Public

Network infrastructure is one of the key components of the expansion of the GO network, which will provide electrified rail service on all corridors. The budget for the network infrastructure includes all works involved in the electrification of the network, as well as the upgrades to signalling that will be required. This project is currently in the design phase, and scheduled for completion in 2025.

Credit: SSLC (Signature on St. Lawrence Construction)

14 New Champlain Bridge Corridor Project

$4.24 billion

2018 Rank: 12

Location: Montreal to Brossard, Quebec

Owner: Infrastructure Canada

DBFOM Team: Signature on the Saint-Lawrence Group—SNC-Lavalin, ACS Infrastructure, HOCHTIEF PPP Solutions, Dragados, Flatiron, WSP, T.Y. Lin International, International Bridge Technologies, EBC Inc.

Engineer: Arup Canada (engineering advisory services); IBI Group/Roche (owner engineer and electrical); Stantec; Ramboll (project's independent engineer)

Consulting Architect: Dissing + Weitling and Provencher Roy (preliminary designs)

Financiers/Banks: HSBC and National Bank of Canada

Legal: Dentons Canada (advising federal govt.); Borden Ladner Gervais (legal advisor); DLA Piper (Canada); McMillan (legal counsel to the finance parties)

Other Key Players: PricewaterhouseCoopers; Steer Davies Gleave; Morrison Hershfield (business case); Englobe, Consortium Perron; Hudon; Bélanger and Consultants (advisory services to government); Hanscomb (cost consultant and special advisor); EY (advising team); Aon Risk Solutions (risk/insurance advisor to private partner); INTECH (insurance advisor); GHD (inspection and testing services); Englobe (audits); CIMA+; EXP (construction, design, planning, and environmental services); DECAST

Funding: P3

- **Federal:** $4.239 billion

On Oct. 5, 2011, the Government of Canada announced the new Champlain Bridge corridor project, one of the largest infrastructure projects in North America. The corridor-wide project not only includes the new Champlain bridge, but a new Île-des-Soeurs Bridge and reconstruction and widening of the federal portion of Autoroute 15. The new bridge is designed to have three corridors, including two three-lane corridors for vehicular traffic and a two-lane transit corridor capable of accommodating a light rail transit system. The new bridge will also include a multi-use path for pedestrians and cyclists.

In August of 2017, the first phase of steel work on the Jacques Cartier Bridge was completed, marking a major milestone for the project. This phase of the project involved the replacement of four braces and eight bottom chords, while 150 gusset plates and 17 diagonals were reinforced. Also, approximately 100,000 rivets were also replaced with bolts.

In October of 2018, Infrastructure Canada announced that the structure would be in place by the original deadline of Dec. 21, 2018, but that certain finishing works would not be completed until the spring of 2019, and the bridge will officially open to traffic in June of 2019.

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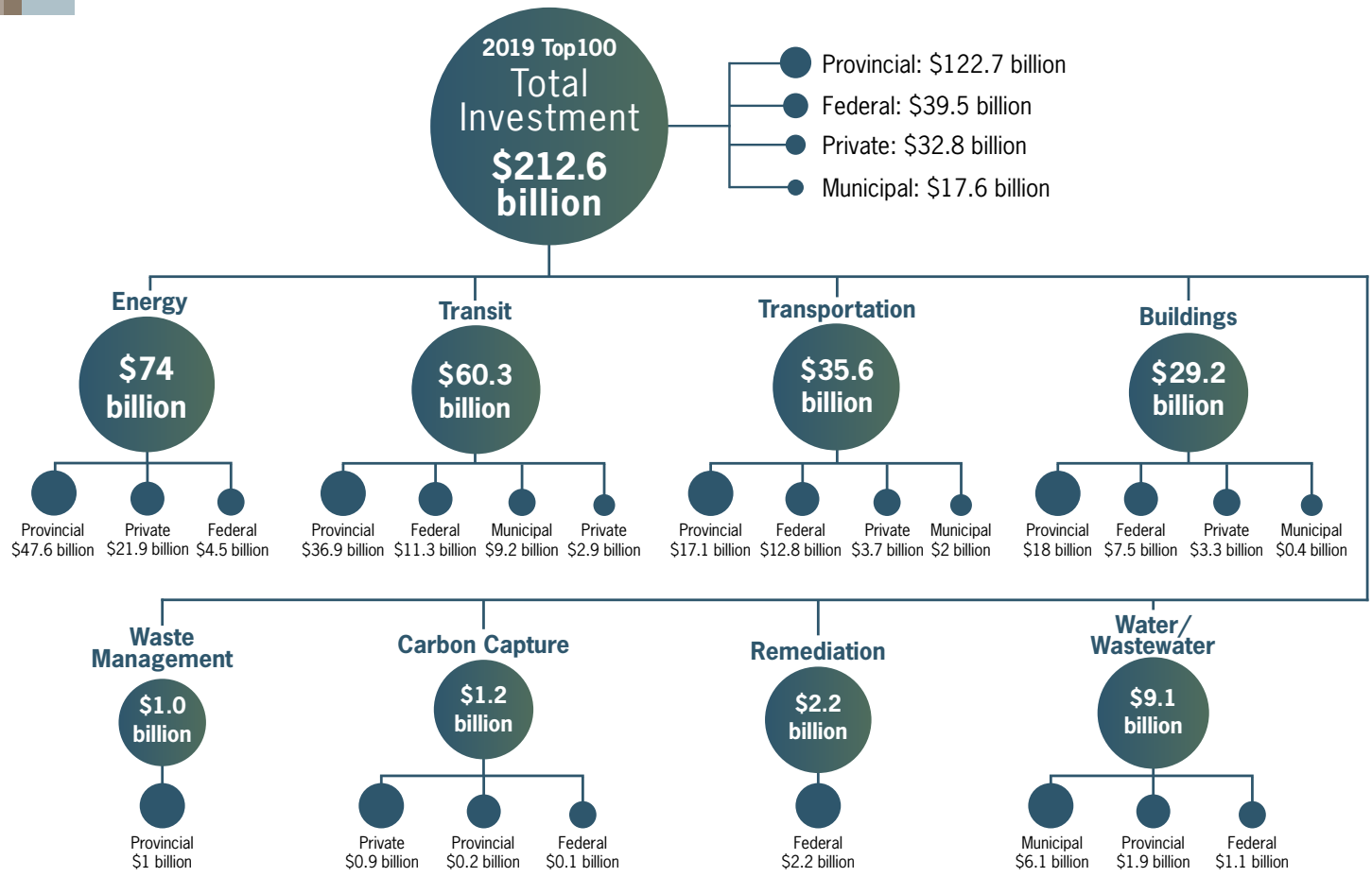

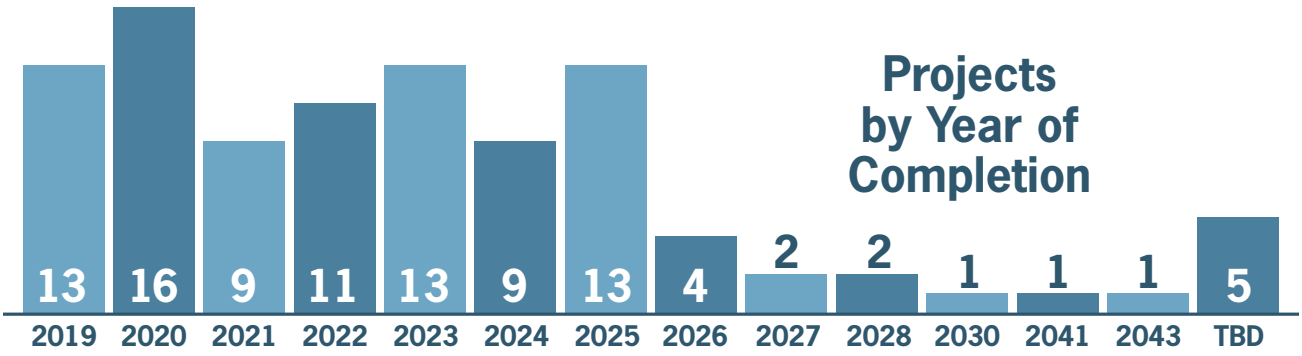

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Top100 Projects PLATINUM ELITE 2019	Top100 Projects PLATINUM 2019	Top100 Projects GOLD 2019	Top100 Projects SILVER 2019	Top100 Projects BRONZE 2019
20 projects or more	10 to 19 projects	6 to 9 projects	3 to 5 projects	2 projects

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15 Blue Line Extension

$3.9 billion

NEW

Location: Montreal, Quebec

Owner: Société de transport de Montréal

Project Manager: ARTM

Other Key Players: EXP (JV for engineering services)

Funding: Public

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 April of 2018, Prime Minister Justin Trudeau announced his support for the project, including an initial investment of $16 million to help develop the business case for the project.

The Quebec Government announced its hopes for a 50-40-10 funding split for the extension project, however the exact commitments were not confirmed prior to the onset of the provincial election in the fall. Should funding commitments arrive in on time, tenders for construction work will be released in 2020.

Credit: KPH Turcot

16 Turcot Interchange

$3.67 billion

2018 Rank: 13

Location: Montreal, Quebec

Owner: Transports Québec

Project/Construction Manager: AECOM and BPR-Batiment

Design-Build Team: KPH Turcot—Kiewit, Parsons, WSP, and Holcim Canada

Engineer: Consortium Génivar/Dessau; Consortium Inspec-Sol inc./EXP; CIMA+; Dessau; Inspec-Sol inc.; Englobe (environmental, geotechnical and materials engineering); WSP (independent engineer); Tetra Tech (part of owner's engineer team); Hatch (rail engineer)

Contractors: Axxys Construction; CMS Entrepreneurs généraux; Construction Demathieu & Bard; Construction DJL; Construction Garnier; DB-AECOM Pont Saint-Jacques S.E.P.; Demix Construction; Demvar; EBC Inc.; Entreprises de construction Panzini; Excavation Loiselle & Frères; Golder Construction; Groupe Hexagone, S.E.C.; Groupe TNT; Hulix Construction; Jacques Arsenault Asphalte; L.A. Hébert Ltée; Lanco Aménagement; Les entreprises Claude Chagnon; Les Grands Travaux Soter; Les services de construction Demo Spec; Les services environnementaux Delsan-A.I.M.; Louisbourg SBC; Pomerleau; Simard-Beaudry Construction; Tesco 3000; SPG Hydro International; TNT2

Environmental Services: Consortium Dessau-Soprin/Les Consultants S.M. (environmental impacts study); Dessau-Soprin (environmental study and decontamination); Groupe Qualitas (environmental study); EXP (environmental study); Amphibia-Nature (environmental study on brown grass snake); Séti Media (environmental study); Tecsult

Financiers/Banks: PricewaterhouseCoopers

Legal: Dentons Canada (legal counsel, under the authority of the Societé québécoise des infrastructures)

Other Key Players: WSP (designer, environmental, geotechnical work); Arup (technical advisor, independent certifier); AOR (geotechnical study); Axor experts-conseils (site supervision); Coentreprise Groupe Qualitas/Englobe-Technisol (geotechnical study); ConsultRail (study on railway equipment); Daniel Arbour & associés, S.E.N.C. (study on highways); Ethnoscop (archaeological studies); Génius Conseil (site supervision); Les Conseillers Adec (economic study); Patrimoine Experts S.E.N.C. (archeological excavations); Raymond Chabot Grant Thornton & Cie (assurance and guarantees); Trimax Sécurité (site supervision); Aon Risk Solutions (insurance broker); GHD (geotechnical design/materials); Englobe (audits)

Supplier: Canam Group (steel superstructure and components)

Funding: Public

- **Provincial:** $3.67 billion

The Turcot Interchange is a major traffic hub in the Montreal area, connecting Autoroutes 15, 20, and 720, and facilitating access to the Champlain Bridge. It is also a vital link between the Montreal Pierre-Elliott-Trudeau International Airport and downtown. The final plans for the reconstruction of the deteriorating expressway interchange include more space allocated to public transit, cyclists, pedestrians, and green space. Several bus-only lanes have been reserved along Highway 20, Notre Dame Street West, and St. Patrick Street.

Construction of the new interchange reaches several milestones in 2018, with completion of the new configuration of A-20 East and the dismantling and new configuation of A720 West. The project is expected to be completed on schedule by 2020.

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Credit: ReNew Canada

17 Centre hospitalier de l'Université de Montréal (CHUM) and Research Centre

$3.63 billion

2018 Rank: 14

Location: Montreal, Quebec

Owner: Centre hospitalier de l'Université de Montréal

Project/Construction Manager: Groupement SLDG, led by SNC-Lavalin

Research Tower DBFM Team: Accès Recherche Montréal—Pomerleau and Verreault, a subsidiary of Dessau.

Hospital DBFM Team: Collectif Santé Montréal—Laing O'Rourke, Obrascón Huarte Lain, Innisfree, and Dalkia Canada

Contractor: EBC Inc.

Engineer: AECOM; Consortium Pageau Morel, BPR Bâtiment, LBHA, and SDK NCK (Research Centre); HH Angus, Pasquin St-Jean, and Groupe SMi International (Hospital)

Financiers/Banks: Research Centre: Axium Infrastructure and Meridiam Infrastructure; Hospital: Innisfree (30%), Laing O'Rourke (25%), Obrascon Huarte Lain (25%), Dalkia Canada (20%), and RBC Dominion Securities (underwriter)

Consulting Engineer: Tetra Tech (mechanical/electrical engineering)

Architect: Research Centre: NFOE et Associés, Menkès Shooner Dagenais LeTourneux, Jodoin Lamarre Pratte (sub-consultant), Lemay et Associés, Parkin Architects; Hospital: Cannon Designs, NEUF Architectes

Legal: Research Centre: Blake, Cassels & Graydon; Hospital: Fasken Martineau DuMoulin (advised authority), Lavery, de Billy (legal counsel); Blake, Cassels & Graydon (legal advisor); Gowling Lafleur Henderson (repped consortium); McCarthy Tétrault (advised RBC); Stikeman Elliott (repped Dalkia); Raymond Chabot Grant Thornton (financial and process advisor); Dentons Canada (legal advisor)

Other: BTY Group (lenders technical advisor); Hatch (independent certifier); Hanscomb (mechanical and electrical cost consultant and special advisor); INTECH Risk Management (insurance advisor); Société québécoise des infrastructures; SNC-Lavalin, WSP (owner's advisor); Colliers Project Leaders; GHD (geotechnical & materials); EXP (MEP services)

Supplier: Demix Beton (concrete)

Funding: Public/Private

A new hospital and research centre will replace the three facilities that currently make up the Centre hospitalier de l'université de Montréal (CHUM): Hôtel-Dieu in Montréal, Notre-Dame Hospital, and Saint-Luc Hospital. The project received the go-ahead in 2010, which brings all three francophone university hospitals together under one roof.

Phase one, construction of the research centre, was opened in the fall of 2013. Phase two of the project, three 25-storey buildings that will each house therapeutic and hospital diagnostic services, emergency, and clinical follow-ups as well as clinical and logistical support, welcomed its first patients in early October of 2017. Phase three of the project, now underway, consists of the construction of an adjacent building to accommodate part of the outpatient clinics, clinico-administrative offices, library, archives, a 500-seat amphitheatre, and another parking section. Phase three is scheduled for completion in the spring of 2020.

18 Ottawa LRT – Stage 2

$3.6 billion

2018 Rank: 17

Location: Ottawa, Ontario

Owner: City of Ottawa

Engineer: McMillenJacobs Associates (owner's tunnel engineer); Morrison Hershfield (owner's engineer); Golder (owner's engineer team); Parsons

Legal: Borden Ladner Gervais (legal advisor); Norton Rose Fulbright (advisor for project owner); Osler; Torys (acted for lender)

Other Key Players: EXP (instrumentation and monitoring); Hanscomb (owner's cost consultant and special advisor); Aon Risk Solutions (owner advisor and construction insurance broker); INTECH Risk Management (insurance advisor); AECOM (owner's representative); GHD (testing, inspection, and geotechnical services); Golder; Enstoa; SNC-Lavalin; WSP (geotechnical)

Supplier: DECAST Ltd.

Funding: P3

Credit: City of Ottawa

Ottawa's mayor, council, and representatives from the city's business, tourism, and academic communities officially launched the Ottawa LRT Stage 2 funding request to the federal and provincial governments. Stage 2 will further reduce commute times by adding 19 new stations and 30 kilometres of rail to Ottawa's O-Train system between 2018 and 2023. It was recently confirmed through EA work it can be constructed within the $3-billion budget established in the city's 2013 Transportation Master Plan.

The project will:

- Extend the Confederation Line east from Blair to Orléans, with stations at St. Joseph, Jeanne D'Arc, Orléans Drive, and Place d'Orléans;
- Extend the Confederation Line west to Algonquin College and Bayshore, with stations at Westboro, Dominion, Cleary, New Orchard, Lincoln Fields, Queensview, Pinecrest, Iris, Baseline, and Bayshore; and
- Extend the O-Train to Riverside South and Bowesville, with a new station at Gladstone, and stations at Walkley, South Keys, Leitrim, and Bowesville.

In May of 2018, the Government of Ontario announced an additional $50-million contribution to fund the anticipated $80-million cost of the 3.4-kilometre extension from Earl Armstrong/Bowesville Station to a new terminus station approximately 200 metres west of Limebank Road in the future Riverside South Town Centre community. The additional $30 million needed for this extension will be secured through the introduction of an area-specific development charge.

When completed in 2023, Stage 2 would bring the LRT to within five kilometres of almost 70 per cent of residents. Construction is slated to begin in the summer of 2019.

19 Scarborough Subway Extension

$3.56 billion

2018 Rank: 16

Location: Scarborough, Ontario

Owner: TTC

Project Manager: Scarborough Link Joint Venture—Parsons, Hatch, WSP

Contractor: Hatch (tunnel design); WSP (systems design and management); AECOM (station design)

Environmental Services: AECOM

Other Key Players: Aon Risk Solutions (risk/insurance advisor to authority); EY (advising gov't.); Golder (owner's consultant); Hanscomb (station designer's cost consultant); Englobe (geotechnical investigation); AGAT Laboratories; Comtech (property consulting services); Wood PLC

Funding: P3

Credit: AECOM

The Scarborough Subway Extension is a six-kilometre extension of Toronto's Line 2 subway system, providing a direct link from Kennedy Station to Scarborough Centre. The new line will run along the McCowan corridor, with the new station located on the west side of McCowan Road between Triton Avenue and Progress Avenue. The project also includes a new bus terminal to link subway riders to local and regional bus routes.

Originally, the Scarborough transit project had been designed as a seven-stop light rail transit system, and had received funding from both the federal and provincial government. The funding envelope, including the contribution from the municipality, sat at $3.56 billion, just over $200 million more than the current anticipated cost of the one-stop subway.

In July of 2018, station designs were presented to the City of Toronto's Design Review Panel for consideration.

20 Millennium Line Broadway Extension

$2.83 billion

NEW

Location: Vancouver, British Columbia

Owner: TransLink

Other Key Players: Golder

Funding: Public

Financing

The Government of Canada announced an investment of $888.4 million in the project. The provincial government has provided a $1.82-billion contribution, while the City of Vancouver has provided an in-kind donation of $99.8 million. The final component is $17 million, which will come from the Phase 1 Mayors' Vision plan.

Credit: TransLink

The Broadway Extension project will see the addition of six underground stations and 5.7 kilometres of track to the Millenium Line. The extension will run from VCC-Clark Station to Arbutus Street. The line will replace the existing B-line bus service, increasing transit capacity in the corridor by 250 per cent.

In September of 2018, the provincial and federal governments announced more than $3 billion in funding for both this and the Surrey LRT project.

The current construction schedule calls for the extension to open to the public in 2025.

21 Finch West LRT

$2.5 billion

2018 Rank: 47

Location: Toronto, Ontario

Owner: Metrolinx

Project/Construction Manager: Parsons (project management, engineer, and environmental assessment); Infrastructure Ontario

DBFM Team: Mosaic Transit Partners–ACS Infrastructure Canada Inc.; Aecon Concessions—a division of Aecon Construction Group Inc.; CRH 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.

Financial Advisor: RBC Dominion Securities Inc.

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

Consulting Engineer: WSP (geotechnical consultant)

Vehicle Supplier: Bombardier

Credit: TTC

Legal: Norton Rose Fulbright

Other Key Players: AECOM (technical advisor); Aon Risk Solutions (risk/insurance advisor to authority); EY (advising gov't.); Infrastructure Ontario (managing procurement/construction); 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

Supplier: Dufferin Concrete; DECAST (precast infrastructure)

Funding: P3/AFP

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.

In April of 2018, Metrolinx and Infrastructure Ontario announced that the Mosaic Transit Group had been chosen as the preferred proponent for the project. However, just one week after the announcement, Metrolinx stated that, based on the construction schedule submitted by Mosaic, the project would be completed by 2023, one year later than had been announced in the fall of 2017. Construction got underway in the summer of 2018.

22 Hospital for Sick Children

$2.4 billion

NEW

Location: Toronto, Ontario

Owner: Hospital for Sick Children

Engineer: Entuitive (structural); TMP (mechanical); MBII (electrical)

Architect: B + H

Funding: Public

In October of 2017, the Hospital for Sick Children announced its plan for a $1.3-billion fundraising campaign, the largest in Canadian health care history. Of the $1.3 billion, $600 million of that was dedicated to the construction of a new patient care centre on University Avenue in downtown Toronto.

In March of 2018, then-Ontario Premier Kathleen Wynne announced the provincial government would commit $2.4 billion to the design and construction of a massive redevelopment of the hospital, including the construction of the aforementioned patient care centre.

The project is currently in the design phase.

Credit: City of Toronto

23 F.G. Gardiner Expressway Strategic Rehabilitation Plan

$2.3 billion

2018 Rank: 19

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

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

Other Key Players: Ernst & Young, Hanscomb, and HDR (advisory support); Aon Risk Solutions (owner advisor and construction insurance broker)

Funding: P3

- **Federal:** $820 million (anticipated)
- **Municipal:** $1.75 billion

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 June of 2018, Aecon was awarded a $308.5-million contract for Phase 1 of the project between Cherry Street and Jarvis Street.

24 81–141 Bay Street

$2 billion

2018 Rank: 24

Location: Toronto, Ontario

Owner: Metrolinx and Ivanhoé Cambridge

Contractor: EllisDon (general contractor)

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

Legal: Torys (representing project owner)

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, geotech./env. work); Cushman & Wakefield

Funding: Public/Private

- **Provincial** Metrolinx: around $100 million
- **Private** Ivanhoé Cambridge: around $2 billion

The Bay Street project 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.

Steel and concrete works at 81 Bay Street continued throughout 2018, with the concrete core of the building rising at 1.5 storeys per six work days during peak periods. The final two super steel columns on the west side were installed in September.

Phase 1 of the project—81 Bay Street—is scheduled for completion 2020. Phase 2, construction of 141 Bay Street and the elevated park, is set to be complete in 2023.

25 Don River and Central Waterfront Wet Weather Flow System & Connected Projects

$2 billion

NEW

Location: Toronto, Ontario

Owner: City of Toronto

Contractor: Hatch (outfall tunnel)

Engineer: Morrison Hershfield; Parsons (bridge technical advisor); AECOM

Other Key Players: Golder; Rider Levett Bucknall

Funding: Public

The Don River and Central Waterfront Wet Weather 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.

The Coxwell Bypass Tunnel, as well as the integrated pumping station at the Ashbridges Bay Wastewater Treatment Plant, and new outfall at the plant, are among the first parts to be undertaken within the overall program. Construction of the tunnel is underway now, and is scheduled for completion in 2023. The station project is anticipated to be completed by 2026, and the new outfall by 2025.

26 QEII Redevelopment

$2 billion

NEW

Location: Halifax, Nova Scotia

Owner: Government of Nova Scotia

Project Manager: Nova Scotia Lands

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

Funding: Public/P3

Credit: ReNew Canada

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 primary 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 the fall of 2018, the Government of Nova Scotia announced that the Halifax Infirmary and Bayers Lake projects would be delivered as a public-private partnership using the DBFM model. The RFQ was released in the fall.

27 Roberts Bank Terminal 2 Project

$2 billion

2018 Rank: 25

Location: Delta, British Columbia

Owner: Port Metro Vancouver

Project/Construction Manager: WorleyParsons (project management); WSP (construction management, quality assurance, reporting to the project manager, construction contract administration, geomatic scanning); Hatch (project manager)

Engineer: Parsons

Environmental Services: Hemmera (supporting project planning and leading the EA); WSP (air quality assessment); Golder

Legal: Blake, Cassels & Graydon (counsel to owner); Borden Ladner Gervais (legal advisor); Norton Rose Fulbright (Proponent team in the Terminal Operator RFP)

Other Key Players: Aon Risk Solutions

Funding: Private

- **Private** Port Metro Vancouver (self-sufficient corporation established by the Government of Canada): $2 billion

Financing

Vancouver Fraser Port Authority is a financially self-sufficient corporation established by the Government of Canada in accordance with the Canada Marine Act. Vancouver Fraser Port Authority is funding the initial planning and environmental assessment phase of the proposed project; funding for construction land and terminal equipment will be obtained from private sources through a competitive process.

This is a proposed new three-berth container terminal that would provide additional capacity of 2.4 million TEUs per year to meet the port's forecast demand until 2030. The project would be approximately 5.5 kilometres offshore, northwest of the existing Roberts Bank terminal facilities. The new rectangular terminal would have a berth length of 1,300 metres, long enough for the mooring of three ships, and a width of 700 metres to support terminal components, such as a container storage yard and rail intermodal yard. The existing causeway would also be widened to accommodate road and rail improvements, and the tug basin at Deltaport would be expanded.

As part of the environmental assessment (EA) 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. In 2018, the review panel tasked with the EA was seeking comments on information request responses and draft Public Hearing Procedures, with the comment period running from July to October.

28 Quebec City University Hospital Center – Laval University

$1.97 billion

2018 Rank: 23

Location: Quebec City, Quebec

Owner: CHU de Québec-Université Laval

Engineer: SNC-Lavalin; CIMA+; Stantec

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

Funding: Public/Private

In April of 2017, the Government of Quebec 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. Construction is underway, with Phase 1 of the project set to be complete by the end of 2020.

29 Regina Bypass Project

$1.88 billion

2018 Rank: 26

Location: Regina, Saskatchewan

Owner: Saskatchewan Ministry of Highways and Infrastructure

DBFOM Team: SaskLink Global Transportation Partners—VINCI, Gracorp Capital, Parsons, Graham, Carmacks, McElhanney, Urban Systems, COWI North America, EXP, Clifton Associates, National Bank

Engineer: Associated Engineering (owner's engineer team); EXP (geotechnical design for structures and pavements); Graham (construction lead and concession partner); Morrison Hershfield (ind. structural design certifier); WSP (legal survey for 50 % of bypass)

Financiers/Banks: Graham Capital, Parsons Enterprises, Vinci Concessions, and Connor, Clark & Lunn (equity investors)

Legal: Aird & Berlis (P3 legal advisor); Fasken Martineau DuMoulin (advising lenders to consortium); Norton Rose Fulbright (OMR service provider on a Proponent team); Osler; Torys (representing City of Regina)

Other Key Players: Aon Risk Solutions (risk/insurance advisor to authority); EY (financial and procurement advisor); Golder; INTECH Risk Management (insurance advisor); LeighFisher (ind. certifier); Englobe (quality assurance and pavement life-cycle analysis); CIMA+ (owner's engineer subcontractor); Wood PLC

Supplier: Canam Group

Funding: P3

- **Federal** PPP Canada: $200 million
- **Provincial:** $1.68 billion

This bypass is the largest infrastructure project in Saskatchewan's history. Based on preliminary numbers, this project will have significant economic benefits for the province by creating 8,200 construction-related jobs in Saskatchewan. The project consists of a free flow highway corridor through the Regina region, which includes approximately 58 kilometres of four-lane highway (including 40 kilometres of new highway) and service roads along with 10 new interchanges, and three new intersections. One of the key aspects of the project is integration and management of both existing and new infrastructure during all stages. In March of 2018, the Highway 1 interchange near Pilot Butte opened, only the second diverging diamond interchange in Canada and first in Saskatchewan.

30 Edmonton Valley Line – Stage 1

$1.8 billion

2018 Rank: 27

Location: Edmonton, Alberta

Owner: City of Edmonton

DBFOM Team: TransEd Partners—Fengate Capital Management, Bechtel, EllisDon, Bombardier, Transdev, ARUP, IBI Group

Engineer: ConnectED Transit Partnership—AECOM, Hatch, Mott MacDonald, DIALOG, ISL Engineering and Land Services Ltd., GEC Architecture; Associated Engineering (engineering & environmental services)

Legal: Borden Ladner Gervais (legal advisor); McCarthy Tétrault; Norton Rose Fulbright

Other Key Players: Aon Risk Solutions (risk/insurance advisor to owner); BTY Group (cost consultant); EY (advising team); KPMG (financial and process advisor); LeighFisher (equity O&M advisor); Morrison Hershfield (transit O&M consultant); INTECH Risk Management (insurance advisor); Englobe (quality control); Tetra Tech (geotechnical and environmental services); AGAT Laboratories; Wood PLC

Supplier: Canam Group

Funding: P3

- **Federal** Building Canada Fund: $150 million; PPP Canada: $250 million
- **Provincial** GreenTRIP: $310 million; Building Canada Fund matching: $150 million; interest-free loan: $140 million
- **Municipal:** $800 million

The Valley Line is the largest single infrastructure project in the history of Edmonton. It consists of a 27-kilometre low-floor urban line running from Mill Woods to Lewis Farms that crosses downtown. It will be separate from the city's existing high-floor LRT system. This line will feature modern, low-floor, light-rail vehicles running segregated along existing streets and integrating with Edmonton's surrounding neighbourhoods. The 13.1-kilometre southeast section from Mill Woods to 102 Street (Stage 1) is currently being delivered as a Design-Build-Finance-Vehicles-Operations-Maintenance P3 (public-private partnership). Target service commencement is scheduled for Dec. 15, 2020.

Valley Line Stage 2

The 14-kilometre west portion of the Valley Line will run between downtown and Lewis Farms, servicing Edmonton with direct connections to West Edmonton Mall, Misericordia Hospital, downtown post-secondary campuses, and many new mixed-use developments and mature established neighbourhoods in between. Valley Line West will include 14 street-level stops and two elevated stations. In September 2016, the City of Edmonton received funding through the Government of Canada's Public Transit Infrastructure Fund to update the Valley Line West preliminary design, determine project delivery method, and ultimately ensure the project is ready for construction procurement in 2019. Once additional funding is secured, it is anticipated it would take about one year to select a contractor for the Valley Line West and another five years to complete construction. Valley Line West has a current estimated cost of $2.5 billion.

31 Vancouver International Airport Upgrades

$1.7 billion

2018 Rank: 28

Location: Vancouver, British Columbia

Owner: Vancouver Airport Authority

Project/Construction Manager: Vancouver Airport Authority

Engineer: Stantec; SNC-Lavalin; WSP (materials engineering, quality management)

Architect: Kasian Architecture Interior Design and Planning Ltd.

Contractor: Graham (general contractor for airside operations support building); Ledcor (A-B connector); PCL Constructors Canada Ltd. (secure corridors); Hatch (civil design, construction support services)

Legal: McCarthy Tétrault LLP (represented VIAA)

Other Key Players: BMO Capital Markets (bonds issue); BTY Group (cost consultant); Entro (wayfinding and signage); exp Services (quality management); WSP (materials engineering, quality management); Aon Risk Solutions (owner advisor and construction insurance broker); Mott MacDonald (baggage handling master planner); Hanscomb (airport cost consultant); Colliers project Leaders

Supplier: Canam Group (joists and steel deck)

Funding: Private

- Vancouver Airport Authority: $1.8 billion (collected through an increased airport improvement fee)

The multi-year expansion at Vancouver International Airport (YVR) involves a number of capital construction projects to enhance the airport experience and improve YVR's competitive position as a world-class connecting hub. Current projects include a Central Utilities Building that will house one of Canada's largest GeoExchange energy systems; a new parkade and ground transportation facility; expanded international terminal building with four new bridged aircraft gates; four new bus operation gates; and new remote aircraft stands. Two new international hold rooms with capacity for 600 passengers have just opened and a new transboder hold room is starting construction in October—both will support YVR's remote stand operations. To make room for the new remote aircraft stands, YVR will reclaim a portion of its existing jetSet parking concept and convert the remaining space into a valet operation. Construction on YVR's runway safety enhancements will also continue until 2022.

32 Surrey LRT

$1.65 billion

NEW

Location: Surrey, British Columbia

Owner: TransLink

Contractor: WestPro (Bear Creek Bridge replacement)

Consulting Services: McElhanney Consulting Services and Stewart Group Strategic Consulting

Funding: Public

The Surrey-Newton-Guildwood light rail transit system is an 11-stop, 10.5-kilometre addition to the transit network in the Greater Vancouver Area. The system will run at street level along King George Boulevard. and 104th Avenue, and will offer five-minute frequency during peak hours. With provincial and federal funding confirmed in early September, the project immediately moved to the procurement process with the issuance of a Request for Qualifications. It is expected that the procurement process will be completed in the next 18-24 months in order for construction to begin sometime in 2020.

33 Crowchild Trail Project

$1.65 billion

NEW

Location: Calgary, Alberta

Owner: City of Calgary

Contractor: Graham (Phase 1)

Funding: Public

On May of 2017, the City of Calgary approved the plan for changes and upgrades to Crowchild Trail, as outlined in its Crowchild Trail Study. The renewal and expansion of Crowchild Trail, located west of the city's downtown core, is necessary to improve the life of the current infrastructure, as well as to accommodate future growth. Phase 1 focuses on work around and over the Bow River, including adding a lane of traffic in each direction on the existing bridge, as well as upgrades to the off-ramps already in place.

34 Mackenzie Vaughan Hospital

$1.6 billion

2018 Rank: 42

Location: Vaughan, Ontario

Owner: Mackenzie Health

Project Manager: Infrastructure Ontario

DFBM Team: Plenary Group (Canada) Ltd. (developer); Stantec (design); PCL Constructors Canada Inc. (design builder); Johnson Controls Canada LP (facilities management); Plenary Group (Canada) Ltd. (financial advisor); WSP (construction services for DB team)

Legal: Torys (represented Johnson Controls)

Other Key Players: Hanscomb (hospital's cost consultant); A.W. Hooker Associates (independent certification); GHD (condition assessment remediation); Aon Risk Solutions; Colliers Project Leaders

Supplier: DECAST Ltd.

Funding: Public/Private

Credit: Mackenzie Health

Mackenzie Vaughan Hospital represents the first new hospital built in York Region in the last 30 years. The new hospital will include a state-of-the-art emergency department, advanced diagnostic imaging services, modern surgical services and operating rooms, specialized ambulatory clinics and intensive care beds, and new technology to connect systems with medical devices for optimum information exchange. By late October of 2018, the topping off of the hospital had taken place, and cranes were in place lifting 300 modular washrooms into place on floors four through eight. The hospital continues on schedule, and is expected to open to patients sometime in 2020.

35 Renovations to Beauharnois Generating Station

$1.6 billion

2018 Rank: 29

Location: Beauharnois, Quebec

Owner: Hydro-Québec

Project/Construction Manager: Hydro-Québec Équipement

Contractor: HMI Construction Inc.

Engineer: Stantec, SNC-Lavalin, CIMA+

Turbine Supplier: GE Energy (formerly Alstom) (design, manufacture, and delivery of runners for multiple units); Voith Hydro

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

Funding: Public

- **Provincial** Hydro-Québec: $1.6 billion

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 2019.

36 Wataynikaneyap Transmission Project

$1.6 billion

2018 Rank: 40

Location: Northern Ontario

Owner: Wataynikaneyap Power in partnership with FortisOntario and RES Canada

Engineer: Hatch (owner's engineer)

Environmental Services: Golder (Phase 1 EA)

Consultant: EY

Other Key Players: PowerTel, Deutsche Bank (MOU for design, construction, and financial services); PwC (financial feasibility study and socioeconomic impact analysis); Torys (regulatory overview); Arcadis Canada Inc. (Phase 2 routing study); EY (consultant); Wood PLC

Funding: Public/Private

Wataynikaneyap Power—composed of 22 Northwestern First Nation communities—partnered with FortisOntario and RES Canada in August 2015 to develop and operate the transmission facilities to connect 16 remote reserves to the power grid and transition them away from diesel generation. The plan calls for an 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). In March, the provincial and federal governments unveiled the funding framework for the project. That was followed by the selection of four pre-qualified proponents to receive EPC RFP packages for Phase 1 and 2 of the project in September. The date of selection of the successful proponent has not been released. Potential remote electrification is anticipated in 2022, with build-out to 2024.

37 Kitchener Corridor GO Expansion

$1.534 billion

2018 Rank: 31

Location: Toronto to Kitchener, Ontario

Owner: Metrolinx

Contractor: DBF Team (Highway 401 Rail Tunnel)—EllisDon Capital Inc., STRABAG Inc., EllisDon Civil Ltd., STRABAG Inc.; WSP Canada Inc., Dr. Sauer & Partners, Wood PLC (design)

Legal: Norton Rose Fulbright (advisor to IO)

Other Key Players: 4-Transit JV (technical advisory services): Hatch, Parsons, WSP; CIMA+ (utilities relocation); Golder; Morrison Hershfield; Gannett Fleming; Comtech (program/project consulting); Infrastructure Ontario (procurement lead); Rider Levett Bucknall

Funding: Public

Improvements to the Kitchener GO rail network is one of 10 projects that comprise the $13.5-billion Regional Express Rail redevelopment. The overall project aims at upgrading and improving the rail lines, stations, and technology, as well as the electrification of core segments. Significant improvements to this corridor are needed in order to provide two-way, all-day service between Kitchener and Bramalea GO. Work is currently underway on a multi-level parking structure and Bramalea to accommodate future growth, and the Highway 401/409 tunnel is in the implementation phase.

38 Barrie Corridor GO Expansion

$1.506 billion

2018 Rank: 32

Location: Toronto, Ontario to Barrie, Ontario

Owner: Metrolinx

Contractor: EllisDon (Dufferin Street at Queen Street bridge); Cole Engineering and Kenaidan (rapid pedestrian tunnels)

Other Key Players: 4-Transit JV (technical advisory services): Hatch, Parsons, WSP; Aon Risk Solutions; CIMA+ (utilities relocation); Golder; Morrison Hershfield; Gannett Fleming; Comtech (program/project consulting)

Supplier: Mammoet (crane for precast tunnel placement); DECAST Ltd.; Wood PLC; Infrastructure Ontario (procurement lead); Rider Levett Bucknall

Funding: Public

Credit: ReNew Canada

The $13.5-billion Regional Express Rail (RER) program includes significant improvements to the Barrie GO corridor. The current corridor consists of 11 stations running from the Allandale Waterfront GO station on the shores of Lake Simcoe and Barrie through to Union Station in downtown Toronto. Non-AFP work on the Barrie Corridor includes three contracts. The RFP for the first contract closed in the fall of 2018, and the RFP has been released for the two remaining contracts. Full construction and expansion of the Barrie Corridor is scheduled for completion in 2025.

39 York VIVA Bus Rapid Transit (vivaNext)

$1.5 billion

2018 Rank: 34

Location: York Region, Ontario

Owner: York Region Rapid Transit Corp. and Metrolinx

Project Manager: Kiewit EllisDon partnership (rapidways along Highway 7 between Bayview and Warden avenues in Markham)

York RapidLINK Constructors—Aecon, Dufferin Construction, AECOM, Hatch, Morrison Hershfield, and Leigh Fisher Canada (rapidways along Yonge Street in Richmond Hill and Newmarket)

Program Manager: MMM Group

DBF Team: EDCO—EllisDon Capital Inc. and Coco Paving Inc., IBI Group, LEA Consulting Ltd., Peto MacCallum Ltd. (design, build, and finance rapidways along the Highway 7 transit corridor in the City of Vaughan and Town of Richmond Hill)

Engineer: AECOM; Parsons; KED; McCormick Rankin Corp.; MMM Group (engineer and program manager); Ecoplans Ltd.; IBI Group (design engineer)

Environmental Services: WSP (environmental consultant, EA)

Vehicle Supplier: NovaBus

Legal: McCarthy Tétrault; WeirFoulds (acting for York Region); Borden Ladner Gervais (legal advisor); Osler; Torys (acted for lender)

Other Key Players: Aon Risk Solutions (risk/insurance advisor to authority); BTY Group (ind. certifier); Entro; Golder (ground engineering services); Hanscomb; Revay and Associates; Morrison Hershfield (prime design consultants); KPMG (advisory services); LeighFisher (ind. quality certifier); Hanscomb (owners' engineer's cost consultant); INTECH (insurance advisor); CIMA+ (road safety audits); GHD (sanitary design); EY (financial advisory services); ARUP (technical advisory services); Comtech (program mgmt. consulting); Wood PLC; Rider Levett Bucknall

Supplier: Canam Group (steel joists); Van Hool; DECAST Ltd.

Funding: Public

- **Federal:** $85 million
- **Provincial** Capital allotment to Metrolinx, the regional transportation authority: $1.33 billion
- **Municipal:** $85 million

Once completed, vivaNext Rapidways will be more than 35 kilometres of dedicated bus lanes in the centre of the road that will allow rapid transit buses to provide more reliable and frequent service to York residents. This new bus rapid transit service will be available on two significant corridors: east-west along Highway 7 and north-south along Yonge Street with another small east-west route along Davis Drive in Newmarket. As of the fall of 2018, the Vaughan, Woodbridge, and Newmarket sections of the project had reached 60 per cent completion, while the Richmond Hill portion of the project was approximately one-third complete. The previous three sections are scheduled for completion by the end of 2019, while the Richmond Hill portion is expected to be finished by the end of 2020.

40 Fort McMurray West Transmission Project

$1.43 billion

2018 Rank: 35

Location: Edmonton to Fort McMurray, Alberta

Owner: Alberta PowerLine

DBFOM Team: Alberta PowerLine—Quanta Services (subsidiary Valard Construction to provide EPC services), ATCO Electric (route planning, operations, and maintenance)

Legal: Bennett Jones (acted for successful proponent); Norton Rose Fulbright; Torys (proponent lenders); Fasken Martineau DuMoulin (counsel to Quanta Services and Valard Construction)

Other Key Players: Aon Risk Solutions (risk/insurance advisor to authority); INTECH Risk Management (insurance advisor)

Funding: Private

- **Private:** $1.43 billion

This project will consist of approximately 500 kilometres of transmission line and associated facilities in order to support increasing growth in northeastern Alberta. It will include a 500-kilovolt (kV) AC single-circuit transmission line, approximately 100 kilometres in length, running from a new substation in the Thickwood Hills area to the existing Livock 939S substation, and a 500 kV AC single-circuit transmission line, approximately 400 kilometres in length, running from Livock 939S substation to the approved Sunnybrook 510S substation. The proposed route, substations, and design of the transmission line are subject to approval by the Alberta Utilities Commission (AUC). Approval for the project was granted by the AUC in February 2017. The project is set to be in service in 2019.

A Decade of Top100

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

41 Hurontario LRT

$1.4 billion

2018 Rank: 36

Location: Mississauga and Brampton, Ontario

Owner: Metrolinx

Project Manager: Infrastructure Ontario

Construction Manager: SNC-Lavalin (preliminary design/EA phases)

Engineer: SNC-Lavalin (project lead); Steer Davies Gleave (preliminary engineering); AECOM (technical advisory services)

Legal: Borden Ladner Gervais (legal advisor); Torys (acted for lender)

Other Key Players: DIALOG (urban design); Dufferin Construction; Golder (preliminary geotechnical services); Hanscomb (preliminary design engineer's cost consultant); Hatch; LEA Group (ITS); Aon Risk Solutions (owner advisor and construction insurance broker); AECOM (owner's representative/technical advisor); EY (financial and transaction advisory); Morrison Hershfield (transit O&M advisors); AGAT Laboratories; Comtech (program/project consulting); DECAST; Rider Levett Bucknall

Funding: Public

The Hurontario light rail transit (LRT) project will bring 20 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 22 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. The Request for Proposals was released to three selected proponents in August 2017. The winning bidder was to be selected, and construction was scheduled to begin, in 2018, however that was pushed until early 2019. The anticipated completion of the project is 2022.

42 Calgary Cancer Centre

$1.4 billion

2018 Rank: 37

Location: Calgary, Alberta

Owner: Alberta Health Services

Design-Build Team: PCL; Stantec; DIALOG

Consulting Architect: HKS and Marshall Tittemore Architects (subconsultants);

Legal: Norton Rose Fulbright (for the authority)

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

Funding: Public

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 1,650 stalls of underground parking. The centre will provide much-needed access to cutting-edge treatment and care for residents of Calgary and southern Alberta. In 2018, the five-storey-deep foundation was dug out, and four 300-ft. construction cranes were erected. Concrete pouring of the foundation is now underway. The facility is on schedule to open in 2023.

43 North End Sewage Treatment Plant Biological Nutrient Removal Upgrade

$1.4 billion

2018 Rank: 62

Location: Winnipeg, Manitoba

Owner: City of Winnipeg

Engineer: AECOM (owner's advocate/consultant); KGS Group Ltd.

Legal: Blake, Cassels & Graydon

Other Key Players: Hanscomb (independent/ engineer's design stage cost consultant); Veolia (professional services); P1 Consulting Ltd.

Funding: Public

- **Provincial:** $195 million
- **Municipal:** $1.205 billion

The Province of Manitoba has issued the City of Winnipeg an Environment Act Licence requiring the treatment of nutrients (such as nitrogen and phosphorus) among other requirements at this treatment facility. The implementation of a nutrient-removal process will require a major plant expansion and, given the age of the infrastructure and the complexity of phasing the construction, several new facilities will be constructed. The addition of wet weather treatment processes associated with combined sewer overflow control must be considered in the overall nutrient-removal process design and operational effluent disinfection for wet weather. The preliminary design phase of the plant upgrade is nearing completion.

44 Pattullo Bridge Replacement Project

$1.377 billion

NEW

Location: New Westminster, British Columbia

Owner: Government of B.C.

Engineer: Parsons (owner's engineer)

Other Key Players: Golder

Funding: Public

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. 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 bridge will also have walking and cycling lanes, separated from traffic, on both sides of the bridge. The RFQ for the new bridge was released in the summer of 2018, with a successful proponent to be announced in the spring of 2019. Construction is expected to get underway in 2019, with the bridge opening to traffic in 2023.

45 Romaine Complex Transmission Line

$1.3 billion

2018 Rank: 41

Location: Minganie Region, Quebec

Owner: Hydro-Québec

Engineer: AECOM (engineer, detailed design for transmission towers and foundations)

Contractor: Lockwell, Fabrinet, Prometek (steel); General Cable (cables); TCI-Arnaud and GLR JV (assembly)

Other Key Players: WSP (environmental impact assessment); Thirau; GLR; GHD (geotechnical services); Englobe (field surveillance); EXP

Funding: Public

- **Provincial** Hydro-Québec: $1.3 billion

This project involves the construction of transmission lines needed to connect the 1,550-MW Romaine Complex to the rest of the grid in Quebec. The project includes building more than 500 kilometres of transmission lines, designed for both 315 kV and 735 kV but operated at 315 kV, constructing new switchyards at the generating stations, and modifying and adding equipment in existing facilities. The transmission line is a separate venture from the Romaine Complex project. Construction has been underway since summer 2011 and is expected to be completed by 2020.

Credit: Hydro-Québec

46 Port Hope Area Initiative

$1.28 billion

2018 Rank: 43

Location: Port Hope and Clarington, Ontario

Owner: Atomic Energy Canada Limited, Natural Resources Canada

Project/Construction Manager: Canadian Nuclear Laboratories

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

Engineer: AECOM; MMM-GHD Joint Venture

Environmental Services: Golder (contamination investigation/remediation; Phase 1 ESA; geotechnical)

Financiers/Banks: Natural Resources Canada

Legal: Osler; Torys (acted for the lender)

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+

Funding: Public

- **Federal** Atomic Energy of Canada Limited: $1.28 billion

The Port Hope Area Initiative (PHAI) is a federal environmental cleanup 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. 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, 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 above-ground 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 currently under construction. After the facility is capped and closed, anticipated to be in 2023, 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, located at an existing site on the shoreline of Lake Ontario in southeast Clarington, to a new, engineered above-ground mound at a long-term waste management facility being constructed approximately 700 metres north of the lake.

In August of 2018, a turbidity curtain was installed in the approach channel of Port Hope Harbour to limit the movement of sediment in the harbour. This work is part of the five-year cleanup of contaminated sediment in the harbour, which also includes rehabilitating the aging harbour walls and suction dredging approximately 120,000 cubic metres of sediment.

Substantial completion of the entire Port Hope Area Initiative is expected by 2023.

47 Port Lands Flood Protection and Enabling Infrastructure

$1.25 billion

2018 Rank: 44

Location: Toronto, Ontario

Owner: City of Toronto

Project Manager: Waterfront Toronto; City of Toronto

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

Other Key Players: MVVA (design of parks, flood protection, rover valley); WSP and DTAH (roads and municipal infrastructure); Entuitive with Grimshaw and SBP (bridges); Jacobs (environmental); Toronto Region Conservation Authority; Golder

Funding: Public

- The **Federal**, **Provincial**, and **Municial** governments are each contributing an equal share of $416.6 million to this project.

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 mouth for the Don River, and critical infrastructure for flood resilience to unlock the 325-hectare site for residential and commercial development. In November 2018, Waterfront Toronto held a groundbreaking ceremony to mark the start of construction on the new river valley. The work includes a kilometre-long river valley, a natural spillway, and a new mouth for the Don River.

48 Alberta Carbon Trunk Line

$1.233 billion

2018 Rank: 46

Location: Fort Saskatchewan to Clive, Alberta

Owner: Enhance Energy Inc.; Wolf Carbon Solutions

Project/Construction Manager: SAW Engineering (EPC management)

Engineer: Caber Engineering; SAW Engineering; BETA Tech Engineering

Other Key Players: WSP (geomatics services); North West Redwater Partnership's Sturgeon Refinery; Agrium Inc.; LeighFisher (lenders technical advisor); Land Solutions LP; BOSS Environmental; Worley; Scott Land

Supplier: Siemens; MAN Diesel and Turbo; Comco Pipe and Supply; KTI Ltd; Exchanger Industries Ltd.; Startech Refrigeration; Spectrum Process Systems

Funding: Public/Private

- **Federal:** $63.2 million
- **Provincial** CCS Fund: $223 million
- **Private:** $641.8 million (Enhance Energy), $305 million (Wolf Carbon Solutions)

This 240-kilometre pipeline will collect CO_2 from industrial emitters in and around Alberta's industrial heartland and transport it to aging reservoirs throughout central and southern Alberta for secure storage in enhanced oil recovery projects. At full capacity, the line will provide access to reservoirs capable of producing an additional one billion barrels of high-quality light crude oil. These reservoirs will safely and securely store 14.6 million tonnes of CO_2 per year as the oil is produced. It will be the largest carbon capture and storage project in the world, storing six times more carbon dioxide than the Weyburn project in Saskatchewan. In August of 2018, Enhance Energy announced a partnership with Wolf Carbon Solutions Inc. Under this agreement, Wolf will construct, own, and operate the CO_2 capture and pipeline transportation assets. Enhance will continue to be the owner and operator of the CO_2 utilization and sequestration portion of the ACTL project through its EOR operations.

49 Energy Services Acquisition Program's Energy Service Modernization

$1.2 billion

NEW

Location: Ottawa, Ontario and Gatineau, Quebec

Owner: Government of Canada

Legal: Norton Rose Fulbright (advisor to project owner)

Funding: Public

- **Federal:** $1.2 billion

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 CHCPs service 79 total buildings. In March of 2018, Innovate Energy and Rideau Energy Partners were named as the two proponents that will bid on the project. Once their proposals are submitted, Public Services and Procurement Canada will consider elements that extend beyond cost. For instance, the firms will have the opportunity to demonstrate that their technologies can reduce greenhouse gas emissions beyond targets set by Canada. They will also have to provide innovative design features for the Cliff Heating and Cooling Plant, which is located along the Ottawa River and bordered by parliamentary buildings. The winning proponent will be announced in early 2019. The procurement process will result in a public-private partnership, and a contract is expected to be finalized with a private sector partner in the spring of 2019.

50 West Park Healthcare Centre

$1.2 billion

NEW

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)

Other Key Players: EXP (PDC services)

Funding: P3

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;
- Three-piece private washroom for each patient, even in double occupancy rooms;
- Significant increase in outpatient care space to accommodate current and new services such as geriatric clinics and day hospital, and satellite hemodialysis;
- Demolition of three existing hospital buildings—Main, Ruddy, and Gage—as well as the existing maintenance buildings;
- New campus entrance with new public and private roads within the campus; and
- Increased green space, landscaping for outdoor therapy, therapeutic gardens, walking paths and courtyards, plus terraces on every floor.

The winning bidder was selected in June of 2018, and construction began shortly thereafter. The project is to be completed in early 2023.

51 New TTC Light Rail Vehicles

$1.187 billion

2018 Rank: 48

Location: Toronto, Ontario

Owner: TTC

Engineer: Parsons

Vehicle Supplier: Bombardier

Other Key Players: KPMG (advisor for TTC Capital Program Delivery Review); WSP (consulting on the manufacture and procurement, commissioning, hazard and safety control phases of new vehicle projects); Comtech (project consultant services)

Funding: Public

- **Provincial:** $416 million
- **Municipal** TTC: $771 million

The provincial government has allocated up to $416 million, or one-third funding of eligible costs related to the purchase of 204 light rail vehicles, to replace the current streetcar fleet. Delivery of the vehicles has seen significant delays throughout the order's tenure due, in large part, to issues with the supply chain. In July of 2018, it was announced that the first 67 of the 89 cars delivered would have to be sent to the company for repairs, citing the fact that they could fail prematurely. The program is active and is slated to run from 2009 to 2019, when the last LRV is delivered. However, an updated timeline for the delivery of all 204 functioning vehicles has not yet been established.

52 Highway 407 East Extension – Phase 2

$1.158 billion

2018 Rank: 49

Location: Oshawa to Clarington, Ontario

Owner: Ontario Ministry of Transportation

Project Manager: Infrastructure Ontario

DBFM Team: DBFM Team: Blackbird Infrastructure Group—Holcim (Canada) and Cintra Infraestructuras (developer); Dufferin Construction and Ferrovial Agroman Canada (constructors); Urban Systems, AIA Engineers, and Louis Berger Group (designers); Holcim and Cintra Infraestructuras (maintenance)

Engineer: EXP (geotechnical design for structures and pavements); Parsons

Legal: Cassels Brock & Blackwell (legal counsel to the Authority); Osler (legal counsel to the SPV); McMillan (legal counsel to the finance parties; Torys (acted for lender)

Other Key Players: Aon Risk Solutions (risk/insurance advisor to authority); Jacobs (technical advisors for procurement and implementation); EY (advising gov't.); Infrastructure Ontario (procurement manager and project development); LeighFisher (lenders technical advisor); INTECH Risk Management (insurance advisor); Golder (materials testing and inspection); Englobe; A.W. Hooker Associates (independent certification); GHD (quality assurance services); WSP (archaeology); AGAT Laboratories; Rider Levett Bucknall

Suppliers: Canam Group; DECAST Ltd.

Funding: P3/AFP

Credit: Ontario Ministry of Transportation

Financing

The aggregate AFP delivery costs are $1.158 billion, with base capital costs of $1.052 billion.

Phase 2 will extend Highway 407 East approximately 22 kilometres from Harmony Road to Highway 35/115 in Clarington. The work also includes the addition of the 10-kilometre East Durham Link (EDL or Highway 418), which connects Highway 407 with Highway 401. There are eight interchanges as well, three of which are freeway-to-freeway. Phase 2A of the project, running from Harmony Road to EDL, was completed in January 2018. Phase 2B of the project, from EDL to Highway 35/115 and including the EDL, is underway and scheduled for completion in 2020.

53 East Side Transportation Initiative

$1.125 billion

2018 Rank: 50

Location: Eastern Manitoba

Owner: Province of Manitoba

Engineer: SNC-Lavalin; AECOM; Dillon Consulting; Associated Engineering (design engineer)

Consulting Architect: Dillon Consulting (compliance architect); KGS Group (compliance architect)

Environmental Services: Tetra Tech

Funding: Public

This all-season road on the east side of Lake Winnipeg is a multi-year, multi-billion-dollar project. In 2000, the communities on the east side of Lake Winnipeg delivered a report with recommendations on where government should focus their long-range planning activities, including increased economic development opportunities and improvements to the transportation network. Construction has been guided through the East Side Transportation Initiative, launched following the East Side Large Area Transportation Network Study undertaken by SNC-Lavalin/AECOM. It is a strategic initiative to provide improved, safe, and more reliable transportation service to remote and isolated communities on the east side of Lake Winnipeg. The final report of the Large Area Transportation Network Study was completed in June 2011 and recommended an all-season road network for the region that is estimated at 1,028 kilometres in length costing $3 billion.

The all-weather road linking Berens River and Bloodvein First Nation to the provincial highway network was completed in December of 2017. Among the work in the planning stages is the all-season road linking Manto Sipi Cree Nation, Bunibonibee Cree Nation and God's Lake First Nation.

54 Henvey Inlet Wind Project

$1 billion

2018 Rank: 52

Location: Between Sudbury and Parry Sound, Ontario

Owner: Pattern Development and Nigig Power (wholly owned by Henvey Inlet First Nation)

Environmental Services: AECOM (environmental assessment reports)

Legal: Torys (project owner legal advisor); Osler

Other Key Players: Englobe (geotechnical investigation, quality control)

Funding: Private

The 300-MW Henvey Inlet wind project in northern Ontario is in the final planning stages. The feed-in tariff scheme is a 50-50 joint venture between Pattern Development and Nigig Power, which is wholly owned by Henvey Inlet First Nation. It will be constructed on reserve lands in Parry Sound County, near Georgian Bay. The project does not require provincial permits as the First Nation has legal authority to grant a lease and environmental approval. Construction work began in 2017, with an estimated timeline of 18-24 months. Construction was temporarily halted during the summer of 2018 due to the Parry Sound 33 forest fire, however construction of the project is still slated for completion in 2019.

Building Energy Capacity

New: **4,259 MW** Rufurbished: **7,619 MW** — Hydroelectric

Rufurbished: **9,812 MW** — Nuclear

New: **350 MW** — Natural Gas

New: **300 MW** — Wind

Work on new and refurbished energy projects in Canada represents **22,340 MW** of power

55 Deep Geological Repository

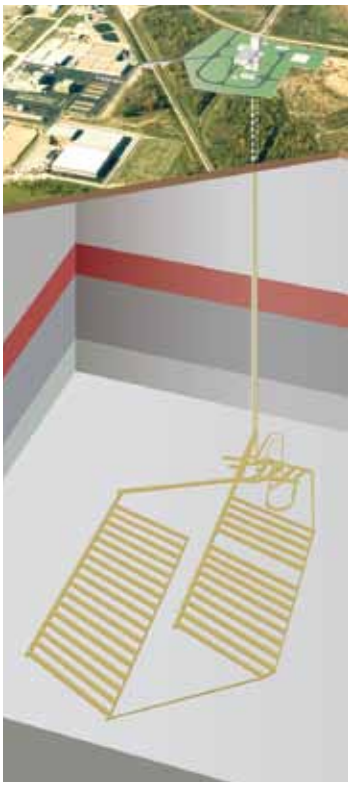
$1 billion

2018 Rank: 53
Location: Kincardine, Ontario
Owner: Ontario Power Generation
Project/Construction Manager: Nuclear Waste Management Organization
Engineer: Hatch
Other Key Players: AECOM (env. consulting); Geofirma Engineering (geoscientific characterization); G.L. Tiley & Associates; Golder (env. impact statement); Tetra Tech; WorleyParsons; WSP (technical review/support); Morrison Hershfield (fire protection analysis); AGAT Laboratories
Funding: Public

OPG is building this 680-metre-deep underground storage facility to house 200,000 cubic metres of low and intermediate level radioactive waste. Low-level waste consists of material that may be contaminated through the normal course of operations at a nuclear facility such as paper towels, mops, and used tools. While low-level waste does not require specialized shielding for workers, the intermediate waste will require special handling and can consist of items such as irradiated core components, ion exchange resins, and various filters. Used fuel, considered high-level waste, is not to be stored in the Deep Geologic Repository (DGR).

The repository will safely isolate and contain the waste undergroud ensuring protection of the water and the environment for many thousands of years. It will be buried 680 metres—deeper than the CN Tower is tall—in stable rock formations that are more than 450 million years old. In May 2015, an independent federal joint review panel recommended to the Federal Minister of the Environment that OPG be granted a licence to construct the DGR.

In August of 2017, OPG was asked for further information about the project from Minister of Environment and Climate Change Catherine McKenna, including an update on impacts to the Saugeen Ojibway Nation. Negotiations with both parties to allow the project to move forward are still ongoing.


Credit: Ontario Power Generation

56 Hamilton LRT

$1 billion

2018 Rank: 55
Location: Hamilton, Ontario
Owner: Metrolinx
Project Manager: Infrastructure Ontario
Engineer: Morrison Hershfield (design engineer)
Legal: Torys (acted for lender); Blake, Cassels & Graydon (advising Infrastructure Ontario and Metrolinx)
Other Key Players: AECOM (technical advisory services); Morrison Hershfield (feasibility study); SNC-Lavalin (preliminary design); Aon Risk Solutions; AGAT Laboratories; Comtech (program/project consulting); Rider Levett Bucknall
Funding: Public


Credit: Metrolinx

The original plan for the Hamilton LRT project included approximately 11 kilometres of new light rail that will connect McMaster University through downtown Hamilton to Queenston Circle. The project also includes a high-order pedestrian connection to the Hamilton GO Centre Station, and a maintenance and storage facility. In April 2018, Hamilton City Council voted in favour of the LRT line, but decided to investigate the 14-kilometre option, versus the original 11-kilometre option, extending the line eastward from Queenston Circle to Eastgate Square. In April of 2018, three teams were announced as the successful proponents to participate in the RFP. The winner will be announced in early 2019, with construction to begin later that year.

57 Yellowhead Trail Freeway Conversion Project

$1 billion

NEW

Location: Edmonton, Alberta
Owner: City of Edmonton
Engineer: Morrison Hershfield (owner's engineer)
Funding: Public

Financing

The Government of Canada, along with the Government of Alberta, have each contributed $241.6 million to the project. The City of Edmonton will cover the remaining costs of the project.

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 in the first two areas of the freeway project will begin in 2019. The entire project is projected to be completed sometime in 2026.

58 Toronto Courthouse Project

$956.4 million

NEW

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); Morrison Hershfield (sustainability services)

Architect: Kleinfeldt Mychajlowycz Architects Inc.; Montgomery Sisam Architects Inc.

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

The new Toronto Courthouse will amalgamate several Toronto courts located throughout the city.

The new Toronto courthouse will include:

- Barrier-free access, to allow visitors and occupants to travel throughout the building with ease, regardless of ability;
- Video conferencing to allow witnesses to appear from remote locations and in-custody individuals to appear from detention facilities;
- Closed-circuit television to enable children and other vulnerable witnesses to appear before the court from a private room;
- Courtroom video/audio systems to allow counsel to display video evidence recorded in various formats and for the simultaneous viewing of evidence; and
- A single point of entry with magnetometers, baggage scanners, continuous video surveillance, and separate corridors to ensure the security of judges, members of the public, and the accused.

Construction began shortly after the project reached financial close in February 2018. Substantial completion is expected in 2022.

59 Giant Mine Remediation Project

$903.5 million

2018 Rank: 57

Location: Yellowknife, Northwest Territories

Owner: The Government of the Northwest Territories and Aboriginal Affairs and Northern Development Canada, with support from Public Works and Government Services Canada

Project/Construction Manager: Aboriginal Affairs and Northern Development Canada and the Government of the Northwest Territories; AECOM (construction management)

Engineer: AECOM (environmental studies, preliminary and detail design, construction management); Parsons

Other Key Players: Parsons (project planning/permitting, decontamination, hazardous waste abatement, deconstruction, construction management); Golder (multi-disciplinary consulting services, general and civil design); Hatch (design); SRK Consulting, Arcadis Canada Inc. (lead technical advisors); Colliers Project Leaders

Funding: Public

- **Federal:** $903.5 million

Between 1948 and 2004, the Giant Mine was a major economic driver for Yellowknife and the Northwest Territories. Mining operations at the site, which grew over the years to encompass more than 870 hectares, including a number of ponds and small lakes, were halted in July 2004. Since 2005, Aboriginal Affairs and Northern Development Canada (AANDC) and the Government of Northwest Territories (GNWT) have co-managed the site, with the Det'on Cho Nuna Joint Venture providing on-site care and maintenance. However, when the mine closed, 237,000 tonnes of arsenic trioxide were left behind in underground chambers. The remediation project proposes to leave behind a site suitable for future community use as the community sees fit. In August 2014, the decision was made to move forward in implementing the measures outlined in the environmental assessment. The project's goal is to ultimately protect public health and safety and the environment through long-term containment and management of the site's waste, water treatment, and surface cleanup at the site. In February of 2018, the main construction manager for the project was selected. Term 1 of the work will centre around responsibility for site care and maintenance and emerging risks on site, as well as supporting planning efforts for the full remediation in Term 2. This work will start immediately and will be undertaken until March 31, 2020. In Term 2, set to begin in 2020, the construction manager will oversee the implementation of the overall remediation plan and associated activities.

60 Highway 1 Upgrades—Kamloops to Alberta

$872.7 million

2018 Rank: 58

Location: Kamloops, British Columbia to Alberta border

Owner: Government of B.C.

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

Other Key Players: Golder (geotech, environmental services); Englobe (pavement engineering services, QA, QV); WSP (construction supervision services); Wood PLC

Funding: Public

The Government of B.C. has embarked on a 10-year, $650-million project to expand the Trans-Canada Highway (Highway 1) between the City of Kamloops and the Alberta border. The focus of the expansion is to four-lane the entire section of roadway, which includes 339 kilometres under the jurisdiction of the B.C. Ministry of Transportation and Infrastructure, as well as 101 kilometres under the jurisdiction of Parks Canada. Construction is underway on a 2.5-kilometre stretch 20 kilometres west of Golden. One section of the Hoffman's Bluff to Jade Mountain section will begin construction in 2019, with the remaining sections currently in the design phase.

61 Canadian Forces Base Trenton Expansion

$860 million

2018 Rank: 59

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

Design Engineer: Wood PLC; SNC-Lavalin; Jain & Associates; J.L. Richards & Associates; Peak; Stantec

Consulting Architect: Architecture 49 (previously Smith Carter Architects); 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)

Funding: Public

- **Federal:** $860 million

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 hangars 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 2016, Hangar 2 obtained LEED Gold certification. The project continues and is expected to be finalized by 2022. At CFB Trenton, substantial upgrades to the natural gas service, expansion of the electrical service, and construction of the Land Advanced Warfare Centre, hazardous materials transfer facility, and fire hall is all complete. Work on new hangars and runways is ongoing.

62 Union Station Revitalization Project

$823.7 million

2018 Rank: 61

Location: Toronto, Ontario

Owner: City of Toronto

Project/Construction Manager: Carillion (Stage 1) and Bondfield Construction (Stage 2/3)

Program Manager: WSP (Stage 2/3)

Engineer: EXP (train shed roof design and construction admin); NORR Limited Architects & Engineers (structural, mechanical and electrical)

Contractor: Clifford Restoration (building envelope restoration)

Architect: NORR Limited Architects & Engineers (prime design consultant); DIALOG (executive architect of retail features)

Management Consultants: EY

Legal: WeirFoulds (acting for architects); Osler

Other Key Players: Arup (4D modelling, pedestrian flow, construction coordination analyses); A.W. Hooker Associates (cost management); Entro (wayfinding and signage); Engineering Harmonics (AV consultant); FGMDA (heritage consultant); Golder (construction mat. engineering/testing); Hanscomb (study and design teams' cost consultant); WSP (geotechnical consultant); Aecon (train shed platform); Aon (risk advisor/broker for preferred proponent); Morrison Hershfield (conceptual study); Comtech (multidisciplinary consulting services)

Supplier: Canam Group (steel deck); Dufferin Concrete

Funding: Public

The revitalization project includes restoration of many of the station's heritage elements, creation of 160,000 sq. ft. of retail space with the focus of bringing the best of Toronto's independent retailers and restaurants to the station, and expansion of the GO concourses to accommodate the expected doubling of passengers by 2030. In April 2015, the new spacious 62,000-sq.-ft. York Concourse opened to provide almost twice the space of the existing Bay Concourse to help get customers to where they are going faster and easier. In August 2015, the Bay Concourse was closed to undergo renovation. Substantial completion is expected in early 2019.

63 Canadian Forces Base Esquimalt A and B Jetty Recapitalization Project

$781 million

2018 Rank: 91

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 (multiple services)

Other Key Players: Wood PLC (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

Funding: Public

- **Federal** Department of National Defence: $781 million

The aim of the jetty project is to demolish the existing A and B jetties at CFB Esquimalt's dockyard and construct a new steel-and-concrete-pile A and B jetty facility in the same location. Due to the degraded functional and technical condition of the existing 70-plus-year-old structures, the recapitalization of these facilities has long been an infrastructure priority for the Royal Canadian Navy and the Department of National Defence. This project will provide sufficient operational berthing space for four Halifax-class frigate, two Arctic/offshore patrol ships, one Queenston-class joint support ship, and one Victoria-class submarine. Significant portions of the dockyard's service-support infrastructure will be recapitalized: both existing jetty cranes will be replaced, and all utility infrastructure to the site will be renewed. The project will also include rebuilding roads and sidewalks as well as the expansion and improvement of the jetty-apron area. Phase 1 of the A/B Jetty project was completed in 2014. A contract for works involving the replacement of the main substation was awarded in early 2018, and final elements of that work were continuing into 2019. The project is expected to be completed by 2024.

64 Capital Region District Wastewater Treatment Plant

$765 million

2018 Rank: 63

Location: Victoria, British Columbia

Owner: Capital Region District

DBF Team: Harbour Resource Partners (McLoughlin Point Wastewater Treatment Plant)—AECOM Canada; Graham; SUEZ; CEI; Gracorp; Michelss Canada

DBFOM Team: Hartland Resource Management Group (Residuals Treatment Facility)

Contractor: Kenaidan Contracting Ltd. (Clover Point Pump Station)

Management Consultants: EY

Legal: Norton Rose Fulbright (advisor to CRD)

Other Key Players: KPMG (commercial advisor); Operis (financial advisor for RTF team); Aon Risk Solutions; Associated Engineering; Kerr Wood Leidal; Stantec; Parsons (Residual Solids Pipeline Phase – Designer); GHD (odour control & HVAC)

Funding: P3

Credit: Capital Region District

The Capital Regional District's Wastewater Treatment Project will provide tertiary treatment for wastewater from the core area municipalities of Victoria, Esquimalt, Saanich, Oak Bay, View Royal, Langford, and Colwood, as well as for theEsquimalt and Songhees Nations. The project consists of three main components: the McLoughlin Point Wastewater Treatment Plant which will provide tertiary treatment to the core area's wastewater; the Residuals Treatment Facility which will turn the residual solids into Class A biosolids; and the conveyance system which is the pumps and pipes that will carry wastewater from across the core area to the treatment plant and residual solids to the Residuals Treatment Facility. Construction of the McLoughlin Point Wastewater Treatment Plant got underway in April 2017. In 2018, the Residuals Treatment Facility began construction, along with the major parts of the conveyance system. The remaining aspects of the conveyance system will begin construction in 2019. All of the project components are scheduled for completion by the end of 2020.

65 Lakeshore East GO Expansion

$735 million

NEW

Location: Toronto to Bowmanville, Ontario

Owner: Metrolinx

Engineer: Parsons (owner's engineer)

Other Key Players: 4-Transit JV (technical advisory services): Hatch, Parsons, WSP; Golder; Infrastructure Ontario (procurement lead); Rider Levett Bucknall; Comtech (project mgmt. services)

Funding: Public

The Lakeshore East GO Expansion project will provide two-way, all-day service on the corridor, which currently stretches from Union Station east to Oshawa. The expansion project will push the line further east, with two new stations to be built in Oshawa, as well as one in Courtice and one in Bowmanville. The project also includes station enhancements throughout the current network. Completion of the Lakeshore East GO Expansion is currently scheduled for 2025.

66 Rehabilitation of Robert-Bourassa Generating Units

$732 million

2018 Rank: 66
Location: Baie-James, Quebec
Owner: Hydro-Quebec
Contractor: GE; TRANSAR
Other Key Players: EXP; McElhanney
Funding: Public

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 Quebec. This project includes the rehabilitation of eight of the 16 generating units of the Robert-Bourassa generating station, as well as the speed governors, static excitation systems and cooling systems in all 16 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 Quebec's energy future. Project completion is targeted for 2022.

67 Union Station Infrastructure Renewal Program

$700 million

2018 Rank: 67
Location: Toronto, Ontario
Owner: Metrolinx
Project/Construction Manager: Joint Venture—Hatch (lead), Parsons, IBI Group
Engineer: Morrison Hershfield (design engineer)
Other Key Players: Entro (signage and wayfinding consultant); Morrison Hershfield (track/signals eng. for conceptual work); WSP (geotechnical consultant, design services); Aon Risk Solutions (risk advisor/broker for member of preferred proponent); Hatch (signals specialist); WSP (materials inspection and testing); Golder; Rider Levett Bucknall
Funding: Public

The Union Station rail corridor is the 6.4-kilometre hub of Toronto's transit network and consists of a complex arrangement of approach tracks, passenger platforms, and four interlockings at Cherry, Scott, John, and Bathurst streets. The corridor supports GO Transit commuter trains, Canadian Pacific, Canadian National, VIA, and ON Rail operations. It has 14 station tracks with platform access and more than 180 signals, 250 switch machines, 40 kilometres of circuited track, and all associated infrastructure, dating back to the late 1920s. This will be replaced with state-of-the-art computer-based interlockings and LED signalling technology. The scope of work has included track additions and upgrading, replacement of all special trackwork in the multi-track rail corridor extending almost 6.5 kilometres east and west of the station, and replacement of the 90-year old signalling system with new state-of-the-art signals, communications, power supply, CCTV, and SCADA systems. The program is expected to wrap up in 2019.

68 North Shore Wastewater Treatment Plant

$700 million

2018 Rank: 68
Location: North Vancouver, British Columbia
Owner: Metro Vancouver
DB(F) Team: ADAPT Consortium—Acciona Infrastructure; DIALOG; Wood PLC; TetraTech
Engineer: AECOM (owner's engineer)
Consulting Architect: Miller Hull; HDR/CEI
Legal: Norton Rose Fulbright (counsel for Metro Vancouver); Osler (DBF Counsel); Torys (acted for lender)
Other Key Players: Space2Place (public consultation, research and analysis, concept development); BTY Group (cost consultant); Golder (geotechnical evaluations); Maple Reinders (compatibility advisor); KPMG (business case financial advisor); Pomerleau; Aon Risk Solutions; WSP (procurement)
Funding: P3

Credit: Acciona

This greenfield secondary treatment plant will replace an existing primary treatment plant. New federal and provincial regulations require the upgrade of all primary treatment plants. The existing primary plant removes only 40 to 60 per cent of suspended organic matter in the wastewater which, after primary treatment, is discharged directly into Burrard Inlet—a matter of concern for some environmentalists—and is located on land leased from the Squamish Nation. The new secondary plant will be able to remove over 90 per cent of organic matter and will be located two kilometres east of the existing plant. Increased plant capacity will allow up to 320 million litres per day to be treated under storm conditions. Construction officially began in late August of 2018. The new plant is scheduled to be operational by the end of 2020, and the existing primary plant will be de-constructed once the new plant is in service.

69 CAMH Phase 1C Redevelopment

$685 million

2018 Rank: 70

Location: Toronto, Ontario

Owner: Government of Ontario

Project Manager: Infrastructure Ontario

DBFM Team: Plenary Health—Plenary Group and PCL (developer); PCL (design-build); Stantec (architect); Plenary group (financial advisor); ENGIE Services (facilities manager)

Other Key Players: INTECH Risk Management (insurance advisor); Hascomb (owner's cost consultant); ARUP (risk assessment); Aon Risk Solutions; Colliers Project Leaders

Funding: P3

Credit: Plenary Group

The redevelopment project will see the construction of two modern buildings along Queen Street West in Toronto featuring inpatient and outpatient services for those most in need: people who are acutely ill and those experiencing the most complex forms of mental illness. The project will result in the construction of approximately 655,000 sq. ft. of new build space, which will include:

- 235 in-patient beds;
- Ambulatory programs;
- Relocation of the emergency department to the Queen Street site;
- Research and educational facilities;
- Information and resource facilities; and
- Site improvements, including parks and green space improvements.

By the fall of 2018, slab pours up to Level 5 had been completed, and forming work on Level 6 had begun. The project is on track to reach substantial completion in 2020.

70 Union Station Rail Corridor

$682 million

NEW

Location: Toronto, Ontario

Owner: Metrolinx

Engineer: Pavex, Mike Kelly and Sons; Humber Valley Paving

Other Key Players: Morrison Hershfield; Gannett Fleming; Infrastructure Ontario (procurement lead); Comtech (project mgmt. services)

Funding: Public

Credit: ReNew Canada

Creating an electrified GO service means that significant work will be necessary at the system hub, Union Station in Toronto. Work on the Union Station Rail Corridor (USRC) will include system and track upgrades that will provide the necessary infrastructure for electrified GO trains to enter and exit the station at high frequency throughout the day and night. Completion of the upgrades to the USRC is anticipated by the end of 2025.

71 Chinook Power Station

$680 million

2018 Rank: 72

Location: Swift Current, Saskatchewan

Owner: Government of Saskatchewan

Project Manager: SaskPower

Contractor: Burns and McDonnell (EPC services)

Other Key Players: WSP (surveying)

Supplier: Siemens (one SGT6-5000F gas turbine, a SST-900 steam turbine, a SGen6-1000A generator, and one SGen6-100A generator)

Funding: Private

The Chinook Power Station is SaskPower's newest project for providing a stronger energy supply for the people of Saskatchewan. The 350-MW natural gas-fired power facility will be located on the outskirts of Swift Current in the province's southwest. The EPC contract was awarded in September of 2016. In August 2018, SaskPower announced that power had been successfully brought to the station, allowing for functional tests to proceed. Also, approximately five kilometres of power lines, linking the station to the grid, have been constructed. As of the fall of 2018, the project remained on budget and on time, set to come online in October 2019.

72 Grande Prairie Regional Hospital

$647.5 million

2018 Rank: 74

Location: Grande Prairie, Alberta

Owner: Alberta Health Services

Project/Construction Manager: Clark Builders

Engineer: Stantec; WSP (engineer, mechanical, and electrical design)

Consulting Architect: DIALOG (prime consultants); Stantec, HOK (design); Stantec (landscape architecture); ISL Engineering and Land Services Ltd.

Other Key Players: Aon Risk Solutions (risk advisor/broker for preferred proponent); Colliers Project Leaders; Tetra Tech (materials testing); Graham (construction management services)

Supplier: Canam Group

Funding: Public

- **Provincial** Alberta Health Services: $647.5 million

This new 64,000-square-metre hospital is expected to provide 200 beds, a cancer care centre, and a nursing and medical careers training facility from the Grande Prairie Regional College. It will function as a regional referral centre, providing health services to northwestern Alberta residents. The existing Queen Elizabeth II Hospital will continue as a health care facility to be used to provide ambulatory, community, and other health services. Alberta Health Services will operate on the two sites. In July of 2018, the Government of Alberta filed a notice of default with contractor Graham Construction. The company responded that the notice was "rife with errors and misstatements." A mitigation plan was submitted to the Alberta Government, however they decided that new timelines and costs did not meet the certainty it was expecting. The project was put on hold temporarily while a new contractor was found. In November 2018, Clark Builders was announced as the new contractor. The project remains on target to be completed in 2019.

73 Highway 427 Upgrades

$616 million

2018 Rank: 75

Location: Toronto to Vaughan, Ontario

Owner: Government of Ontario

Project Manager: Infrastructure Ontario

DBFM Team: LINK 427—ACS Infrastructure Canada Inc., Brennan Infrastructures Inc. (Miller Group) (developer); Dragados Canada Inc., Brennan Infrastructures Inc. and Bot Infrastructure Ltd. (construction); MMM Group Ltd. and Thurber Engineering Ltd. (design); ACS Infrastructure Canada Inc. and Brennan Infrastructures Inc. (maintenance)

Engineer: AECOM

Legal: Torys (acted for the lender)

Other Key Players: Golder (preliminary foundation and pavement engineering services); INTECH Risk Management (insurance advisor); Aon Risk Solutions

Supplier: DECAST (precast infrastructure)

Funding: P3

- **Provincial:** $616 million

The expansion of Highway 427 is a 10.4-kilometre addition to one of Toronto's 400-series highways, which currently runs from the Queen Elizabeth Way north to Highway 7 in the city's west end. There are two sections to the project. The first is the widening of the highway from Finch Avenue to Highway 7 (four kilometres), expanding the highway from four and six lanes to eight lanes. This will include the addition of high-occupancy toll (HOT) lanes. The second section is the 6.4-kilometre extension of the highway from Highway 7 to Rutherford Road. This includes the creation of six- and eight-lane highway sections, three interchanges, and median HOT lanes. In 2018, work was done to clear the land north of the current highway, and bridge and culvert installation has begun at multiple points throughout the 10.4-kilometre extension. Completion of the project is expected in 2021.

74 Lake Superior Link (Hydro One) or East–West Tie Transmission Project (Nextbridge)

$600 million

2018 Rank: 77

Location: Municipality of Shuniah (near Thunder Bay) to Wawa, Ontario

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

Environmental Services: Dillon Consulting Limited (environmental assessment)

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

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)

Supplier: Canam Group

Funding: Private

- **Provincial:** $600 million

The East-West Tie Transmission Project is planned to consist of a new, approximately 447-kilometre, double-circuit, 230-kV transmission line, primarily parallelling an existing transmission line corridor. The new East-West Tie will connect 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. In October of 2017, the Ontario Energy Board issued the letter of direction and notice of proceeding for the project. The targeted in-service date in 2020. In early 2018, Hydro One filed for a leave to construct, presenting its own vision (Lake Superior Link) for the project. Acting on concerns that the project cost had risen to $777 million, Hydro One announced that it could build the project for $100 million less, by using an existing corridor through Pukaskwa National Park. A final decision from the OEB on whether or not Hydro One will be granted leave is still pending.

75 Gordon M. Shrum Generating Station Refurbishment

$600 million

2018 Rank: 76

Location: Peace River, British Columbia

Owner: BC Hydro

Contractor: Peter Kiewit Infrastructure

Turbine Supplier: Voith Hydro

Supplier: Andritz Hydro (rotor poles), Siemens (replacement transformers)

Funding: Public

- **Provincial** BC Hydro: $600 million

Credit: BC Hydro

This generating station, located at the W.A.C. Bennett Dam, provides 24 per cent of BC Hydro's hydroelectric power. Currently, there are several capital projects underway at this generating station and the W.A.C. Bennett Dam to replace the station's 50-year-old equipment. The largest in terms of budget is 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. Work is also continuing on the rip-rap and spillway upgrades.

76 Bonnybrook Wastewater Treatment Plant D Expansion

$600 million

2018 Rank: 78

Location: Calgary, Alberta

Owner: City of Calgary

Project/Construction Manager: Graham

Engineer: Stantec (local); Jacobs; AECOM

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

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

Funding: Public

Credit: City of Calgary

One of Calgary's three wastewater treatment plants, Bonnybrook is undergoing an expansion with the plant estimated to be able to service an additional equivalent population of 325,000 people. When construction is completed in 2022, the facility will service a population of 1.366 million people. The Plant D expansion is the largest project of the overall upgrade and includes new primary and secondary clarifiers, new bioreactors with biological nutrient removal system, new treated effluent filtration facility, new Thermal Hydrolysis Process facility, and a new flood berm. The city is also upgrading the existing ultraviolet disinfection system, digesters, and primary sludge thickening systems. A cofferdam has been installed south of the CN Rail river crossing near the project site, which is allowing for the installation of new effluent diffusers. The cofferdam is expected to stay in place until April 2019.

77 Edmonton Clinical Laboratory Hub

$590 million

NEW

Location: Edmonton, Alberta

Owner: Government of Alberta

Construction Manager: PCL Constructors Ltd.

Other Key Players: DIALOG; Morrison Hershfield

Funding: Public

- **Provincial:** $600 million

The Edmonton Clinical Laboratory Hub will amalgamate similar diagnostic services and research under one roof, providing laboratory services for Edmonton and northern Alberta. The Hub will be built on government land, south of the main campus of the University of Alberta. Schematic design of the hub was completed in June of 2018. Construction is scheduled to begin in 2019, with the project operational in the spring of 2022.

Credit: Government of Alberta

78 Corner Brook Acute Care Hospital

$588 million

2018 Rank: 79

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, Constructors, Marco Construction

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

Engineer: WSP (structural engineers, sustainability consultants)

Other Key Players: Hanscomb (functional programmer's cost consultant); WSP (heliport planning)

Funding: Public

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. In June of 2018, Atlantic Healthcare Partnership and Corner Brook Health Partnership were named as the two successful proponents invited to submit a project proposal as part of the RFP process. Premier Dwight Ball stated at that time that he expected the successful proponent to be named in the spring of 2019, and construction to begin shortly after that announcement.

79 Southwest Rapid Transitway (Stage 2) and Pembina Highway Underpass Project

$587.3 million

2018 Rank: 80

Location: Winnipeg, Manitoba

Owner: City of Winnipeg

P3 Team: Plenary Roads Winnipeg (Plenary Group); PCL Construction (construction)

Engineer: Dillon Consulting (owner's advocate); Landmark Planning & Design (public consultation); McGowan Russell Group (active transportation, station design, station areas, landscaping)

Legal: Blake, Cassels & Graydon (counsel to owners)

Other Key Players: Deloitte (financial); Hanscomb (engineer's cost consultant); LeighFisher (lenders technical advisor); Plenary Group (lead developer and equity provider, OM&R provider); Aon Risk Solutions (risk advisor/broker for preferred proponent); Hatch (rail design); Morrison Hershfield (transitway and road works design); TetraTech (structural design); Wood PLC

Funding: Public

This project—previously listed as the Winnipeg Capital Integration Project—will be the City of Winnipeg's largest infrastructure project to date. It involves significant components in the southwest quadrant of the city, including completion of Stage 2 of the Southwest Transitway, the addition of active transportation infrastructure, and the renewal and expansion of the Pembina Underpass. Stage 2 will extend the transitway from the Pembina Highway and Jubilee Avenue south to the University of Manitoba. Completion of the project will represent a significant step forward in building the transportation network outlined in the city's transportation master plan and will help promote the increased densification of Winnipeg by facilitating the future development of several large-scale, infill, transit-oriented developments. Construction has started; with completion expected in late 2019. Operator training and facility commissioning will be carried out, with full operation expected to commence in April 2020.

80 Réno-Systèmes Program Phase IV

$582.5 million

2018 Rank: 81

Location: Montreal, Quebec

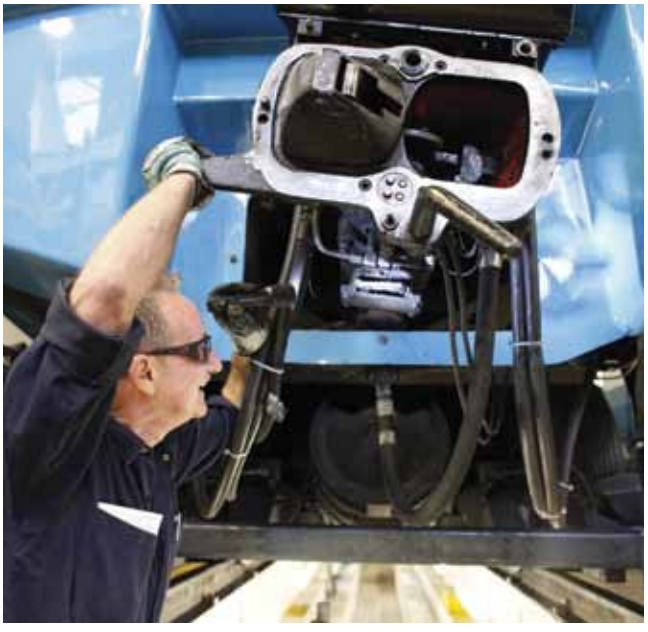
Owner: STM

Engineer: SNC-Lavalin

Other: Englobe (quality management services)

Funding: Public

In the fall of 2014, the board of directors of Société de transport de Montréal (STM) announced that it would invest $582.5 million into replacement of metro stationary equipment in Phase 4 of its Réno-Systèmes program. The program, still in the design phase according to the 2016-2026 Quebec Infrastructure Plan, calls for the systematic replacement of end-of-life assets in the following categories: energy, accessibility, ventilation, motorized installations, telecommunications and operating process controls, track equipment, and train control. STM's current budget calls for a $64.6-million investment in 2017, with over $100 million to be spent on the project each year from 2018 to 2020.



Credit: STM

81 Stouffville Corridor GO Expansion

$581 million

NEW

Location: Stouffville, Ontario

Owner: Metrolinx

Engineer: AECOM

Other Key Players: 4-Transit JV (technical advisory services): Hatch, Parsons, WSP; Golder; Morrison Hershfield; Gannett Fleming; Infrastructure Ontario (procurement lead); Rider Levett Bucknall; Comtech (project mgmt. services)

Funding: Public

The expansion of the Stouffville corridor is expected to increase service along the line by up to 400 per cent. The upgrades will provide all-day, two-way service throughout the corridor, which stretches north from Union Station to Lincolnville GO. The current plan for the expansion also includes the addition of four new stations: Lawrence-Kennedy, Finch-Kennedy, East Harbour and Gerrard-Carlaw. Work on the Stouffville expansion is expected to be completed in 2025.

82 Bowmanville Extension Project

$550 million

2018 Rank: 82

Location: Bowmanville, Ontario

Owner: Metrolinx

Other Key Players: Wood PLC and Stantec (technical advisory services)

Funding: Public

Announced in June of 2016, the Bowmanville Extension project will see the Lakeshore East train line extened nearly 20 kilometres from Oshawa to Bowmanville. The project includes the creation of four new stations: two in Oshawa, one in Courtice, and one in Bowmanville. When service begins, four rush-hour trains will leave from Bowmanville in the morning, and return in the afternoon. 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.

83 Annacis Island Wastewater Treatment Plant Expansion

$550 million

2018 Rank: 83

Location: Delta, British Columbia

Owner: Metro Vancouver

Construction Manager: Graham/Aecon Joint Venture (Stage 5 expansion); Hatch (outfall project)

Contractor: North American Construction; Kenaidan Contracting (computer control system and laboratory building)

Engineer: Brown and Caldwell, Stantec, EIC Solutions, Klohn Crippen Berger (Stage 5 Expansion); CDM Smith, Golder Associates (outfall); Wood Group, Black & Veatch (Cogeneration Backup Power)

Legal: Norton Rose Fulbright (for Metro Vancouver)

Other Key Players: EXP (vibration monitoring); JJM Construction and Geopac Inc. (prepare the ground and relocate utilities); Golder (outfall design team); WSP (materials engineering and testing); Hatch (tunnel design review and outfall construction management); Colliers Project Leaders; Wood PLC

Funding: Public

- **Municipal:** $550 million

When this Stage 5 project by Metro Vancouver is complete, the Annacis Island facility will serve 1.5 million people in 14 Metro Vancouver municipalities. Today, it serves 1.25 million people. The previous expansion, Stage 4, was done in the late 1990s. The plant serves much of the Tri-Cities, Burnaby, Maple Ridge, Delta, Surrey, Pitt Meadows, Langley, and White Rock. Four proponents have been shortlisted for the outfall project, the next phase of the Annacis expansion. The winning bidder is scheduled to be named in early 2019, with construction beginning shortly thereafter.

84 Lake St. Martin Channel Project

$540 million

NEW

Location: Interlake, Manitoba

Owner: Government of Manitoba

Contractor: 513 Construction Ltd./Glen Hartman Construction Ltd. (all-weather road construction); Interlake Regional Tribal Council/Sigfusson Northern Ltd. (all-weather road construction)

Engineer: Hatch; KGS Group

Environmental Services: North/South Consultants Inc.; M. Forster Enterprises; Stantec; E. Hicks & Associates Ltd.; Szwaluk Environmental Consulting Ltd.; Magellanicum Ecological Services

Funding: Public

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

Financing

From the Government of Manitoba: Cost-share with Infrastructure Canada (INFC) as part of the Disaster Mitigation Adaption Fund (DMAF). Agreement-in-principle signed with INFC to cost share up to $247.5M of the total project cost.

In 2011, southern Manitoba experienced widespread flooding and Lake Manitoba experienced excessively high inflows through the Waterhen River, Whitemud River, and the Portage Diversion. This flood protection project is intended to improve lake level regulation and consequently reduce the likelihood of flooding along Lakes Manitoba and St. Martin. The $540-million flood protection project consists of two 23-kilometre long outlet channels with associated control structures and bridge crossings as well as an 80-kilometre all-weather access road and a 24kV transmission line to the Lake St. Martin outlet channel control structure. The Lake Manitoba outlet channel will connect Watchorn Bay on Lake Manitoba to Birch Bay on Lake St. Martin and the Lake St. Martin outlet channel will drain Lake St. Martin from a point in the southeast to Willow Point in Lake Winnipeg. Two sections of the all-weather access road are currently under construction, with an anticipated completion in 2019. Outlet Channel construction is scheduled to commence in 2020. Manitoba recognizes its duty to consult with Indigenous peoples in a meaningful way. The engagement and consultation process is currently underway, with 31 Indigenous communities identified as having the potential to be affected by the project.

85 Metrolinx Light-Rail Vehicles

$528 million

2018 Rank: 84
Location: Toronto, Ontario
Owner: Metrolinx
Engineer: SNC-Lavalin
Vehicle Supplier: Alstom
Other Key Players: Comtech (project mgmt. consultant services)
Funding: Public
- **Provincial:** $528 million

Metrolinx announced the purchase of 61 Citadis Spirit light rail vehicles from Alstom in May 2017. The purchase provides Metrolinx with the flexibility to use the vehicles as needed across its current light rail transit projects, with 17 of the vehicles will be purpose-built for the Finch West LRT project; the remaining 44 available for additional projects underway including the Eglinton LRT and Hurontario LRT. The vehicles are expected to be available in time for use on any of the aforementioned projects in 2021.

86 Wilson Facility Enhancement and Yard Expansion

$506.4 million

2018 Rank: 85
Location: Toronto, Ontario
Owner: TTC
Project/Construction Manager: Bondfield Construction (construction management)
Contractor: Dufferin Construction, a division of CRH Canada (contract for prep work)
Engineer: AECOM, Hatch, TTC
Legal: Osler
Other Key Players: KPMG (advisor for TTC Capital Program Delivery Review); Hanscomb (owner's cost consultant); Comtech (consulting services)
Supplier: Ansaldo; Canam Group; DECAST Ltd. (precast chambers); Dufferin Concrete; Nedco; Nortrak; Powell; Tomlinson; Thales; Twinco
Funding: Public
- **Municipal** TTC: $506.4 million (2015 Capital Budget)

TTC's Wilson Yard is undergoing a significant expansion of the rail yard and supporting maintenance facilities, which is required to accommodate the needs for Toronto Rocket train storage and as a result of the introduction of the Spadina Subway Extension and increasing service demands on Line 1 (Yonge University Spadina). This expansion will add eight new storage tracks to the facility with room to store 16 trains, as well as an expanded car house for servicing Toronto Rocket trains, new run-around connections, and a connection to Downsview station. The entire project is expected to be completed by 2019.

87 Regina Railyard Renewal Project

$500 million

2018 Rank: 87
Location: Regina, Saskatchewan
Owner: City of Regina
Engineer: WSP; Ground Engineering Consultants
Other Key Players: Urban Strategies; Urbanics Consultants; P3A Architecture; WSP (assessment, analysis, ESA)
Funding: Public/Private
- **Municipal:** $47 million
- **Private:** $450 million to $500 million

This is the second phase of the Regina Revitalization Initiative, including the redevelopment of approximately 17.5 acres of vacant downtown land formerly used as a Canadian Pacific intermodal yard. With new offices, shops, and restaurants, there will be new opportunities for work and play, and a variety of housing options will provide distinctive urban living. With a new walkway connecting this lively district to downtown, it will strengthen Regina's culture and nightlife. Urban planning and design, as well as engineering consulting work, is currently taking place as part of a public engagement process. Work has been pushed back, based on other community priorities, and it could now be up to five years before anything concrete happens with the lands.

88 Michael Garron Hospital Project

$498.2 million

NEW

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)
Legal: Blake, Cassels & Graydon (advisor to the proponent)
Other Key Players: EXP
Funding: P3/AFP

Credit: Infrastructure Ontario

The Michael Garron Hospital—Phase 1 new patient care tower project involves the construction of a new eight-storey patient care tower and three-storey connection, as well as demolition of some existing space and renovations to the existing hospital. The project will add up to approximately 550,000 sq. ft. to the existing hospital and renovate approximately 100,000 sq. ft. of select areas within the existing hospital. Construction began in late April 2018 following financial close. Substantial completion of the project is slated for the fall of 2023.

89 London Bus Rapid Transit System

$498 million

NEW

Location: London, Ontario

Owner: City of London

Consultant: IBI Group

Funding: Public

- **Federal** $198 million*
- **Provincial** $170 million
- **Municipal** $130 million

The London bus rapid transit (BRT) system is a proposed 23.7-kilometre system that will run throughout the city's busiest corridors. The current iteration's north-south route runs from the downtown to the city's north end past Western University, and to the south end near Highway 401. The west-east corridor will run west from the downtown past Wonderland Road, and east to the campus of Fanshawe College. The project has received $170 million of provincial funding, and the City of London has budgeted $130 million for the project. While there is under $200 million in funding commitments still outstanding, the federal government contribution for transit funding for the next decade exceeds the amount needed to pay for the balance of the project. If the project is kept to its current timeline, construction is phased and estimated to begin on the east corridor in 2020 and on the north corridor in 2022, with the opening of these corridors in 2023 and 2026 respectively. Construction would then begin on the south corridor in 2023 and on the west corridor in 2025, and open by 2026 and 2028.

**The federal funding has been made available from the federal government, but the City of London has not officially committed the funds to the London BRT project.*

90 Route 389 Improvement Program

$468 million

2018 Rank: 88

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

Owner: Government of Quebec

Engineer: SNC-Lavalin

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

Funding: Public

This 570-kilometre long 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. In July of 2018, the provincial and federal governments confirmed their $468-million commitment to the project.

91 Centerm Expansion Project

$454 million

NEW

Location: Vancouver, British Columbia

Owner: Vancouver Fraser Port Authority

Design-Build contractor: Centennial Expansion Partners—Dragados Canada Inc.; Jacob Bros. Construction Inc.; Fraser River Pile & Dredge Inc.

Engineer: AECOM

Other Key Players: PBX Engineering; Klohn Crippen Berger; WSP; Proactive Infrastructure Consulting

Funding: Public

The Port of Vancouver's Centerm Expansion Project involves a series of improvements to the Centerm container terminal to meet near-term demands for container shipment in the port. The two-thirds increase in capacity would expand by 600,000 20-ft. equivalent unit containers (TEUs), from 900,000 TEUs to 1.5 million TEUs. The project also includes the South Shore Access project, a wide range of road improvements that will benefit the entire south shore port area, including a new Centennial Road Overpass and an extension to Waterfront Road. With the design-build proponent selected, construction was expected to begin in late 2018 or early 2019.

92 Hanlan Watermain Project

$450 million

2018 Rank: 89

Location: Mississauga, Ontario

Owner: Region of Peel

Contractor: McNally Construction Inc. (Contract 1, Lakeshore and Dixie Roads to Golden Orchard Drive); T2DMP (Contract 2, Dixie Road from Golden Orchard Drive to Eastgate Parkway); Southland Technicore Mole JV (Contract 3, Eastgate Parkway and Tomken and Cawthra Roads)

Engineer: Jacobs (detailed design consultant: South Assignment—Contracts 1 & 2); WSP (detailed design consultants: North Assignment—Contract 3); The Municipal Infrastructure Group; GM Blueplan

Environmental Services: AECOM (environmental assessment)

Legal: Borden Ladner Gervais (legal advisor)

Other Key Players: AECOM (preliminary design report); Arup (geotechnical engineering, tunnel design, pipeline and structural design support, engineering and construction phase services); EXP (instrumentation and monitoring); Revay and Associates (project management support services); WSP (consultant and geotechnical); Aon Risk Solutions (risk advisor/broker for preferred proponent on their phases of the project); Golder; AGAT Laboratories

Supplier: Hanson Pipe and Precast (concrete pressure pipe); DECAST Ltd. (concrete pressure pipe, precast chambers); CRH Canada, Dufferin Concrete, Dufferin Aggregates (materials supply)

Funding: Public

- **Municipal**
  Peel Region: $330 million; York Region: $120 million

The Hanlan feedermain will run approximately 14.5 kilometres from the Lakeview Water Treatment Plant on Lake Ontario to the Hanlan Reservoir and Pumping Station. Part of the same project, the 1,500-millimetre-wide Mississauga City Centre Subtransmission Main will run approximately six kilometres from the Hanlan pumping station to the intersection of Cawthra and Burnhamthorpe roads. The entire project is scheduled for completion in 2019.

93 Côte-Vertu Station Underground Garage

$440 million

2018 Rank: 90

Location: Montreal, Quebec

Owner: STM

Project/Construction Manager: SNC-Lavalin

Contractor: Dragados

Engineer: Hatch, SNC-Lavalin, Stantec (engineer consortium)

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

Funding: P3

- **Provincial:** $440 million

The new Côte-Vertu underground garage will double the capacity of the train storage available at the end of the Orange line in Montreal, enabling 20 trains to be stored at the site. A fan of tracks at the entrance of the garage will consist of three tunnels, with two tracks holding eight trains. A connecting track from the garage to the station will provide space for an extra four trains to be parked if necessary. A maintenance pit will also be built as part of the garage project. The additional space for parking trains will allow for a 20 per cent increase in train frequency during peak periods. The project is expected to be completed by 2020.

94 Springbank Off-stream Reservoir

$432 million

NEW

Location: Calgary, Alberta

Owner: Government of Alberta

Engineer: Stantec

Environmental Services: Stantec

Legal: McLennan Ross (Counsel for the Government of Alberta)

Funding: Public

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. Construction will require three years, with the reservoir being functionally operational at a reduced level after two years. The project is expected to be partially complete by fall 2021 and fully complete by the end of 2022. This timeline represents a 10-month delay from previous project expectations.

95 Royal Inland Hospital Patient Care Tower

$417.2 million

NEW

Location: Kamloops, British Columbia

Owner: Interior Health

DB(F)M Team: EllisDon Capital Inc. (team lead); EllisDon Capital Inc. (equity providers); EllisDon Infrastructure (design-builder); Parkin Architects Ltd./Kasian Architects (architect); EllisDon Facility Services Inc. (service provider)

Funding: Public/Private

Financing

The total budget for the entire project, including both phases, is $417.2 million with the province of British Columbia and Interior Health contributing $225.2 million, the Thompson Regional Hospital District contributing $172 million and the Royal Inland Hospital Foundation contributing $20 million.

Credit: Inland Health

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. New parking stalls will be added to the site. Construction of the patient tower got underway in the fall of 2018. The Patient Care Tower is scheduled to open in early 2022, with Phase 2 renovations to be completed in the fall of 2024.

96 Lakeshore West GO Expansion

$401 million

NEW

Location: Toronto, Ontario

Owner: Metrolinx

Engineer: Parsons

Other Key Players: 4-Transit JV (technical advisory services): Hatch, Parsons, WSP; Golder; Morrison Hershfield; Gannett Fleming; Infrastructure Ontario (procurement lead); Rider Levett Bucknall; Comtech (project mgmt. services)

Funding: Public

The Lakeshore West GO Expansion will provide 15-minute service or better each day from Toronto to Burlington, as well as hourly service to and from Hamilton seven days a week. The expansion will also include a station at Port Credit that will link to the future Hurontario light rail transit system. The preferred proponents for the Lakeshore West Infrastructure improvements project will be named in 2019. That portion of the project includes improvements to five stations throughout the corridor, as well as two grade separations and the replacement of one pedestrian bridge.

97 100-Series Highway Improvements

$390 million

2018 Rank: 93
Location: Nova Scotia
Owner: Government of Nova Scotia
Consulting Engineer: CBCL Limited Consulting Engineers (highway corridor study)
Other Key Players: MQO Research (consultation report)
Funding: Public

The Government of Nova Scotia had studied the cost of twinning the 100-series highway network, a total of just over 300 kilometres of highway. An initial report suggested that the cost would be close to $2 billion, a number that forced the province to explore alternative funding mechanisms for the project. Following a resounding rejection by the public of a recommendation to toll sections of the highway to pay for the cost of the project, the province instead decided to move forward with four smaller projects:

- Highway 101, Three Mile Plains to Falmouth, including the Windsor Causeway, 9.5 kilometres;
- Highway 103, Tantallon to Hubbards, 22 kilometres;
- Highway 104, Sutherlands River to Antigonish, including Barneys River, 38 kilometres; and
- construction of the four-lane, divided Burnside Connector (Highway 107) between Burnside to Bedford, 8.7 kilometres.

In July of 2018, the federal and provincial governments announced a combined investment of $195 million towards the Highway 104 project. Construction of that section is to begin in early 2020 and be completed sometime in 2024.

98 CapitalCare Norwood Redevelopment Project

$364 million

NEW

Location: Edmonton, Alberta
Owner: Alberta Health System
Other Key Players: DIALOG (primary consultant)
Funding: Public

The CapitalCare Norwood Redevelopment Project involves a 40,000-sq.-ft. redevelopment of the current CapitalCare Norwood site in Edmonton. The expansion will include the construction of two new buildings: a seven-storey patient tower and an adjacent two-storey structure for outpatient clinics. The tower will include 234 private resident rooms, helping to increase the bed count at the centre from 205 to 350 beds. The current design calls for a Y-shaped tower, which will allow for natural light to reach every patient room. The adjacent building will include a new dialysis unit and a Centre for Lung Health. It will also include a garden on the roof that can be utilized by patients. The RFP for the project was released in April 2018, with the successful proponent selected in early 2019. Construction is set to begin in the summer of 2019 and run until 2023.

99 Université de Montréal Science Complex

$348.3 million

2018 Rank: 96
Location: Montreal, Quebecc
Owner: Université de Montréal
Project Manager: DECASULT (Phase 1)
Contractor: EBC Inc.
Engineer: Bouthillette Parizeau Inc., PMA Engineering, SNC-Lavalin (engineer consortium); SDK (civil and structural engineers)
Architects: MSDL; Lemay; NFOE
Environmental Services: WSP (environmental/acoustic)
Other Key Players: Englobe (QC and roofing inspection services)
Supplier: Canam Group
Funding: Public/Private
- **Provincial:** $173.4 million
- **Université de Montréal:** $176.6 million

The first building of the new Outremont Yards campus, the 650,000-sq.-ft. science complex at the Université de Montréal will provide a home for 2,200 students in the fields of biological science, physics, chemistry, geography, and materials engineering. Financial contributions from the provincial and federal governments helped to cover costs associated with the decontamination of the site, which also includes five hectares for green space. The project is expected to be completed in time for the start of the 2019-2020 school year.

100 Woodward Wastewater Treatment Plant

$340 million

2017 Rank: 99
Location: Hamilton, Ontario
Owner: City of Toronto
Contractor: Maple/Ball JV—Maple Reinders and Ball Construction (Raw Sewage Pumping Station); Alberici Contractors (Electrical and Chlorination System Upgrades)
Legal: Blake, Cassels & Graydon (advised the City of Hamilton)
Other Key Players: CIMA+
Funding:
- **Federal:** $100 million
- **Provincial:** $100 million
- **Municipal:** $140 million

Financing

Both the federal and provincial governments pledged $100 million each to the project. The City of Hamilton is responsible for all remaining costs.

The Woodward Wastewater Treatment Plant project is one of several measures being implemented to address concerns over the quality of the water in Hamilton Harbour. This multi-stage project will have a direct impact on the health of the local enviroment, specifically the water quality in the harbour. The project includes: new raw sewage pumping station; new energy centre/electrical upgrades; the addition of a tertiary level of treatment; new chlorine contact tank; upgrades to the Red Hill Creek outfall; and upgrades to the collection system. Construction of two phases are underway with the third, the tertiary treatment upgrades, new chlorine contact tank, and improvements to Red Hill Creek to begin in Q1 2019.

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