

Top 100

Canada's Biggest Infrastructure Projects

ReNew
CANADA
The Infrastructure Magazine

2016

top100projects.ca





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ReNew

CANADA
The Infrastructure Magazine

Top100 Projects — 2016

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Top100 Turns 10

ReNew Canada has produced the Top100 Projects report for the past decade, and since its inaugural edition in 2007, the list has grown by leaps and bounds. This year, 25 newcomers—more than a quarter of the list with a total valued at \$25.3 billion—were welcomed to the list, taking the place of projects that were completed, changed scope, or were terminated by 2016.

The list has grown significantly over last year. This year, the country's 100 largest projects represent a total investment of \$161.3 billion, a lean two-per-cent increase over 2015's \$157.9 billion. This can be attributed to a significant increase in transit spending across the country, along with a series of big-ticket transportation and energy projects that have been mainstays on the list for the past few years.

While the transit sector only grew by two projects (from 17 to 19), total value grew by 44 per cent to \$39.8 billion. This is due in part to two new projects in the Top 20: the \$4.5-billion Green Line LRT, which is still in early stages but has been boosted by recent federal funding pledges; and the second stage of Ottawa's LRT development, pegged at around \$3 billion. Most significantly, Toronto's Eglinton Crosstown LRT (formerly No. 5 on the list) announced the total value of the project over 30 years was \$9.1 billion (with capital costs of \$5.3 billion), making it the No. 1 project this year.

Overall, the list continues to be dominated by energy developments, with hydroelectric generation claiming four of the top five spots: Site C in British Columbia (\$8.8 billion), Muskrat Falls in Newfoundland and Labrador (\$6.99 billion), Romaine in Quebec (\$6.5 billion), and Keeyask in Manitoba (\$6.5 billion). In energy overall, the total number of projects fell from 31 to 27 and value dropped eight per cent to \$57.5 billion. Part of the drop was the two large developments completed construction in 2015: Ontario's \$2.6-billion Lower Mattagami River Project and the \$1.65-billion Western Alberta Transmission Line. Across all energy sectors, the list represents 16,417 megawatts (MW) in new or refurbished generation potential (down from 18,208 in 2015).

The rest of list includes 22 transportation projects (\$39.1 billion), 22 buildings (\$17 billion), six water and wastewater developments (\$3.5 billion), two remediation (\$2.2 billion) projects, one carbon capture project (\$1.2 billion), and one waste management project (\$1 billion).

As for the list's criteria, by "top" we mean "highest total cost." To secure a spot, projects must be underway with a reasonable shot at progressing forward—whether it's undergoing an environmental assessment, in procurement, or under construction. As in past years, oil and gas pipelines aren't included as they typically aren't public works and are seen as too big; including them would skew the list's top spots.

We are constantly striving to make our list better. So while we strive to include all possible projects and key players, sometimes there are oversights. Please let us know if you or a company you know was involved on any of these projects, or if there is a project missing, by contacting us at top100@actualmedia.ca or visit top100projects.ca/submit-a-project.

André Voshart, Editor, ReNew Canada



To create your own report, visit top100projects.ca/2016filters
and sort by project cost, key players, location, sector, and more.

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TEAM



Top100 Project Index

By Rank, Project Title, and Page Reference

Buildings

| rank | project title | page # |
|------|---------------|--------|
|------|---------------|--------|

Education

| | | |
|----|---------------------------|----|
| 73 | Joint-Use Schools Project | 63 |
|----|---------------------------|----|

Health Care

| | | |
|----|--|----|
| 69 | BC Children & Women's Hospital/Health Centre Redevelopment | 61 |
|----|--|----|

| | | |
|----|---|----|
| 16 | CHUM (Centre hospitalier de l'université de Montréal) Redevelopment | 28 |
|----|---|----|

| | | |
|----|----------------------------------|----|
| 72 | Grande Prairie Regional Hospital | 62 |
|----|----------------------------------|----|

| | | |
|----|---|----|
| 99 | Joseph Brant Hospital Redevelopment and Expansion Project | 70 |
|----|---|----|

| | | |
|----|------------------------------------|----|
| 85 | Milton District Hospital Expansion | 66 |
|----|------------------------------------|----|

| | | |
|----|------------------------------|----|
| 57 | New Cancer Centre in Calgary | 56 |
|----|------------------------------|----|

| | | |
|----|------------------------------|----|
| 80 | New Hospital in Corner Brook | 65 |
|----|------------------------------|----|

| | | |
|----|--------------------------------|----|
| 76 | North Island Hospitals Project | 64 |
|----|--------------------------------|----|

| | | |
|----|---|----|
| 84 | Peel Memorial Centre for Integrated Health and Wellness | 66 |
|----|---|----|

| | | |
|-----|---------------------------------|----|
| 100 | Peter Gilgan Patient Care Tower | 70 |
|-----|---------------------------------|----|

| | | |
|----|--------------------------|----|
| 60 | Providence Care Hospital | 57 |
|----|--------------------------|----|

| | | |
|----|---|----|
| 52 | Sainte-Justine University Hospital Centre | 53 |
|----|---|----|

| | | |
|----|--|----|
| 97 | Saskatchewan Hospital North Battleford | 69 |
|----|--|----|

| | | |
|----|--|----|
| 63 | Stanton Territorial Hospital Renewal Project | 59 |
|----|--|----|

Military

| | | |
|----|---|----|
| 95 | Canadian Forces Base Esquimalt A and B Jetty Recapitalization Project | 69 |
|----|---|----|

| | | |
|----|--|----|
| 55 | Canadian Forces Base Trenton Expansion | 55 |
|----|--|----|

Public Spaces

| | | |
|----|-------------------|----|
| 22 | 45-141 Bay Street | 34 |
|----|-------------------|----|

| | | |
|----|--------------------------------------|----|
| 61 | Union Station Revitalization Project | 58 |
|----|--------------------------------------|----|

Social Infrastructure

| | | |
|----|---|----|
| 70 | Regina Revitalization Initiative – New Mosaic Stadium | 62 |
|----|---|----|

| | | |
|----|----------------------------|----|
| 75 | Rogers Place Arena Project | 63 |
|----|----------------------------|----|

| | | |
|----|----------------------|----|
| 98 | Royal Alberta Museum | 70 |
|----|----------------------|----|

Energy

| rank | project title | page # |
|------|---------------|--------|
|------|---------------|--------|

Hydroelectric

| | | |
|----|--|----|
| 77 | Gordon M. Shrum Generating Station Refurbishment | 64 |
|----|--|----|

| | | |
|----|--|----|
| 46 | John Hart Generating Station Replacement Project | 50 |
|----|--|----|

| | | |
|---|-------------------------------|----|
| 5 | Keeyask Hydroelectric Project | 18 |
|---|-------------------------------|----|

| | | |
|----|--------------------------------|----|
| 67 | Marmora Pumped Storage Project | 61 |
|----|--------------------------------|----|

| | | |
|---|-----------------------|----|
| 3 | Muskrat Falls Project | 14 |
|---|-----------------------|----|

| | | |
|----|---|----|
| 28 | Renovations to Beauharnois Generating Station | 43 |
|----|---|----|

| | | |
|---|-----------------|----|
| 4 | Romaine Complex | 16 |
|---|-----------------|----|

| | | |
|----|-----------------------------------|----|
| 64 | Ruskin Dam and Powerhouse Upgrade | 59 |
|----|-----------------------------------|----|

| | | |
|---|-----------------------------|----|
| 2 | Site C Clean Energy Project | 12 |
|---|-----------------------------|----|

| | | |
|----|--------------------------------|----|
| 87 | Tazi Twé Hydroelectric Project | 67 |
|----|--------------------------------|----|

| | | |
|----|------------------------------|----|
| 90 | Upper Lillooet Hydro Project | 67 |
|----|------------------------------|----|

Natural Gas

| | | |
|----|-----------------------------------|----|
| 35 | Genesee 4 & 5 Generation Stations | 45 |
|----|-----------------------------------|----|

| | | |
|----|----------------------------|----|
| 31 | Great Spirit Power Project | 44 |
|----|----------------------------|----|

| | | |
|----|--------------------------------------|----|
| 54 | Sunrise Natural Gas Processing Plant | 54 |
|----|--------------------------------------|----|

| | | |
|----|--------------------------|----|
| 50 | The Milner Energy Centre | 52 |
|----|--------------------------|----|

Nuclear

| | | |
|----|---|----|
| 15 | Darlington Refurbishment Project – Definition Phase | 28 |
|----|---|----|

Transmission

| | | |
|---|------------------------------|----|
| 7 | Bipole III Transmission Line | 20 |
|---|------------------------------|----|

| | | |
|----|---|----|
| 34 | Chamouchouane–Bout-de-l'Île Transmission Line | 45 |
|----|---|----|

| | | |
|----|------------------------------------|----|
| 78 | East–West Tie Transmission Project | 64 |
|----|------------------------------------|----|

| | | |
|----|---|----|
| 33 | Fort McMurray West Transmission Project | 45 |
|----|---|----|

| | | |
|----|--------------------------|----|
| 71 | Juan de Fuca Power Cable | 62 |
|----|--------------------------|----|

| | | |
|----|-----------------------|----|
| 30 | Maritime Link Project | 43 |
|----|-----------------------|----|

| | | |
|----|-----------------------------------|----|
| 38 | Romaine Complex Transmission Line | 47 |
|----|-----------------------------------|----|

| | | |
|----|-------------------------------------|----|
| 37 | Wataynikaneyap Transmission Project | 46 |
|----|-------------------------------------|----|

Wind

| | | |
|----|---------------------------|----|
| 48 | Henvey Inlet Wind Project | 51 |
|----|---------------------------|----|

| | | |
|----|----------------------------|----|
| 92 | Meikle Wind Energy Project | 68 |
|----|----------------------------|----|

| | | |
|----|---------------------------|----|
| 88 | Nicolas-Riou Wind Project | 67 |
|----|---------------------------|----|

Other

| rank | project title | page # |
|------|---------------|--------|
|------|---------------|--------|

Carbon Capture

| | | |
|----|---------------------------|----|
| 41 | Alberta Carbon Trunk Line | 48 |
|----|---------------------------|----|

Remediation

| | | |
|----|--------------------------------|----|
| 53 | Giant Mine Remediation Project | 54 |
|----|--------------------------------|----|

| | | |
|----|---------------------------|----|
| 39 | Port Hope Area Initiative | 47 |
|----|---------------------------|----|

Waste Management

| | | |
|----|--------------------------|----|
| 49 | Deep Geologic Repository | 51 |
|----|--------------------------|----|

Water-Wastewater

| | | |
|----|---|----|
| 83 | Annacis Island Wastewater Treatment Plant Expansion | 66 |
|----|---|----|

| | | |
|----|---|----|
| 79 | Bonnybrook Wastewater Treatment Plant D Expansion | 65 |
|----|---|----|



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DECAST Ltd. would like to congratulate all those on the ReNew Canada's Top 100 Infrastructure Projects list. DECAST would like to thank our customers and all those involved in the following projects:

- CIBC Pan Am and Parapan Am Athletes' Village (Infrastructure Ontario)
- Confederation Line (City of Ottawa)
- Eglinton Crosstown LRT (Metrolinx)
- Hanlan Water Projects (Region of Peel)
- Highway 407 East Extension – Phase 1 (MTO)
- Spadina Subway Extension (TTC)
- Union-Pearson Express Spur Line (Metrolinx)
- Wilson Facility Enhancement and Yard Expansion (TTC)
- York Viva Bus Rapid Transit – viva Next (Metrolinx, York Region Rapid Transit Corporation)

We are proud to have been given the opportunity to supply precast concrete products in these projects and we look forward to continuing our valued relationships and providing *Leading Infrastructure Solutions*.

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Top100 Project Index (continued)

By Rank, Project Title, and Page Reference

| | | |
|----|--|----|
| 93 | Hanlan Water Project | 68 |
| 66 | Lions Gate Secondary Wastewater Treatment Plant | 60 |
| 82 | North End Sewage Treatment Plant Biological Nutrient Removal Upgrade | 65 |
| 74 | Regina Wastewater Treatment Plant | 63 |

Transit

rank project title page #

BRT

| | | |
|----|---|----|
| 81 | Southwest Rapid Transitway (Stage 2) and Pembina Highway Underpass Project | 65 |
| 36 | York VIVA Bus Rapid Transit (vivaNext) | 46 |

LRT

| | | |
|----|---|----|
| 20 | Confederation Line | 32 |
| 26 | Edmonton Valley Line – Stage 1 | 42 |
| 1 | Eglinton Crosstown LRT | 10 |
| 32 | Evergreen Line Rapid Transit Line | 44 |
| 42 | Finch West LRT | 49 |
| 8 | Green Line LRT | 20 |
| 29 | Hurontario LRT | 43 |
| 43 | New TTC Light-Rail Vehicles | 49 |
| 13 | Ottawa LRT – Stage 2 | 24 |
| 59 | Region of Waterloo ION LRT – Stage 1 | 57 |

Rail

| | | |
|----|---|----|
| 56 | East Rail Maintenance Facility | 56 |
| 89 | Leslie Barns and Connection Track Project | 67 |
| 65 | Union Station Infrastructure Renewal Program | 60 |

Subway

| | | |
|----|--|----|
| 18 | Montreal Metro Car Replacement | 30 |
| 11 | Scarborough Subway Extension | 24 |
| 14 | Spadina Subway Extension | 26 |
| 86 | Wilson Facility Enhancement and Yard Expansion | 66 |

Transportation

rank project title page #

Airport

| | | |
|----|--|----|
| 21 | Calgary International Airport Development Project | 32 |
| 96 | Iqaluit International Airport Improvement Project | 69 |
| 27 | Vancouver International Airport Upgrades | 42 |

Bridge

| | | |
|----|---|----|
| 12 | George Massey Tunnel Replacement Project | 24 |
| 19 | Gordie Howe International Bridge | 31 |
| 9 | New Champlain Bridge Corridor Project | 22 |

Highway

| | | |
|----|---|----|
| 45 | East Side Transportation Initiative | 50 |
| 17 | F.G. Gardiner Expressway Strategic Rehabilitation Plan | 30 |
| 47 | Highway 407 East Extension – Phase 1 | 51 |
| 44 | Highway 407 East Extension – Phase 2 | 49 |
| 40 | Highway 63 Twinning Program | 48 |
| 51 | Highway Claude-Bécharde (Highway 85) – Phase 3 | 52 |
| 62 | Highway Claude-Bécharde (Highway 85) – Phases 1 and 2 | 58 |
| 94 | Kicking Horse Canyon Project – Phase 4 | 69 |

| | | |
|----|---|----|
| 25 | Northeast Anthony Henday Drive | 40 |
| 24 | Regina Bypass Project | 40 |
| 91 | Route 389 Improvement Program | 68 |
| 6 | Southwest Calgary Ring Road | 18 |
| 68 | Trans Labrador Highway Widening and Hard Surfacing | 61 |
| 10 | Turcot Interchange | 22 |

Port

| | | |
|----|--|----|
| 58 | Fairview Container Terminal (Prince Rupert Container Terminal Expansion) | 57 |
| 23 | Roberts Bank Terminal 2 Project | 34 |

Figures

page #

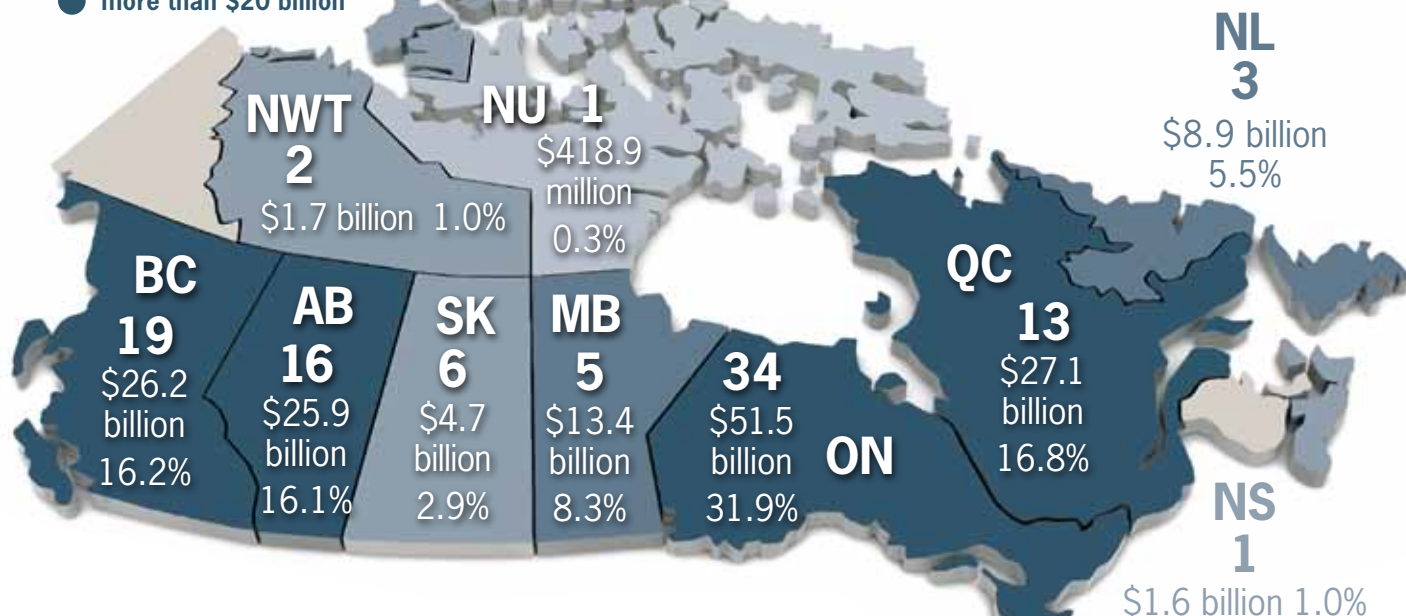
| | |
|--------------------------------|----|
| Projects & Sectors by Province | 8 |
| Projects by Sector | 8 |
| Total Investment | 36 |
| Projects by Year of Completion | 36 |
| Transit Expansion | 27 |
| Energy Development in Canada | 41 |
| A Decade of Top100 | 45 |
| Health Care Breakdown | 50 |
| Project Delivery | 54 |

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
- less than \$1 billion
- \$1-\$5 billion
- \$5.1-\$20 billion
- more than \$20 billion

Number of Projects by Province with Total Project Value



Sectors by Province

| | BC | AB | SK | MB | ON | QC | NS | NL | NWT | NU |
|----------------|----|----|----|----|----|----|----|----|-----|----|
| Energy | 8 | 4 | 1 | 3 | 5 | 5 | 1 | 1 | | |
| Buildings | 3 | 4 | 3 | | 8 | 2 | | 1 | 1 | |
| Transit | 1 | 2 | | 1 | 14 | 1 | | | | |
| Transportation | 5 | 4 | 1 | 1 | 4 | 5 | | 1 | | 1 |
| Other | 2 | 2 | 1 | 1 | 3 | | | | 1 | |

Projects by Sector

Energy

| | | | | | |
|---------------|--------------|-------------|------|---------|------|
| Hydroelectric | Transmission | Natural Gas | Wind | Nuclear | Coal |
| 11 | 8 | 4 | 3 | 1 | 0 |

Transit

| | | | |
|-----|--------|-----|------|
| LRT | Subway | BRT | Rail |
| 10 | 4 | 2 | 3 |

Buildings

| | | | |
|-------------|-----------------------|---------------|----------|
| Health Care | Social Infrastructure | Public Spaces | Military |
| 14 | 3 | 3 | 2 |

Transportation

| | | | |
|---------|--------|---------|------|
| Highway | Bridge | Airport | Port |
| 14 | 3 | 3 | 2 |

Other

| | | | |
|------------------|-------------|----------------|------------------|
| Water/Wastewater | Remediation | Carbon Capture | Waste Management |
| 6 | 2 | 1 | 1 |

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YVR Airside Operations Building



Credit: Crosslinx Transit Solutions

Renderings are illustrative only and subject to change.

1 Eglinton Crosstown LRT

\$9.1 billion



2015 Rank: 5

Location: Toronto, Ontario

Owner: Metrolinx

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

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)

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

Consulting Engineer: CH2M and 4 Transit—WSP | MMM Group, Hatch, and Parsons (Metrolinx technical advisors); AECOM (consulting engineer, preliminary planning/study, design)

Architect: IBI Group and SNC-Lavalin

Vehicle Supplier: Bombardier

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

Other and Legacy Players: WSP | Parsons Brinckerhoff (program manager and engineer); McCormick Rankin; Arup (preliminary design work); URS/Parsons (systems design); Golder Associates (owner's geoengineering consultant); Entuitive (structural eng. consultant); Obayashi Canada, Kenny Construction, Kenaidan Contracting, and Technicore (contractors); Golder Associates; Entro; exp Services; Infrastructure Ontario; Caterpillar; DLA Piper (Canada) (counsel); BTY Group (independent certifier); Dufferin Construction (prep work); McMillen Jacobs Associates (independent verifier); Norton Rose Fulbright; Hanscomb (preliminary and concept designers' cost consultant for 7 stations); Ernst & Young (advising gvt.); Aon (risk/insurance advisor to authority)

Funding: P3

Financing

In November 2015, it was announced the total value of the project over 30 years was \$9.1 billion, with capital costs at \$5.3 billion. Each member of the Crosslinx consortium, including related construction and maintenance affiliates, is an equal partner with a 25-percent interest in the equity, development, construction, and maintenance activities of the project. The project is financed through a mix of private equity, bonds, and loans.

This LRT transit line will run along Toronto's Eglinton Avenue between Mount Dennis (Weston Road) and Kennedy Station. Part of the Government of Ontario's LRT plan for the city, this 19-kilometre corridor will include an 11-kilometre underground portion between Keele Street and Laird Drive. When running at street level, the line will carry passengers in dedicated right-of-way transit lanes separate from regular traffic with priority signaling at intersections. Travelling at an average speed of 28 km/h, it will link to 54 bus routes, three subway stations, and various GO Transit lines. The capacity of the LRT vehicles is 15,000 passengers per hour per direction, with the flexibility to easily remove or add cars. Projected ridership is 5,400 passengers per hour in the peak direction by 2031. Construction is estimated to be completed by 2021.



Confederation Line
Ottawa, Ontario



Eglinton Crosstown LRT
Toronto, Ontario



Ruskin Dam & Powerhouse Upgrade
Ruskin, British Columbia



New Champlain Bridge Corridor Project
Montreal, Quebec



Northeast Anthony Henday Drive
Edmonton, Alberta

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Credit: BC Hydro

2 Site C Clean Energy Project

\$8.775 billion 

2015 Rank: 1

Location: Near Fort St. John, British Columbia

Owner: BC Hydro

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

Engineer: Kohn Crippen Berger and SNC-Lavalin (engineering and design - dam and reservoir); Tetra Tech; BGC Engineering; WSP; R.F. Binnie & Associates; Lasalle | NHC (engineering and design - other)

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

Legal: Dentons Canada (owner's counsel); Bennett Jones (acted for successful proponent)

Supplier: Advanced Precast

Other: AL Sims and Sons (road improvements); Aon (insurance broker to authority); BTY Group (cost consultant); Hatch (environmental permitting); McMillen Jacobs Associates (dam/tunnel analyses, design of tunnel support); Morgan Construction and Environmental (north bank); Paul Paquette & Son's Contracting (south bank)

Funding: Public (with P3 component; see below)

• **Provincial** BC Hydro: \$8.775 billion

This proposed 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.

Construction started in July 2015 with site preparation activities, including clearing work, building access roads, and starting construction of a worker accommodation camp. Contractors are also upgrading public roads used to access the dam site. The project is expected to be completed in 2024.

Worker Accommodation Project Cost: \$470 million

In October 2015, BC Hydro signed an eight-year P3 contract for the design, construction, partial financing, operation, and maintenance of a temporary camp located on the north bank of the Peace River. This contract—included in the overall Site C project cost—may include additional scope related to construction site infrastructure and services. It will be built to house up to 1,600 construction workers, with services and utilities designed to accommodate a total of 2,200. To minimize the impact on nearby communities, the camp will be self-sufficient and designed to accommodate a fluctuating number of workers.

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

Other: Helical Pier Systems (pile work); Northern Geo (compaction testing); Petrowest Construction (site preparation work); WSP Canada (surveying work)



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- > Regina Bypass
- > North Island Hospital
- > Site C Clean Energy Project

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Credit: Nalcor Energy

3 Muskrat Falls Project

\$7.65 billion 

2015 Rank: 2

Location: Muskrat Falls, Newfoundland and Labrador

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

Engineer: Nalcor Energy and SNC-Lavalin

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

Financiers: 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 Lafleur Henderson (counsel to Emera); McCarthy Tétrault (TD Securities/Goldman Sachs)

Supplier: Lafarge and Holcim Canada (cement); Canam Group

Other: IKC-ONE—Innu Kiewit Constructors, H.J. O'Connell, Neilson, and EBC (rock and overburden excavation); Hatch (engineering services); Golder Associates; Lafarge and Holcim Canada (cement); Ernst & Young (advising gvt.); Aon (risk/insurance advisor to authority)

Funding: Public/Private

Nalcor Energy leads this development, which includes construction of an 824-MW 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. Detailed engineering and design for the project is substantially complete and 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. Contracts are in place for the majority of work and is expected to be completed in June 2018.

Financing

Project funding is derived from

- \$5 billion in Government of Canada guaranteed, long-term bonds issued in the public debt markets in December 2013;
- equity contributions from the province; and
- equity contributions from Emera relating to their partnership interest in the Labrador–Island Link.

In December 2012, the projects were sanctioned with the direct facilities capital cost of \$6.2 billion plus financing costs to be capitalized during the period up to their in-service date. In June 2014, the direct facilities capital cost for the projects was updated. External market pressures, combined with strategic investments to enhance system reliability, operation, and productivity throughout construction, resulted in a cost forecast of \$6.99 billion. In September 2015, Nalcor revised the project budget from \$6.99 billion to \$7.65 billion.

Numbers Breakdown

\$3.686 billion for the Muskrat Falls Generation Facility

\$3.089 billion for the Labrador–Island Transmission Link

\$877.6 million for Labrador transmission assets



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Credit: SNC-Lavalin

4

Romaine Complex

\$6.5 billion 

2015 Rank: 3

Location: Havre-Saint-Pierre, Quebec

Owner: Hydro-Québec

Engineer: Romaine-1: AECOM

Romaine-2 (*commissioned*): Groupe RSW and SNC-Lavalin

Romaine-3: AECOM

Contractor: Romaine-1: Hamel-CRT, Cegerco, Construction Proco, a consortium of Cegerco and Fernand Gilbert, Groupe Hexagone, Pomerleau, a consortium of J. Euclide Perron and Inter-cité Construction, a consortium of Neilson & EBC Construction, LAR Machinerie and Canmec Industriel
Romaine-2 (*commissioned*): Hamel-CRT, EBC-Neilson, Cegerco Inc., Fernand Gilbert, Groupe LAR, Produits Forestiers Innus, Les Excavations Marchand et Fils, Demathieu & Bard-Nordex, Canmec Industriel, Les Constructions BLH, Construction Polaris, Consortium P.O.C, Les Carrières Bob-Son

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

Turbine Supplier: Romaine-1: Voith Hydro
Romaine-3: GE Energy (formerly Alstom)

Other: Tetra Tech (design and construction support); WSP (EA and access roads)

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 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 2011. Work is continuing as scheduled, with work on Romaine-1 and Romaine-3 underway. An average of 975 workers is estimated for the project with a peak workforce of over 2,000 workers from 2012 to 2016. Romaine-2 was commissioned in 2014, and Romaine-1, Romaine-3, and Romaine-4 are expected to be online in 2016, 2017, and 2020, respectively.

PROJECT TIMELINE:





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Since 2008, the Protocol has been applied 45 times in Canada and twice internationally to:

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- storm water and wastewater systems
- water supply and management systems
- roads, bridges and culverts
- electricity distribution
- airport infrastructure

These assessments provide concrete recommendations to make informed engineering judgments on what components require adaptation as well as how to adapt them.

The implementation of the Protocol's recommendations enable infrastructure owners to properly plan and implement actions to reduce the economic, social and human impacts of climate change.

Learn more about assessing climate change impacts on public infrastructure:



5 Keeyask Hydroelectric Project

\$6.5 billion 

2015 Rank: 4

Location: Lower Nelson River, Manitoba

Owner: Keeyask Hydropower Limited Partnership (KHLP)

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

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

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

Legal: Fasken Martineau DuMoulin (advised Manitoba Hydro)

Supplier: Voith

Other: Aon (risk/insurance advisor to authority); Golder Associates (info mgmt. solution services); Hanscomb (owner's cost consultant and special advisor)

Funding: Public

• **Provincial/First Nations:** \$6.5 billion



Credit: Manitoba Hydro

This 695-MW 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.

Construction began in summer 2014. The station's first unit is scheduled to go into service in 2019, with all units commissioned by December 2020.

6 Southwest Calgary Ring Road

\$5 billion 

2015 Rank: 7

Location: Calgary, Alberta

Engineer: CH2M (owner's engineer); COWI North America (concept design of highway interchanges)

Legal: Gowling Lafleur Henderson (counsel to Alberta Transportation)

Other: Ernst & Young; LeighFisher (lenders technical advisor); WSP (functional planning and preliminary eng. services)

Funding: P3

• **Federal**
National Infrastructure Component of the New Building Canada Fund: up to \$582.9 million

• **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.

The land transfer is proceeding, and the government is focusing on the delivery of the southwest section of the ring road, which is scheduled to be open to traffic in fall 2022.



Credit: WSP

Financing

The 2015 Alberta budget allocates \$2.9 billion over the next five years toward the construction of Alberta's ring roads, including funds needed to complete Edmonton's Anthony Henday Drive as well as beginning work on this road.

In September 2015, the Alberta government asked three groups to submit proposals using a DBFOM P3:

- **Mountain View Partners:** Meridiam Infrastructure, Kiewit, and Alberta Highway Services Ltd.
- **Southwest Connect:** HOCHTIEF PPP Solutions North America, ACS, Aecon, Carillion, Flatiron Constructors
- **Valley Link Partners:** VINCI Concessions/Construction, Acciona, and Eurovia

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7 Bipole III Transmission Line

\$4.6 billion



2015 Rank: 8

Location: Winnipeg, Manitoba

Owner: Manitoba Hydro

Construction Manager: Tetra Tech

Engineer: Teshmont Consultants (owner's engineer on converter stations); Stantec (converter station civil design); Sigfasson Northern (Keewatinooow civil site development)

Contractor: Siemens and Mortenson Canada (design, supply, and install high-voltage DC equipment and buildings)

Legal: Fasken Martineau DuMoulin (represented Manitoba Hydro)

Supplier: Outland Camps (Keewatinok camp supply); SNC-Lavalin (Keewatinok switchyard supply); Voith (design/install synchronous condensers)

Other: Aon (risk/insurance advisor to authority); CMC Consultants (initial routing study); Joro Consultants and Wildlife Resources Consulting Services (wildlife impact); WSP | MMM Group (geomatics services); North/South Consultants (environmental)

Funding: Public

• **Provincial** Manitoba Hydro: \$4.6 billion

In Manitoba, more than 70 per cent of its hydro runs south over Bipole I and II, side-by-side transmission lines in the Interlake region. The close proximity of the two lines makes the province's electricity supply vulnerable in the event of a weather incident or forest fire. The Bipole III line is designed to be an alternate path for electricity distribution, enhancing the reliability of Manitoba Hydro's electrical system. The project includes construction of a 500,000-volt DC transmission line and two converter stations. The transmission line will run along the west side of Manitoba, from the Keewatinok Converter Station down to Riel Converter station, to be located near Winnipeg. The preferred route is about 1,384 kilometres. The line and its increasing costs have sparked considerable debate throughout the province. Bipole III will also provide for additional transmission capability to accommodate new northern generating stations (such as the Keeyask Generating Station) as those plants come on line in future years.

Construction began in 2013 with civil site preparation for the Keewatinok station, construction power, clearing of northern components of transmission lines, and installation of foundations, as well as continued development of the Keewatinok Camp. Clearing and installation of foundations will continue on the transmission line, and AC collector line construction will be underway within the next year. The line's anticipated in-service date is 2017.

Financing

With the majority of contract costs now committed, the control budget for the project is \$4.6 billion, up from the preliminary estimate of \$3.28 billion, published in a previous year's guide. A number of factors contributed to the increase over the estimate, which was prepared in the early planning stages. The most

significant cost driver was the direct current converter technology adopted. Others included an increase in the carrying capacity of the line by 15 per cent over the original design, additional towers due to route adjustments, and camp improvements to help attract workers.

8 Green Line LRT

\$4.5 billion



NEW

Location: Calgary, Alberta

Owner: City of Calgary

Engineer: Hatch

Consulting Architect: Sturgess Architecture; IBI Group

Funding: Public

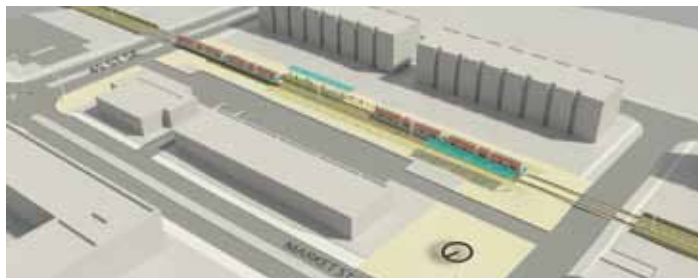
• **Federal** Public Transit Fund:

\$1.53 billion

• **Municipal**

\$52 million

annually over the next 10 years (potentially 30 years)



Credit: City of Calgary

Financing

In July 2015, a federal funding announcement was made for the line, which may change how the line is implemented: up to \$1.5 billion from the Public Transit Fund. The City of Calgary is now waiting to hear if the other two thirds of the funding will be provided from other levels of government. Although Alberta's Budget 2015 doesn't address the city's Green Line expansion, Calgary Mayor Naheed Nenshi remains hopeful the province will step up to the plate.

The Green Line will span 40 kilometres, from North Pointe in the north to Seton in the southeast, almost doubling the size of Calgary's LRT network. The line will run low-floor trains, enabling the stations along the route to be integrated into neighbouring communities, and providing better accessibility for customers. 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.

Construction is scheduled to start in 2017, but this may change based on funding.

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9

New Champlain Bridge Corridor Project

\$4.24 billion 

2015 Rank: 6

Location: Montreal to Brossard, Quebec

Owner: Infrastructure Canada

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

Program Manager: Infrastructure Canada

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

Financiers/Banks: HSBC and National Bank of Canada

Legal: Dentons Canada (advising federal government)

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

Other: PricewaterhouseCoopers; Steer Davies Gleave; Morrison Hershfield (business case); LVM, Consortium Perron, Hudon, Bélanger and Consultants (advisory services to government); Hanscomb (cost consultant and special advisor); Ernst & Young (advising team); Aon (risk/insurance advisor to private partner); INTECH (insurance advisor)

Funding: P3

• **Federal** \$4.239 billion

This corridor-wide project not only includes the new Champlain bridge, but a new île-des-Sœurs 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. The estimated date of completion is 2019.

10

Turcot Interchange

\$3.67 billion 

2015 Rank: 9

Location: Montreal, Quebec

Owner: Transports Québec

Project/Construction Manager: AECOM and BPR-Batiment

Engineer: Consortium Génivar/Dessau; Consortium Inspec-Sol inc./EXP; Consortium SNC-Lavalin/Cima + ; CIMA + (feasibility study); Dessau; Inspec-Sol inc.; LVM (environmental, geotechnical and materials engineering); WSP | MMM Group (independent engineer); Tetra Tech (part of owner's engineer team)

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

Traditional Contracts: Axxys Construction; CMS Entrepreneurs généraux; Construction Demathieu & Bard; Construction DJL; Construction Garnier; DB-AECOM Pont St-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 Arsénault 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); Sėti Media (environmental study); Tecsub

Financiers/Banks: PricewaterhouseCoopers

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

Supplier: Canam Group

Other: WSP (designer, environmental, geotechnical work); Arup (technical advisor, independent certifier); AOR (geotechnical study); Axor experts-conseils (site supervision); Coentreprise Groupe Qualitas/LVM-Technisol (geotechnical study); ConsultRail (study on railway equipment); Daniel Arbour & associates, S.E.N.C. (study on highways); Ethnoscop (archaeological studies); Génies 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 (insurance broker)

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 a temporary public transit bypass at Notre Dame and Angrignon Boulevard West has been completed to minimize the impact of the Turcot Interchange reconstruction. The project is expected to be completed by 2020.



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11 Scarborough Subway Extension

\$3.56 billion 

2015 Rank: 11

Location: Scarborough, Ontario

Owner: TTC

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

Engineer: SNC-Lavalin

Environmental Services: AECOM (EA)

Other: Aon (risk/insurance advisor to authority); Ernst & Young (advising gvt.); Golder Associates (owner's consultant); Hanscomb (station designer's cost consultant)

Funding: P3

- **Federal** Building Canada Fund: \$660 million
- **Provincial** \$1.99 billion
- **Municipal** TTC: \$990 million (\$165 million, development charges; \$745 million, property tax)

This subway extension will extend the Bloor-Danforth subway line approximately 7.6 kilometres from Kennedy Station to Sheppard Avenue and McCowan Road. This new line will provide convenient connections with local and regional bus services and other rapid transit planned for the area and for customers walking and cycling to or being dropped off at the planned stations.

TTC has provided a preliminary project schedule: From 2014 to 2016, the plan is to undertake P3 screening and recommend delivery methodology; consultant procurement; and the preliminary engineering and transit project assessment process. From 2016 to 2018, the commission will begin property acquisition, design, and acquire/retrofit tunnel boring machines. Then, from 2018 to 2023, the line will undergo construction.

12 George Massey Tunnel Replacement Project

\$3 billion 

2015 Rank: 12

Location: Delta to Richmond, British Columbia

Owner: British Columbia Ministry of Transportation and Infrastructure

Engineer: WSP | MMM Group (owner's engineer); Associated Engineering (environmental consulting services and engineering support)

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

Other: Tetra Tech (pavement design and geotech. services); Golder Associates (deep foundation load testing and geotech. investigation); Parsons (traffic planning); LeighFisher (lenders technical advisor)

Funding: Public

The current George Massey Tunnel carries more than 80,000 vehicles per day and is a key component of the regional and provincial transportation system. The replacement project will replace the tunnel with a new long-span bridge and upgrade the adjacent highway corridor.

With a consensus that area residents want a new bridge on the existing Highway 99 corridor, the next step in the project is to prepare a more detailed project scope and business case. All potential financing options are on the table until the scope of the project is confirmed. Subject to environmental review, construction is expected to begin in 2017. Design refinements and consultation are in progress. The estimated date of completion is 2022.

13 Ottawa LRT – Stage 2

\$3 billion 
NEW

Location: Ottawa, Ontario

Owner: City of Ottawa

Engineer: McMillen Jacobs Associates (owner's tunnel eng.); Morrison Hershfield (owner's eng.)

Legal: Borden Ladner Gervais (legal advisor)

Other: Hanscomb (owner's cost consultant and special advisor)

Funding: Public

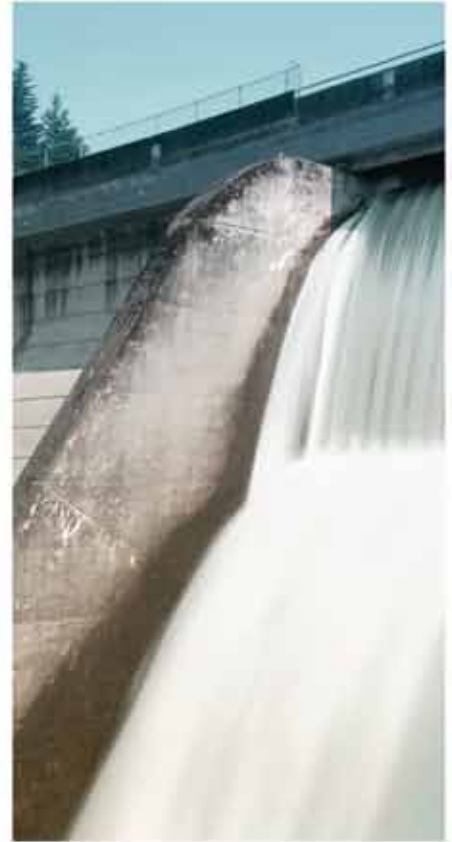
Financing

In July 2015, the federal government announced it would contribute one-third of the cost. The provincial government has also signaled its financial support for the Stage 2 expansion in the 2015 budget under its Moving Ontario Forward infrastructure fund. This tri-level funding arrangement is similar to the partnership for the Confederation Line currently under construction.

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. When completed in 2023, Stage 2 would bring LRT to within five kilometres of almost 70 per cent of residents.

STATS

19 new stations **30** kilometres of rail **70%** of Ottawa residents living within 5 km of rail transit



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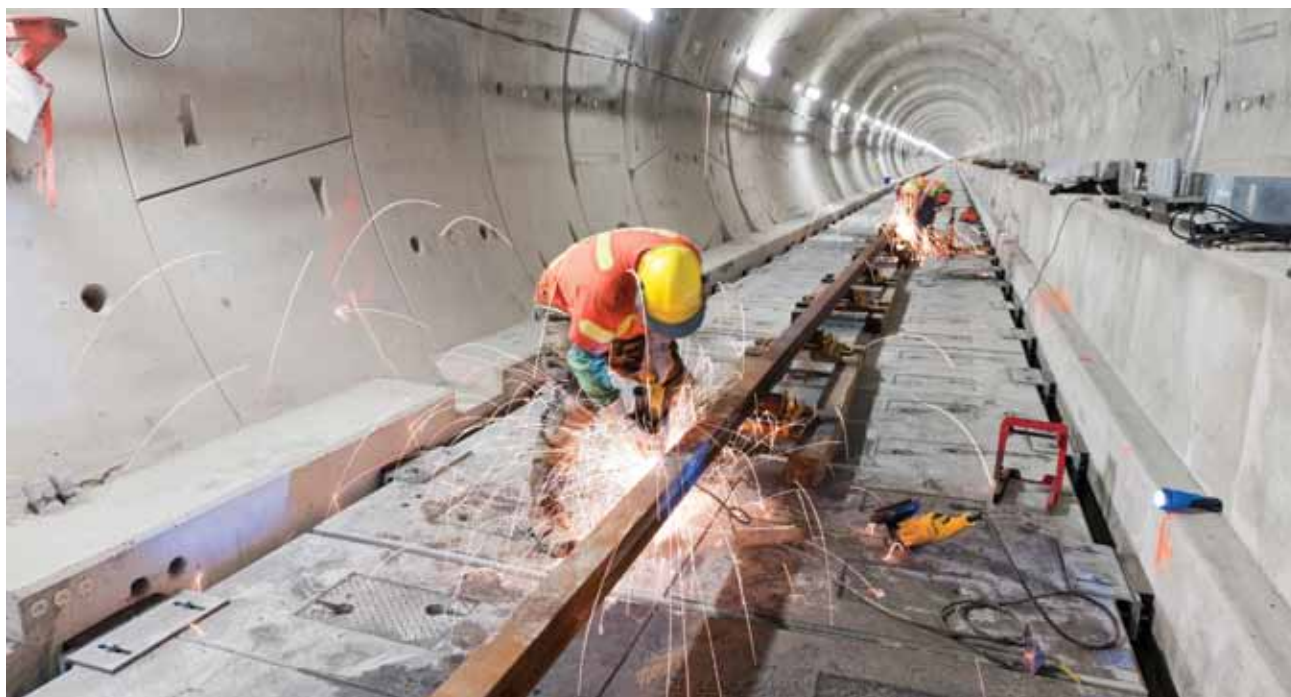
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Credit: © Toronto Transit Commission, 2014

14 Spadina Subway Extension

\$2.78 billion 

2015 Rank: 14

Location: Toronto, Ontario

Owner: TTC

Project/Construction Manager: Spadina Link Project Managers—Hatch (project management and tunnel designer), Parsons, and WSP | MMM Group (project management consultants); Morrison Hershfield (construction management); WSP | Parsons Brinckerhoff (program management); Bechtel Canada (project management oversight)

Engineer: AECOM (engineering design); Golder Associates (principal geo-engineering consultant); HH Angus (mechanical, electrical consultants); Morrison Hershfield (consulting engineer); URS, an AECOM company (EA, route planning, and contract admin as sub to Morrison Hershfield); WSP (structural engineer/sustainability consultant)

Contractor: Walsh Group (Steeles West station construction); Bondfield Construction; EllisDon (York University station); Carillion Construction; Obrascon Huarte Lain and Fomento de Construcciones y Contratas JV (north tunnels and Highway 407 station); Aecon (construction); Dufferin Construction (Agincourt grade separation); McNally International, Kiewit, and Aecon JV (construction of 2.6 km of twin subway tunnels, construction of new Sheppard West station); Varcon Construction (tunnel boring machines launch shaft at Sheppard West station)

Consulting Architect: Aedas (Sheppard West station); Arup Canada in assoc. with Foster + Partners (York University station); JV of IBI Group Architects, LEA Consulting, and WSP | Parsons Brinckerhoff in assoc. with Will Alsop (Finch West and Steeles West stations)

Supplier: Caterpillar; DECAST Ltd. (precast concrete double ties and elastomers); Dufferin Concrete

Legal: WeirFoulds (acting for York Region)

Other: Arup, in assoc. with Grimshaw Architects, Adamson Associates Architects and Foster + Partners (station designs); the Spadina Group Associates, in assoc. with Stevens Group Architects and RMJM (Will Alsop) (Steeles West and Finch West station designs); AECOM in assoc. with Aedas (Sheppard station design); Stantec (project control services); Entro (wayfinding and signage at Finch West and Pioneer Village); Hanscomb (station designers' cost consultant for 6 stations); Aon (insurance broker)

Funding: Public

- **Federal** FLOW program: \$697 million (\$622 million from Building Canada Fund and \$75 million from Public Transit Capital Trust)
- **Provincial** Move Ontario Trust (\$870 million in trust fund, plus interest gathered by the trust): \$1.055 billion
- **Municipal** TTC Capital Program Budget: \$616 million York Region: \$412 million

This addition will provide a critical extension for the existing TTC subway system across the municipal boundary between Toronto and the Regional Municipality of York. This is the largest subway expansion project ever to be undertaken by the TTC since the Bloor-Danforth subway line was built 40 years ago.

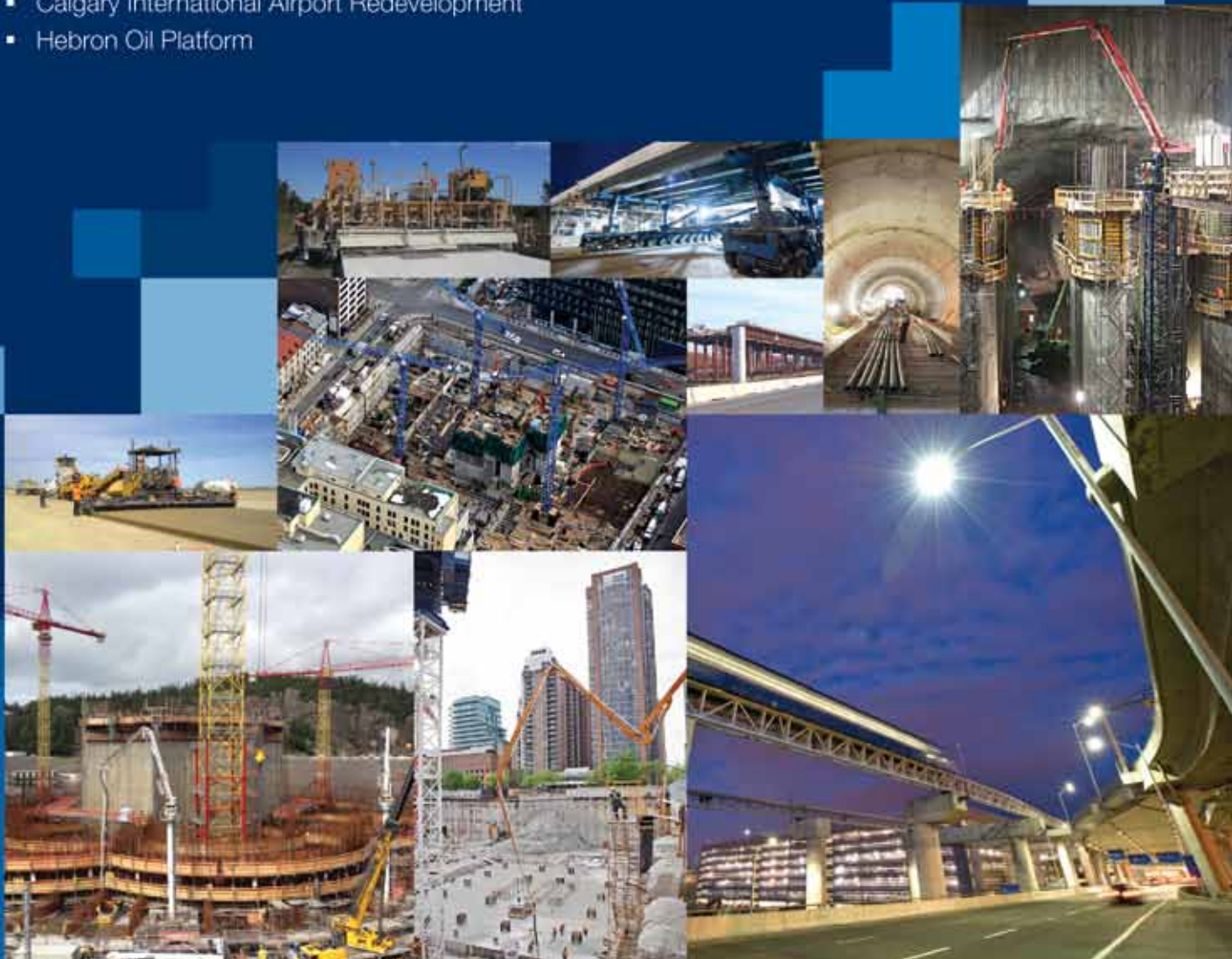
The 8.6-kilometre extension to the existing Spadina line will include six new stations: Sheppard West, Finch West, York University, Pioneer Village at North West Gate and Steeles Avenue, Highway 407, and the Vaughan Metropolitan Centre. The first of four tunnel-boring machines for the extension was launched in June 2011. Construction work on the Highway 407 station is progressing well, with the south tunnel having been completed and construction of the north tunnel soon to commence. Project completion is expected in 2017.



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- Union Pearson Express
- Eglinton Crosstown Light Rail Transit
- Billy Bishop Pedestrian Tunnel
- Romaine Complex Renewable Energy Project
- CHUM (Centre hospitalier de l'Université de Montréal) Redevelopment
- Calgary International Airport Redevelopment
- Hebron Oil Platform



15 Darlington Refurbishment Project – Definition Phase

\$2.7 billion 

2015 Rank: 17

Location: Clarington, Ontario

Owner: Ontario Power Generation (OPG)

Project/Construction Manager: OPG
(general contractor and project manager)

Engineer: SNC-Lavalin; AECOM

Contractor: Aecon and SNC-Lavalin JV
(retube and feeder replacement)

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

Supplier: Dufferin Concrete

Other: GE Energy (formerly Alstom) (equipment supply and technical services contractor); Burns & McDonnell (independent oversight); Golder Associates (provided materials testing, geotechnical, indoor air quality and portable water); Tetra Tech (engineering services agreement as supplier to OPG); Hatch (engineering and construction support)

Funding: Public

The Darlington generating station consists of four reactors with the total output power of 3,512 MW. Refurbishment involves the replacement of core reactor components to enable the plant to operate until 2055. Each reactor is taken out of service for about three years to allow for the replacement of fuel channels, feeder pipes, calandria tubes, and end fittings; rehabilitation of steam generators, turbines, generators, and fuel handling equipment; and system improvements and plant upgrades to meet current regulatory requirements.

More than 450 unique tools have been developed and delivered to undertake the refurbishments. A full scale, non-functioning reactor mock-up was completed in March 2014, and detailed engineering design was completed in August 2015, a year before construction is to start. Starting in 2015, the mock-ups have been used for tool testing and will be used to train the trainers, trades, and management to prepare for execution on the first unit scheduled for refurbishment (Unit 2).

Execution of the first unit will begin in October 2016. The reactors will each be refurbished with planned outage. Unit 2 will be refurbished from 2016 to 2019, Unit 1 will be refurbished from 2019 to 2022, Unit 3 will be refurbished from 2021 to 2024, and Unit 4 will be refurbished from 2022 to 2025.

16 CHUM (Centre hospitalier de l'université de Montréal) Redevelopment

\$2.6 billion 

2015 Rank: 16

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

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

Contractor: EBC Inc.

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

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)

Consulting Engineer: Tetra Tech
(mechanical/electrical engineering)



Credit: CHUM

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

Supplier: Demix Beton (concrete)

Other: BTY Group (lenders technical advisor); Hatch
(independent certifier); Hanscomb (mechanical
and electrical cost consultant and special advisor);
INTECH (insurance advisor); Société québécoise des
infrastructures; SNC-Lavalin and WSP (owner's advisor)

Funding: P3

• **Provincial** \$2.6 billion

A new hospital and research centre will replace the three facilities which currently make up the CHUM—the Hôtel-Dieu de Montréal, Hôpital Notre-Dame, and Hôpital Saint-Luc. Following years of delay, the project received its go-ahead in 2010. The Research Centre will be certified LEED Silver.

It is a significant economic development lever that will include a research centre (which opened fall 2013) and a new teaching hospital complex that will welcome its first patients in spring 2016. (The final of three phases, a medical office tower and conference facility, is scheduled for completion in spring 2020 and not included in the current cost.)

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- Site C Clean Energy Project
- Muskrat Falls Project
- New Champlain Bridge Corridor Project
- Turcot Interchange
- East Rail Maintenance Facility
- Saskatchewan Hospital North Battleford

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*Acritas Global Elite Law Firm Brand Index 2013-2015.

17 F.G. Gardiner Expressway Strategic Rehabilitation Plan

\$2.57 billion 

NEW

Location: Toronto, Ontario

Owner: City of Toronto

Engineer: Morrison Hershfield (baseline study of substructure components)

Other: Ernst & Young, Hanscomb, and HDR (advisory support)

Funding: P3

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



Financing

The total capital cost estimate for the construction portion (excluding operations and maintenance over the 30-year period) is \$2.57 billion (inflated dollars), and the City of Toronto anticipates federal funding to cover \$820 million of those costs. The total contract value (including operations and maintenance) is expected to be approximately \$3.85 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 EA.

Credit: Société de transport de Montréal



18 Montreal Metro Car Replacement

\$2.19 billion 

2015 Rank: 18

Location: Montreal, Quebec

Owner: Société de transport de Montréal (STM)

Engineer: SNC-Lavalin (owner's engineer)

Vehicle Supplier: Bombardier-Alstom

Funding: Public

- **Provincial** Transports Québec: \$1.62 billion
- **Municipal** STM: \$574 million

In August 2015, the STM announced the start of a new phase of qualification testing for AZUR. The tests are to be performed on two AZUR trains that were received in April 2014 and July 2015. The two trains will be operated during the day, mainly on the Orange and Blue lines. Testing without passengers will take place during off-peak hours.

The goal for the first phase of testing is to validate AZUR's overall performance in its actual operating environment (in the tunnels, alongside existing MR-63 and MR-73 trains), while continuing with nighttime testing, which has been ongoing for 15 months throughout the system. Afterwards, the fully-equipped AZUR train will carry out a dry run, in other words perform in "simulated operational" mode, just prior to being put into passenger service. Lastly, the final phase will see actual passenger service begin, expected before the end of 2015, if all required tests are successfully completed.

The STM points out that the Bombardier-Alstom consortium is confident it can still meet the 2018 deadline for delivering all 468 AZUR metro cars.

19 Gordie Howe International Bridge

\$2.14 billion 

2015 Rank: 19

Location: Windsor, Ontario to Detroit, Michigan

Owner: Windsor-Detroit Bridge Authority (WDBA)

Project/Construction Manager: Deloitte

Engineer: Morrison Hershfield (owner's engineer/PDC consultant); Parsons (bridge technical advisor); Davis Langdon, an AECOM company

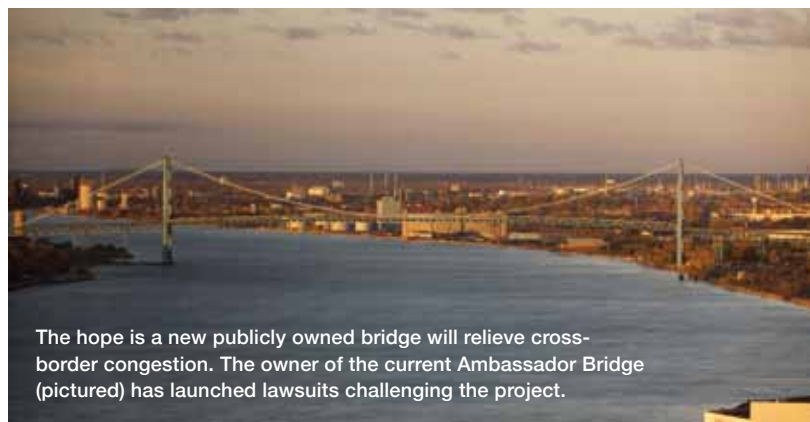
Legal: Fasken Martineau DuMoulin (transaction advisor)

Other: Ernst & Young (advising team); Golder Associates (geotech./foundation engineering); Hanscomb (owner's cost consultant and special advisor); LeighFisher (lenders technical advisor)

Funding: P3

Financing

The international plazas and the bridge will be constructed under a DBFOM framework. Six different North American and international teams responded to the WDBA's RFQ, which was posted in July 2015. The concessionaire will not, however, be responsible for operating and maintaining the I-75 interchange; that responsibility will be retained by Michigan. Construction risk will be assumed by the private sector with the Canadian federal government assuming all risk for traffic and toll revenue.



The hope is a new publicly owned bridge will relieve cross-border congestion. The owner of the current Ambassador Bridge (pictured) has launched lawsuits challenging the project.

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 were announced in July 2014. Since then, the WDBA has issued tenders for advance construction works, such as site preparation for the Canadian plaza and land acquisition on the U.S. side of the border. Estimated date of completion is 2020.

Numbers Breakdown

I-75 Interchange:
\$385.9 million

Normally, Michigan's Department of Transportation would pay for this, but Canada has accepted the cost

U.S. Customs Plaza:
\$413.6 million

Normally, the U.S. General Services Administration would pay for this, but Canada has accepted part of the cost (\$150 million)

Bridge: \$949.1 million

A bond would be sold and paid back with tolls

Canadian Customs Plaza:
\$387.6 million

Canada will pay for its own plaza

Transit Expansion

Top100 involves **264 km of new transit lines** at a cost of **\$150.9 million per km.**



20 Confederation Line

\$2.13 billion 

2015 Rank: 20

Location: Ottawa, Ontario

Owner: City of Ottawa

DBFM Team: Rideau Transit Group—ACS Infrastructure Canada, SNC-Lavalin Capital, EllisDon (developer, design-builder, equity provider); OLRT Constructors, a JV of Dragados Canada, SNC-Lavalin Constructors, and EllisDon (design and construction); Rideau Transit Maintenance General Partnership, composed of subsidiaries of ACS Infrastructure Canada, SNC-Lavalin O&M, and EllisDon (maintenance); WSP | MMM Group; IBI Group; Alstom (vehicles and maintenance services); Thales

Engineer: Capital Transit Partners—Morrison Hershfield, McMillen Jacobs Associates, STV Canada Consulting, and URS, an AECOM company (preliminary engineering); Parsons (functional design); Halcrow Group (tunnel design for EA report); Golder Associates (owner's geotechnical, hydrogeological, archeological, and environmental consultant); Hatch (design of tunnel lining, portals, and approach cuts; design of underground station structures and entrances; design of tunnel mechanical and electrical systems; analysis of underground ventilation system)

Financiers/Banks: National Bank Financial and Sun Life Assurance (co-lead underwriters and agent); BMO Capital Markets (advisor to IO and City of Ottawa)

Legal: DLA Piper (Canada) (counsel to Rideau Transit Group Partnership); Borden Ladner Gervais (counsel to City of Ottawa); Torys (counsel to lenders); Stikeman Elliott (Alstom)

Consulting Architect: Adamson Associates Architects, BBB Architects, and IBI Group (design)

Supplier: Siemens; DECAST Ltd. (precast girders and structures)

Other: Aon (risk/insurance advisor to authority); Delcan (technical advisor); Entro (wayfinding and signage); Hanscomb (owners' engineer's cost consultant); Infrastructure Ontario (procurement advisor); INTECH (insurance advisor); Novus (preliminary studies)

Funding: P3

- **Federal** \$761.5 million (Building Canada Fund: \$600 million; Gas Tax Fund: \$161.5 million)
- **Provincial** \$887 million (Government of Ontario: \$600 million; Provincial Gas Tax: \$287 million)
- **Municipal** \$481.5 million (development charge revenues and transit reserves)

This project is set to meet the City of Ottawa's infrastructure challenge by way of a state-of-the-art LRT system with an initial capacity of 24,000 riders per hour in each direction, including a congestion-solving 2.5 kilometre tunnel that will rapidly move riders across downtown. It will be a fully accessible and convenient system for all users, including cyclists. The 12.5 kilometre rail line will consist of thirteen stations between Tunney's Pasture in the west and Blair Station in the east, with three stations residing in the 2.5 kilometre tunnel downtown. This will make transportation to-and-from the downtown core easier.

Construction is scheduled to be completed in time for system commissioning in summer 2017, with the first revenue service operation planned for May 2018.

21 Calgary International Airport Development Project

\$2 billion 

2015 Rank: 21

Location: Calgary, Alberta

Owner: Calgary Airport Authority

Project/Construction Manager: AECOM and Hatch (project managers on runway development); AECOM (project manager facilities); EllisDon (construction manager, airport facilities); PCL-Parsons-Dufferin JV (construction manager, runway development)

Engineer: Associated Engineering (prime consultants for runway); CH2M (sub to AE); Hatch (civil airside consultant on facilities and engineering design manager on runway development)

Consulting Engineer: Reed Jones Christoffersen (structural); AECOM (electrical/mechanical); Stantec (IT systems)

Architect: DIALOG Design (prime consultant for international facility)

Supplier: Canam (steel joists)

Other: AirBiz (airport planning consultant); LVM (quality assurance); Entro (guest experience strategy, wayfinding, and signage); Engineering Harmonics (sound and digital signage consultant); SNC-Lavalin (operational readiness and transition program); BEEI (QA); IQC (QA); WSP | MMM Group (commissioning and geomatics services); Hanscomb (owner's design and construction stage cost consultant)

Funding: Private

- **Private** Calgary Airport Authority: \$2 billion

The Airport Development Program (ADP) includes two major projects: the Runway Development Project (RDP) and the new International Terminal. The RDP, which includes Canada's longest runway at 14,000 feet, has been completed and the first arriving and departing flights took place on June 28, 2014. The International Facilities Project, which will more than double the size of the existing facility, is still on track to be near construction completion in late 2015. This will be followed by a number of commissioning, activation, and integration activities that will continue through 2016. The new International Terminal is scheduled to open in fall 2016.

New elements to the program will enhance the connections processes at the airport in conjunction with the opening of the new International Terminal in 2016. These elements are focused on passenger connectivity from the existing Air Terminal Building to the new International Terminal. This includes a new secure Connections Corridor, which will allow passengers to connect from concourse to concourse without leaving the secure area. The corridor also includes three transportation options, including foot traffic, use of moving walkways, or the option to take the new Compact Transit System (a small vehicle that can carry up to 10 passengers at a time along the corridor).

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Credit: Ivanhoé Cambridge



22 45-141 Bay Street

\$2 billion



2015 Rank: 22

Location: Toronto, Ontario

Owner: Metrolinx and Ivanhoé Cambridge

Contractor: EllisDon (general contractor)

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

Other: Arup (pedestrian modelling); INTECH (advisor to developers); Morrison Hershfield (building envelope consultant); WSP (sustainability consultant, geotech./env. work)

Funding:

Public/Private

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

Financing

Ivanhoé Cambridge and Metrolinx stress the figures are initial estimates, and the current \$2 billion total is subject to change.

Metrolinx has signed an agreement with real estate investor and developer Ivanhoé Cambridge to develop an integrated transit and office development. A significant piece of this development is a brand new GO Bus Terminal that will be located at the base of Ivanhoé's planned office complex development at 45 Bay Street. The new bus terminal will serve thousands of GO customers and is an integral part of the Union Station Revitalization Project and Union-Pearson Express Spur Line.

Construction is expected to start in spring 2016 on the entire development, and the new GO terminal is expected to take about three years to build.

Credit: Port Metro Vancouver



23 Roberts Bank Terminal 2 Project

\$2 billion



2015 Rank: 23

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)

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

Funding: Private

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

Financing

Port Metro Vancouver is funding the initial planning and EA 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.

Port Metro Vancouver recently submitted an environmental impact statement for the project, which will be reviewed by an independent panel of experts as part of the EA process. Construction is expected to begin in 2017. Subject to environmental approval, the project could be operational by 2023.

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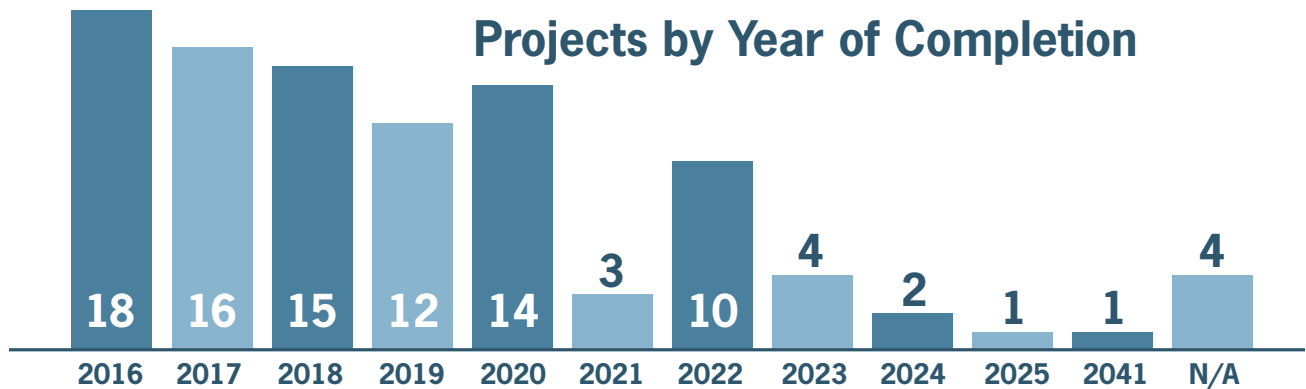
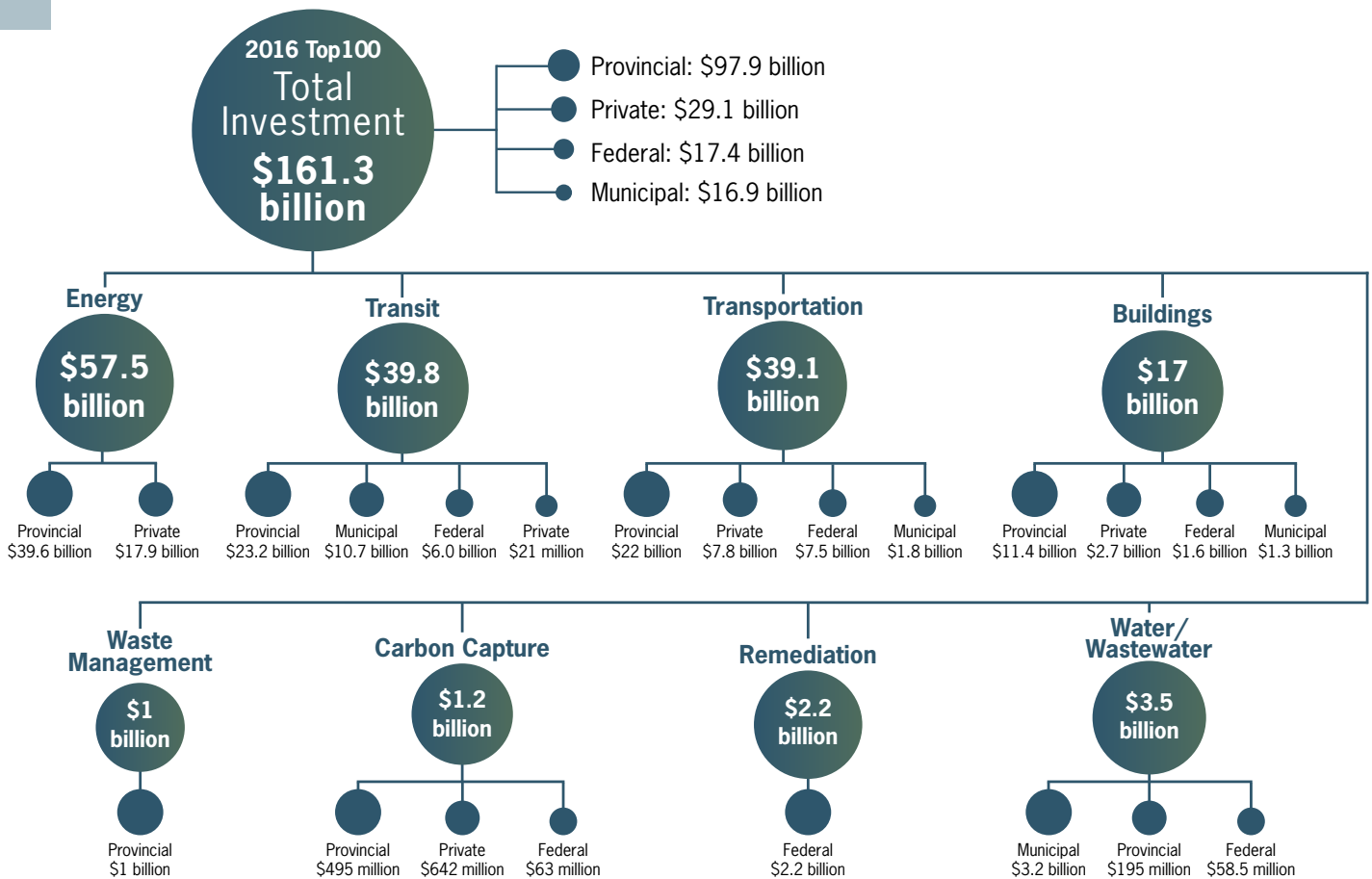
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20 projects or more

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Top100 Projects
GOLD 2016
6 to 9 projects

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3 to 5 projects

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Hydroelectric Project
Up to \$12.94M



Organics Biofuels Facility Project
(Surrey, BC)
Up to \$16.90M



Downtown Eastside Housing
Renewal Project
(Vancouver, BC)
Up to \$29.10M



Lincoln Station Project
(Coquitlam, BC)
Up to \$7.00M



Biosolids Energy Centre
(Greater Victoria, BC)
Up to \$83.40M



Evan Thomas Water and
Wastewater Plant
(Kananaskis Country, AB)
Up to \$9.95M



Stoney CNG Bus
Storage & Transit Facility
(Calgary, AB)
Up to \$48.40M



Edmonton Light Rail
Transit System
Up to \$250.00M



North Saskatchewan Bridge
(Edmonton, AB)
Up to \$36.80M



Biological Nutrient Removal
Wastewater Treatment Facility
(Lac La Biche County, AB)
Up to \$3.80M



Saskatoon Civic
Operations Project
Up to \$42.90M



Parkway and Traffic
Bridge Replacement
(Saskatoon, SK)
Up to \$66.00M



Regina Bypass Project
Up to \$200.00M



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The P3 Canada Fund makes strategic investments in projects that exemplify best practice and grow Canada's market for public-private partnerships (P3s). Between 2009 and 2015, the \$1.2-billion Fund provided up to 25% support to 23 projects, leveraging more than \$6 billion in P3 infrastructure.



Regina Wastewater Treatment Plant

Up to \$58.50M



Chief Peguis Trail Extension
(Winnipeg, MB)

Up to \$25.00M



Winnipeg Capital Integration Project
(Winnipeg, MB)

Up to \$137.3M



Biosolids Management Facility
(Greater Sudbury, ON)

Up to \$11.00M



Barrie Transit Facility Project
(Barrie, ON)

Up to \$5.80M



Hamilton Biosolids Project
(Hamilton, ON)

Up to \$22.91M



GO Transit East Rail Maintenance Facility
(Whitby, ON)

Up to \$94.80M



Lachine Train Maintenance Centre
(Montreal, QC)

Up to \$25.00M



Saint John Safe Clean Drinking Water
(Saint John, NB)

Up to \$57.30M



Iqaluit International Airport
(Iqaluit, NU)

Up to \$77.30M

TREND SPOTTING

- Since the launch of the Fund, the number of P3s entering procurement has more than doubled.
- The estimated incremental value of these projects compared to traditional procurement exceeds \$800 million.
- 63% of projects supported to date employ the design-build-finance-operate-maintain (DBFOM) model.

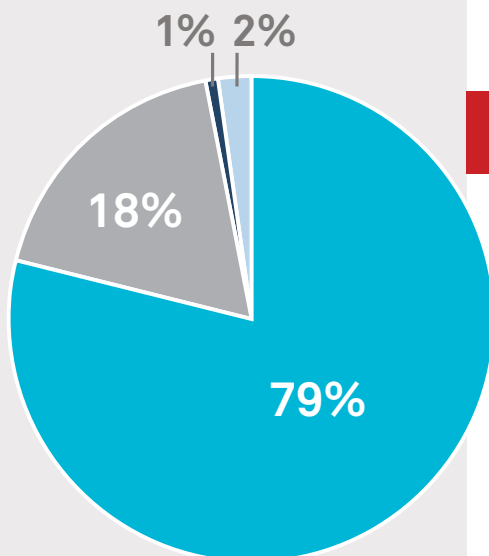
New entrants

- The Fund has committed funding to 14 municipal P3s in 12 municipalities – 11 of these municipalities were first-time entrants into the P3 market.
- Almost 60% of the first \$1.2 billion has been committed to municipal projects.

Expansion into new infrastructure sectors

- The entry of municipalities into the P3 market has created demand for a wider range of assets, including water and wastewater treatment facilities, public transit projects, and solid waste management assets.

FUND ALLOCATION BY SECTOR



- Transportation
- Water/Wastewater
- Solid Waste Management
- Other

24 Regina Bypass Project

\$1.88 billion 

2015 Rank: 52

Location: Regina, Saskatchewan

Owner: Saskatchewan Ministry of Highways and Infrastructure

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

Engineer: Associated Engineering (owner's engineer team); Graham Group (design builder lead); 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)

Other: Aon (risk/insurance advisor to authority); Ernst & Young (financial and procurement advisor); Golder Associates; INTECH (insurance advisor); LeighFisher (ind. certifier)

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.

Construction began in summer 2015 and will be complete in fall 2019, with some segments opening in advance of the full bypass completion.

25 Northeast Anthony Henday Drive

\$1.81 billion 

2015 Rank: 24

Location: Edmonton, Alberta

Owner: Alberta Transportation

DBFM Team: Capital City Link General Partnership—subsidiaries of Meridiam, ACS Infrastructure Canada, and HOCHTIEF (equity); Flatiron, Dragados Canada, Aecon, and Lafarge Canada JV (design and construction); Volker Stevin Highways (operations and maintenance)

Engineer: AECOM (lead); WSP | MMM Group (segment 4); ISL Engineering and Land Services; GNEC/CTMS; Stantec; Amec Foster Wheeler; EBA; COWI North America (North Saskatchewan River crossing)

Financiers/Banks: ACS Infrastructure Canada; CIBC World Markets and National Bank Financial (joint lead underwriters)

Legal: Gowling Lafleur Henderson LLP (corporate counsel to ACS)

Supplier: AIL Construction Management; Canam Group; High Pine; Jatec-Nova Pole; Lafarge

Other: BTY Group (lenders' technical advisor); DLA Piper (Canada) (counsel to proponent); Ernst & Young (advising team); INTECH (insurance advisor); Tetra Tech (pavement design and geotech. services)

Funding: P3

- **Federal** P3 Canada Fund: up to \$36.8 million
- **Provincial** \$1.77 billion



Credit: Capital City Link Group

This project includes 18 kilometres of reconstructed six- and eight-lane divided freeway, nine kilometres of new six- and eight-lane divided freeway, nine service interchanges, seven grade separations, and twin river bridge structures. The 27-kilometre northeast leg of the ring road will be free-flow (there will be no traffic lights on the freeway).

One of the major project highlights is construction of twin bridges, which will stretch almost one-third of a kilometre over the North Saskatchewan River. Three lanes of northbound traffic and four lanes of southbound traffic will open to the public in 2016 and the design includes the capability for future widening of up to two additional lanes in each direction if warranted. The southbound bridge will include a pedestrian and bicycle bridge suspended below the structure to connect to surrounding existing and future trail networks.

The construction of 17 bridges is complete, with traffic resuming on several of them. Construction commenced in June 2012, with completion scheduled for October 2016.



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Credit: City of Edmonton

26 Edmonton Valley Line – Stage 1

\$1.8 billion 

2015 Rank: 25

Location: Edmonton, Alberta

Owner: City of Edmonton

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

Engineer: Connected Transit Partnership—AECOM, Hatch, DIALOG, ISL Engineering and Land Services, GEC Architecture; Associated Engineering (support)

Legal: Borden Ladner Gervais (legal advisor), McCarthy Tétrault

Other: Aon (risk/insurance advisor to owner); BTY Group (cost consultant); Ernst & Young (advising team); LeighFisher (equity O&M advisor); Morrison Hershfield (transit O&M consultant)

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 which 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 neighborhoods.

The southeast section from Mill Woods to 102 Street (Stage 1) will be the first section to be built, with future extensions eventually taking the line out west to Lewis Farms. The southeast section of the line will be constructed first, due to a required operations and maintenance facility that will be located near Whitemud Drive. The RFP was issued in fall 2014, and a preferred proponent was expected to be announced by the end of 2015, with construction expected to start in 2016. Completion is scheduled for 2020. Looking ahead, Stage 2 will continue west to Lewis Farms at an additional \$1.4 billion.

27 Vancouver International Airport Upgrades

\$1.8 billion 

2015 Rank: 26

Location: Vancouver, British Columbia

Owner: Vancouver Airport Authority

Project/Construction Manager: Vancouver Airport Authority

Engineer: Stantec; WSP | MMM Group; SNC-Lavalin

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

Legal: McCarthy Tétrault (represented VIAA)

Supplier: Canam Group (joists and steel deck)

Other: BMO Capital Markets (bonds issue); BTY Group (cost consultant); Entro (wayfinding and signage); WSP (materials engineering, quality management)

Funding: Private

- **Private** Vancouver Airport Authority: \$1.8 billion (collected through an increased Airport Improvement Fee)

These airport upgrades are part of a 10-year strategy to improve and expand its facilities to accommodate projected increases in travellers and attract new routes and carriers. Included are some 700 metres of additional secure corridors, high-speed baggage systems, upgrades to the original 1968 Domestic Terminal Building, runway safety enhancements, and upgrades to airport roads, bridges, and dykes. In order to help finance the upgrades, a \$5 increase in the Airport Improvement Fee will be added for passengers departing to destinations outside of British Columbia or the Yukon. Construction on the Domestic Terminal's A and B Piers is underway, and completion of the upgrades is estimated for 2022.

28 Renovations to Beauharnois Generating Station

\$1.6 billion 

2015 Rank: 29

Location: Beauharnois, Quebec

Owner: Hydro-Québec

Project/Construction Management: Hydro-Québec Équipement

Engineer: Dessau, SNC-Lavalin, CIMA +

Contractor: HMI Construction Inc.

Turbine Supplier:

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

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.



29 Hurontario LRT

\$1.6 billion 

2015 Rank: 30

Location: Mississauga and Brampton, Ontario

Owner: Metrolinx

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

Other: DIALOG (urban design); Dufferin Construction; Golder Associates (preliminary geotechnical services); Hanscomb (preliminary design engineer's cost consultant); Hatch; LEA Group (ITS)

Funding: Public

This 23-kilometre project was designed to operate along Hurontario Street from Port Credit GO Station in Mississauga, around Mississauga's City Centre area, and north on Hurontario Street to Brampton's downtown Main Street to the Brampton GO Station. A maintenance and storage facility, located at Hurontario and Highway 407, is also proposed as part of the project.

In October 2015, Brampton City Council voted to restrict the alignment to terminate at Gateway Terminal at Steeles Avenue. Metrolinx is, therefore, revising the scope of the project so that the northern terminus is at Steeles Avenue. Only 5.6 kilometres of the route would have been in Brampton, while Mississauga has 17.6 kilometres (and has approved their portion of the project). In response to the decision, Metrolinx CEO Bruce McCuaig said the provincial money that had been available for the Brampton portion of the line will now be available for other transit projects. However, he also made it clear that any alternative transit plan could still be considered for funding.

Metrolinx is moving to retain an owner's engineer and technical advisor to help move the project forward, and will work to begin construction in 2018 and begin service by the end of 2022.

30 Maritime Link Project

\$1.577 billion 

2015 Rank: 32

Location: Granite Canal to Bottom Brook to Cape Ray, Newfoundland and Labrador to Cape Breton, Nova Scotia

Owner: ENL Maritime Link (NSP Maritime Link Inc.)

Engineer: ENL's project management team; Hatch (engineering services); Stantec; Amec Foster Wheeler; Altus Group; Servant, Dunbrack, McKenzie & MacDonald; SNC-Lavalin (3 substations/2 transition stations)

Contractor: Abengoa S.A.

Legal: McCarthy Tétrault (underwriter for Maritime Link Financing Trust)

Other: ABB; Aon (risk/insurance advisor to authority); Maclean Forestry (clearing in N.S.); Major's Logging (clearing in N.L.); Nexans (subsea cable contract)

Funding: Private

This project involves the design, engineering, construction, operations, and maintenance of a new 500-MW transmission system between Granite Canal, Newfoundland and Labrador and Woodbine, Nova Scotia. The link will also include two 170-kilometre subsea cables across the Cabot Strait, close to 50 kilometres of overland transmission in Nova Scotia, and nearly 300 kilometres of overland transmission on the island of Newfoundland.

The project continues to be on budget and on schedule. Transmission right-of-way clearing began early in 2014 and is ongoing. Labour agreements have been finalized, and construction is expected to be complete in 2017.

Credit: Public consultation via Tr-mississauga.brampton.ca

31 Great Spirit Power Project

\$1.5 billion

2015 Rank: 34

Location: Lake Wabamun, Alberta

Owner: Focus Energy Group and Paul First Nation

Project/Construction Manager: Focus Energy Group

Other: Paul First Nation (host and equity owner); New West Opportunities (First Nations advisors); CF Power (interconnection engineers); WSP (quality management)

Funding: Private

Financing

Focus Energy Group and partners will provide equity and debt financing.

This proposed 930 MW power project is to be a combined cycle natural-gas fired power plant. The facility will be located on Paul First Nation Industrial Park, and ownership will be shared with that Nation. The Paul First Nation has agreed to develop the project along with Focus Equities Inc. which will replace nearby aging coal plants as well as provide economic development opportunities for the community. Construction of the facility is to be completed in early 2018.



Credit: B.C. Ministry of Transportation and Infrastructure

32 Evergreen Rapid Transit Line

\$1.431 billion

2015 Rank: 35

Location: Metro Vancouver, British Columbia

Owner: BC Ministry of Transportation and Infrastructure

DBF Team: EGRT Construction—SNC-Lavalin, Graham, International Bridge Technologies, McMillen Jacobs Associates, Rizzani de Eccher, SELI Canada, SNC-Lavalin Constructors, WSP | MMM Group (engineer and technical director)

Engineer: Associated Engineering (engineering services/support); CH2M; Golder Associates; Hatch; MEG Consulting; Parsons

Financiers/Banks: National Bank Financial (financial advisor, bank lead underwriter, and agent)

Legal: DLA Piper (Canada) (advised SNC-Lavalin and EGRT); Gowling Lafleur Henderson (counsel to SELI); McCarthy Tétrault (advised lenders to EGRT)

Consulting Architect: Perkins + Will; Francl Architecture; DIALOG (sub-consultant to SNC-Lavalin)

Tunnel Boring Machine Supplier: Caterpillar

Vehicle Supplier: Bombardier

Supplier: Bombardier (vehicles); Partnerships BC; Thalys (automatic train control); Canam Group

Other: INTECH (insurance advisor); LeighFisher (lenders' technical advisor); Partnerships BC (procurement partner and project implementation); Tetra Tech (geotechnical services); WSP (quality management)

Funding: P3

- **Federal** \$424 million (Building Canada Fund: \$350 million; Public Transit Capital Trust Fund: \$67 million; P3 Canada Fund: \$7 million)
- **Provincial** \$586 million
- **Municipal** TransLink: \$400 million (regional funding)
- **Private** Other partners: \$21 million

The Evergreen Line Rapid Transit Project is an 11-kilometre, seven-station, automated rapid transit line that connects Port Moody and Douglas College in Coquitlam with existing SkyTrain service at Lougheed Town Centre station in Burnaby.

The project includes elevated and at-grade guideways, a two-kilometre bored tunnel, seven stations, five power substations, train operating systems, parking facilities, and a vehicle storage and light maintenance facility. The alignment navigates existing roadways, CPR tracks, and water crossings, with an incline ranging from one to six per cent through challenging ground conditions.

Elevated and at-grade guideway construction is complete. Test trains have begun running along the North Road corridor between Lougheed Town Centre Station and Burquitlam Station in July 2015. The project will be fully integrated with the existing SkyTrain system with completion scheduled for 2016.

33 Fort McMurray West Transmission Project

\$1.43 billion



2015 Rank: 31

Location: Edmonton to Fort McMurray, Alberta

Owner: Alberta Electric System Operator

DBFOM Team: Alberta PowerLine—Quanta Services (subsidiary Valard to provide EPC services) and ATCO Electric (route planning, O&M)

Legal: Bennett Jones (acted for successful proponent); Norton Rose Fulbright

Other: Aon (risk/insurance advisor to authority)

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-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. If approved, construction of the line is scheduled to start in 2017 and be in service in 2019.

34 Chamouchouane–Bout-de-l'Île Transmission Line

\$1.4 billion



2015 Rank: 39

Location: Saguenay to Montreal, Quebec

Owner: Hydro-Québec

Environmental Services: WSP (environmental impact study)

Funding: Public

This project includes building a new 735 kV, 406-kilometre transmission line to increase its capacity to bring power from the north to the south. In the Lac-Saint-Jean region, four transmission lines bring power to the Chamouchouane and Saguenay substations from the north (from Baie-James on one side, and Côte-Nord on the other), while only three run southwards. This creates a funnel effect and limits the system's capacity to bring power to the south, where the major load centres are located.

To reduce pressure on the system and mitigate this funnel effect, reinforcement between the Chamouchouane substation and the Montreal metropolitan loop is necessary. Construction began in 2015, with a completion date expected around September 2018.

35 Genesee 4 & 5 Generation Stations

\$1.4 billion



NEW

Location: West of Edmonton, Alberta

Owner: Enmax and Capital Power Corp.

Project/Construction Manager: Capital Power

Turbine Supplier: Mitsubishi Hitachi Power Systems

Funding: Private

• **Private:** \$1.4 billion

This proposed combined cycle natural gas-fired generation facility will be located on a brownfield site within the boundaries of Capital Power's existing Genesee Generating Station. The project will utilize the latest high-efficiency turbine technology and will have a generation capacity of approximately 1,060 MW consisting of two 530-MW units. The facility consists of two one-on-one, single shaft power islands, each incorporating a 501 J-class natural gas turbine, steam turbine, generator, and heat recovery steam generator.

All major regulatory approvals have been granted from the Alberta Utilities Commission and Alberta Environment and Sustainable Resource Development to proceed with construction. Construction is expected to start in 2016. Construction of the first phase is expected to take three years, with the second phase taking an additional year to complete. Completion of the first unit in 2019 will coincide with the need for additional generation to meet growing demand and to replace generation from the retirement of some existing coal generating units in Alberta.

Energy Development in Canada

Total investment in Energy: **\$57.5 billion**

\$35.2 billion

11 projects



Hydroelectric
9,605 MW

\$4.8 billion

4 projects



Natural Gas
2,596 MW

\$2.7 billion

1 project



Nuclear
3,512 MW

\$1.9 billion

3 projects



Wind
704 MW

Generation

- \$44.6 billion
- 19 projects
- 16,417 MW

Transmission

- \$12.9 billion
- 8 projects
- 5,610 km of power lines

36 York VIVA Bus Rapid Transit (vivaNext)

\$1.4 billion 

2015 Rank: 37

Location: York Region, Ontario

Owner: York Region Rapid Transit Corp. and Metrolinx

Project/Construction Manager: Kiewit EllisDon (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)

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

Engineer: AECOM; Parsons; McCormick Rankin; WSP | MMM Group (engineer and program manager); URS, an AECOM company; Ecoplan; IBI Group (design engineer)

Environmental Services: WSP

Legal: McCarthy Tétrault

Vehicle Supplier: NovaBus

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

Other: Aon (risk/insurance advisor to authority); BTY Group (ind. certifier); Entro; Golder Associates (ground engineering services); Revay and Associates; Morrison Hershfield (prime design consultants); Infrastructure Ontario (procurement advisor); LeighFisher (ind. quality certifier); Hanscomb (owners' engineer's cost consultant); INTECH (insurance advisor)



Credit: Parsons

Funding: Public

- **Federal** \$85 million
- **Provincial** Capital allotment to Metrolinx, the regional transportation authority: \$1.23 billion
- **Municipal** \$85 million

Once completed, vivaNext Rapidways will be more than 35 km 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 David Drive in Newmarket. Construction is ongoing.

37 Wataynikaneyap Transmission Project

\$1.35 billion 

NEW

Location: Northern, Ontario

Owner: Wataynikaneyap Power in partnership with FortisOntario and RES Canada

Environmental Services: Golder Associates (Phase 1 EA)

Other: AECOM (lead), PowerTel, and Deutsche Bank (MOU for design, construction, and financial services); PricewaterhouseCoopers (financial feasibility study and socioeconomic impact analysis); Torys (regulatory overview); SENES Consultants (Phase 2 routing study)

Funding: Public/Private

Financing

Wataynikaneyap has invested approximately \$16 million to date on pre-development activities. Government funding is still required to make the project a reality.

Wataynikaneyap Power—composed of 20 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 a 1,800-kilometre transmission line broken into two phases: a 300-kilometre line to Pickle Lake (\$200 million), and transmission lines to connect the communities north of Pickle Lake and Red Lake (\$1.15 billion). Construction is planned to start in early 2018. Potential remote electrification is anticipated in 2022, with build-out to 2024.

38 Romaine Complex Transmission Line

\$1.3 billion 

2015 Rank: 45

Location: Minganie Region, Quebec

Owner: Hydro-Québec

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

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

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. Draft-design studies and applications for authorization have been carried out for the generating stations and now Hydro-Québec TransÉnergie is studying the structures required for integration into the power system. 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, and construction has been underway since summer 2011.



Credit: Hydro-Québec

39 Port Hope Area Initiative

\$1.28 billion 

2015 Rank: 42

Location: Port Hope and Clarington, Ontario

Owner: Natural Resources Canada and Atomic Energy Canada Limited

Project/Construction Manager:

WSP | MMM Group (project management, engineer, EPC management)

Engineer: AECOM (Port Granby project)

Contractor: Maple Reinders (Port Grandby); Amec Foster Wheeler and CB&I JV (major contractor, Port Grandby); ARCADIS Canada (Port Hope property radiological survey)

Environmental Services: AECOM; Golder Associates (contamination investigation/remediation; Phase I ESA; geotechnical)

Financiers/Banks: Natural Resources Canada

Other: Tetra Tech (working for Cameco, completed feasibility study on the Vision in Motion project, part of PHAI); Hanscomb (owner's preliminary design stage cost consultant and special advisor)

Funding: Public

• **Federal** Natural Resources Canada: \$1.28 billion

This is a long-term federal environmental initiative to clean up and manage approximately 1.7 million cubic metres of historic low-level radioactive waste (LLRW) in the municipalities of Port Hope and Clarington in Ontario. A 2001 legal agreement between the Government of Canada and the two municipalities mandated the initiative. The initiative includes two distinct projects: the Port Hope Project and Port Granby Project.

The Port Hope Project will clean up approximately 1.2 million cubic metres of historic LLRW in the municipality of Port Hope. Project-related activities will occur at various locations throughout the municipality and will include remediation of large-scale sites as well as small-scale site cleanups. An existing, closed, low-level radioactive waste management facility in the municipality will be used for long-term storage. Waste at the existing site and from the other large and small-scale sites in the community will be excavated and placed in a new engineered above-ground mound. Construction of a \$25.5-million wastewater treatment plant at the new site was completed in late 2014. The Property Radiological Survey is underway, testing approximately 5,000 properties for the presence of historic LLRW. Remediation of sites will begin once the long-term waste management facility is ready to receive waste, anticipated in 2017.

The Port Granby Project will clean up approximately 450,000 cubic metres of historic LLRW located at an existing waste management facility on the shoreline of Lake Ontario in Clarington. The waste will be relocated to a new long-term waste management facility to be built about a kilometre north of the current site.

A temporary underpass below Lakeshore Road will connect existing and new sites during construction. Waste excavated at the existing facility will travel through the underpass along a dedicated access road to the new long-term waste management facility, so that trucks carrying waste avoid all public roadways. The cleanup is expected to begin in 2016.

40 Highway 63 Twinning Program

\$1.22 billion 

2015 Rank: 43

Location: Grassland to Fort McMurray, Alberta

Owner: Alberta Transportation

Engineer: AECOM; Amec Foster Wheeler; ARA Engineering Ltd.; Associated Engineering (design engineer); CH2M (Athabasca River Bridge); EBA, a Tetra Tech company; Stantec; Stewart Weir & Co.; Thurber Engineering; WSP

Contractor: Carmacks Enterprises; CastleGlenn Consultants; Command Equipment; Flatiron Constructors; Formula Alberta; Graham; Innovative Civil Constructors; Prairie North Const. Ltd.; Prairie Roadbuilders; Sigfusson Northern; South Rock Construction; Thompson Bros.; Weinrich Contracting

Funding: Public

• **Provincial** \$1.22 billion



Credit: Alberta Transportation

The twinning of 240 kilometres of Highway 63 between Grassland and Fort McMurray is for the safety of motorists and to improve traffic flow within Fort McMurray. The project is expected to be completed by fall 2016.

There are dozens of contractors and consultants working on road segments, bridges, and interchange contracts with this project, so this entry is merely scratching the surface. Visit bit.ly/63twinning for a full breakdown of contracts.

41 Alberta Carbon Trunk Line

\$1.2 billion 

2015 Rank: 44

Location: Fort Saskatchewan to Clive, Alberta

Owner: Enhance Energy Inc.

Project/Construction Manager: SAW Engineering (EPC management)

Engineer: Caber Engineering, a Tetra Tech Company (engineering design); SAW Engineering

Supplier: Siemens

Other: NorthWest Refinery; Agrium Inc.; LeighFisher (lenders technical advisor); WSP (geomatics services)

Funding: Public/Private

• **Federal** \$63.2 million

• **Provincial** CCS Fund: \$495 million

• **Private** \$641.8 million

This 240-kilometre pipeline will collect CO₂ 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 CO₂ 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. It will lay the groundwork for a cost-effective, industry-wide solution to the management of CO₂ emissions from Alberta's upgrading, refining, power generation, and petrochemical operations.

Enhance Energy received regulatory approval to build the pipeline and acquired 100 per cent of its right of way. Procurement is underway, with 70 per cent of all goods and services being accessed in Alberta. It is estimated to be completed in 2016.

A Decade of Top100

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



42 Finch West LRT

\$1.2 billion



2015 Rank: 50

Location: Toronto, Ontario

Owner: Metrolinx

Project Manager: Parsons

Engineer: CH2M (owner's engineer and project manager); WSP | Parsons Brinkerhoff (engineer/sustainability consultant); Hatch (owner's engineer)

Vehicle Supplier: Bombardier

Supplier: Dufferin Concrete

Other: AECOM (technical advisor); Aon (risk/insurance advisor to authority); Ernst & Young (advising gvt.); Infrastructure Ontario (managing procurement/construction); LeighFisher (lenders technical advisor); WSP (geotechnical consultant)

Funding: Public

• **Provincial** Ministry of Transportation capital allotment to Metrolinx: \$1.2 billion

The Finch West LRT will create 11 new kilometres of light rail transit line that will run along the surface of Toronto's Finch Avenue from the planned Finch West Subway Station at Keele Street to Humber College. The line will operate in a dedicated lane in the centre of the street, serving 2,700 people per hour in the peak direction by 2031. Primary design and engineering work is currently underway.

43 New TTC Light-Rail Vehicles

\$1.187 billion



NEW

Location: Toronto, Ontario

Owner: TTC

Vehicle Supplier: Bombardier

Other: WSP | Parson Brinkerhoff (consulting on the manufacture and procurement, commissioning, hazard and safety control phases of new vehicle projects)

Funding: Public

• **Provincial** \$416 million
• **Municipal** TTC: \$771 million

The provincial government has allocated up to \$416 million, or one-third of the funding of eligible costs related to the purchase of 204 light-rail vehicles, to replace the current streetcar fleet. The program is active and is slated to run from 2009 to 2019, when the last vehicle is delivered. After 2019, the TTC plans for the purchase of an additional 60 light-rail vehicles to accommodate ridership growth for \$366 million.

44 Highway 407 East Extension – Phase 2

\$1.158 billion

NEW



Location: Oshawa to Clarington, Ontario

Owner: Ontario Ministry of Transportation

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: Coffey
Geotechnics;
Parsons

Other: Aon (risk/insurance advisor to authority); CH2M (technical advisors for procurement and implementation); Ernst & Young (advising gvt.); Infrastructure Ontario (procurement manager and project development); LeighFisher (lenders technical advisor)

Funding: P3
• **Provincial** \$1.158 billion



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 from Harmony Road to Highway 35/115 in Clarington and include the East Durham Link (EDL). This phase will be built in two stages: Harmony Road to EDL by 2017, and EDL to Highway 35/115 including the EDL by 2020.

45 East Side Transportation Initiative

\$1.125 billion 

2015 Rank: 46

Location: Eastern Manitoba, Manitoba

Owner: Province of Manitoba

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

Environmental Services: Tetra Tech

Financing

The full budget is \$3 billion, but the East Side Road Authority said only \$1.125 billion has been committed to by the provincial government so far. Discussions are underway with the federal government regarding involvement in the project. If the feds come to the table and match provincial government contributions, the project's 30-year timeline could be reduced.

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

Funding: Public
• **Provincial** \$1.125 billion

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 km in length costing \$3 billion.

The first step in the project is building the 156-kilometre road that runs from PR304 to Berens River—a massive undertaking consisting of 23 individual road segments and nine bridges. To date, 50 kilometres of all-season road up to Berens River First Nation has been constructed, including four permanent bridges. In addition to that, 92 kilometres of additional right-of-way clearing has been done toward Berens River First Nation, and 233 kilometres of exploratory clearing has been completed and three bridges have been installed, which are dramatically extending the winter road network in the Island Lake area of Manitoba's north.

46 John Hart Generating Station Replacement Project

\$1.093 billion 

2015 Rank: 47

Location: Campbell River, British Columbia

Owner: BC Hydro

DB Team: InPower BC General Partnership—SNC-Lavalin; Aecon

Environmental Services: Hatfield; SNC-Lavalin

Financiers/Banks: SNC-Lavalin Capital Inc.; Scotiabank Global Banking and Markets (underwriter); National Bank Financial (co-lead underwriter)

Legal: Blake, Cassels & Graydon (SNC-Lavalin Capital Inc.); Borden Ladner Gervais (counsel to BC Hydro); McMillan (underwriters and construction lender)

Other: BTY Group (cost consultant); Ernst & Young (advising gvt.); Frontier-Kemper; GE Energy (formerly Alstom); Golder Associates; Mott MacDonald (lenders' technical advisor); INTECH (insurance advisor)

Funding: P3

Financing

BC Hydro will provide 60 per cent of the approximately \$700 million construction capital cost, with InPower BC General Partnership providing the remaining 40 per cent. BC Hydro will then repay the 40 per cent to InPower BC (a consortium led by SNC-Lavalin) over a 15-year operating period based on performance.



Credit: BC Hydro

This generating station project includes the replacement of three 1.8-kilometre penstocks with a 2.1-kilometre tunnel through bedrock; construction of a replacement generation station upstream of the existing station; replacement of the water intake at the John Hart Spillway Dam; and the construction of a new water bypass facility within the new generating station. The current station has been providing energy to the B.C. grid for more than 67 years, and this project aims to improve safety features to protect it against seismic activity, continue to provide reliable hydroelectric power, and protect downstream fish habitat from water flow disruptions.

First Nations have signed project impact benefit agreements with BC Hydro. In February 2014, BC Hydro announced that InPower BC was awarded the contract to design and build the project, the cost of which remains well within the range initially submitted to the British Columbia Utilities Commission. Construction began in summer 2014 and is expected to be completed by 2019.

47 Highway 407 East Extension – Phase 1

\$1 billion 

2015 Rank: 48

Location: Pickering to Oshawa, Ontario

Owner: Ontario Ministry of Transportation

DBFM Team: 407 East Development Group—Concessionaires Cintra and SNC-Lavalin

Design-Build Team: 407 East Construction General Partnership—SNC-Lavalin and Ferrovial Agroman; Jansen & Spaans Engineering and AIA Engineers (design); Bot Construction (subcontractor)

Program Manager: CH2M (to IO)

Engineer: Parsons (owner's engineer)

Financiers/Banks: BMO Capital Markets and Desjardins (financing, bond underwriting, and lenders); CIBC World Markets (capital markets advisor to Infrastructure Ontario)

Legal: McCarthy Tétrault

Supplier: DECAST Ltd. (precast box culvert and girders); Dufferin Concrete and Dufferin Aggregates; Canam Group

Other: Morrison Hershfield and URS, an AECOM company (technical advisors to IO); AECOM (prime consultant); Infrastructure Ontario (procurement manager and project development); LVM (pavement and quality assurance); Golder Associates (testing, inspection and laboratory quality assurance); WSP (pile drive monitoring); LeighFisher (lenders' technical advisor); Aecon; Aon (risk/insurance advisor to authority)

Funding: P3

• **Provincial**
\$1 billion
(\$1.6 billion when adjustments are made for anticipated inflation)

This first phase extends Highway 407 20.3 kilometres east from Brock Road in Pickering to Harmony Road in Oshawa. Six interchanges will allow for on/off access to the extension from local north/south roads. This phase will also connect Highway 407 East to Highway 401 with the West Durham Link, a 10-kilometre, four-lane divided highway to be built east of Lake Ridge Road in Whitby; and require a five-kilometre realignment of Highway 401 to accommodate the West Durham Line.

There will be six lanes on Highway 407 East from Brock Road to the West Durham Link; four lanes from West Durham Link to Harmony Road, and four lanes on West Durham Link. In total, there will be approximately 148 new lane kilometres with up to 11 interchanges including two highway-to-highway interchanges, 31 major water-crossing structures, and 16 road crossings. Phase 1 is currently under construction and is expected to be open to traffic in spring 2016.

48 Henvey Inlet Wind Project

\$1 billion 

NEW

Location: Between Sudbury and Parry Sound, Ontario

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

Environmental Services: AECOM (EA reports)

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. Pattern expects to arrange both construction and long-term debt financing for Henvey Inlet in 2016.

The project is anticipated to start construction in May 2016, with operations commencing in 2018. Upon completion, it will be the largest First Nation wind project in Ontario.

49 Deep Geological Repository

\$1 billion 

2015 Rank: 49

Location: Kincardine, Ontario

Owner: Ontario Power Generation

Project Manager:
Nuclear Waste
Management Organization

Other: AECOM (env. consulting); Geofirma Engineering (geoscientific characterization); G.L. Tiley & Associates; Golder Associates (env. impact statement); Tetra Tech; WorleyParsons

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 underground 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. The federal environment minister is expected to make a final decision in late 2015.



Credit: Ontario Power Generation

50 The Milner Energy Centre

\$1 billion 

2015 Rank: 33

Location: Grande Cache, Alberta

Owner: Maxim Power

Funding: Private

In June 2014, the Alberta Utilities Commission (AUC) approved Maxim's application to construct and operate a 520-MW natural gas-fired expansion (M2) at the site of the existing 150-MW Milner generating facility (M1). The expansion will be located adjacent to M1 and will take advantage of the existing infrastructure at the site, allowing Maxim to leverage benefits including electrical connection, fuel delivery, water licenses, and a skilled operations team. Natural gas will be supplied via an expansion of the existing natural gas pipeline that currently supplies M1. In February 2015, the AUC approved Maxim's application for an 86-MW expansion (M3) to M1; the expansion will be composed of two natural gas-fired turbines located next to M1. Exhaust energy from these turbines will be converted to steam and utilized to generate electricity in the existing M1 steam turbine, displacing coal-sourced steam. These two initiatives will increase the capacity at the Milner site from 150 MW to 756 MW.

Construction timing for both projects is pending clarity on new Alberta provincial climate change initiatives and regulations. It is also anticipated that M3 would be completed in advance of M2.

51 Highway Claude-Béchar (Highway 85) – Phase 3

\$947 million 

NEW

Location: Saint-Antonin to Saint-Louis-du-Ha! Ha!, Quebec

Owner: Transports Québec

Funding: Public

- **Federal** New Building Canada Fund's National Infrastructure Component: \$389.7 million
- **Provincial** \$557.3 million

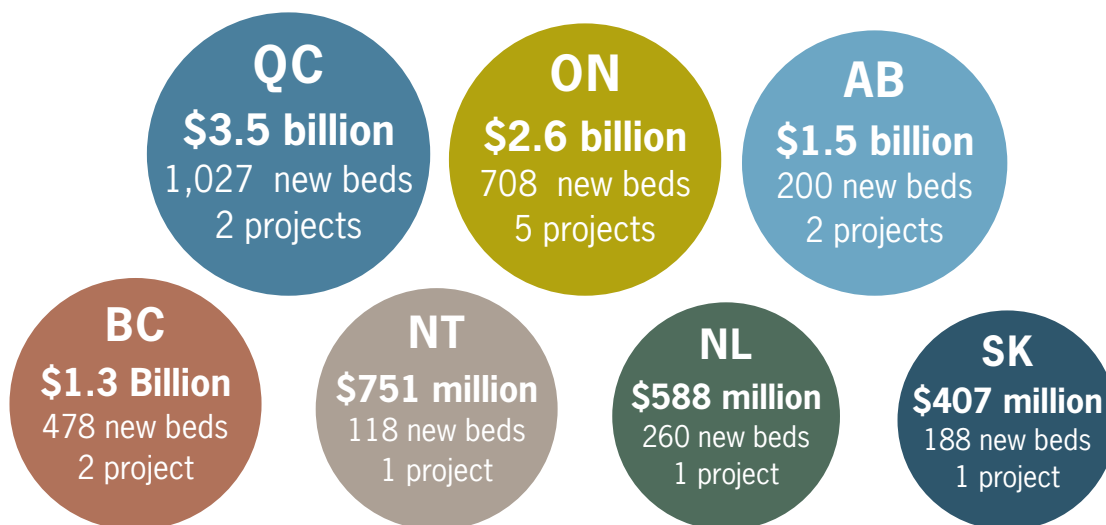
Financing

The Government of Canada selected this project for funding consideration for up to \$389.7 million under the New Building Canada Fund's National Infrastructure Component. The Quebec Ministry of Transport has set aside \$557.3 million, as set out in the 2015-2025 Québec Infrastructure Plan. The ministry will also be responsible for all remaining costs of the project, which has an estimated cost of \$947.33 million. This funding is conditional on the project meeting applicable federal eligibility requirements with respect to the New Building Canada Fund and the signing of a contribution agreement.

This project involves the last 40 kilometre section from Saint-Antonin to Saint-Louis-du-Ha! Ha!, which will benefit the entire province of Quebec, as Highway 85 is vital to the economic development of eastern Canada. Expanding the existing highway (route 185) to four lanes in this section will make Highway 85 safer and more efficient for those using it and facilitate the transport of goods between Quebec and the Maritime provinces. Construction work on this segment of the highway will begin in 2017.

Health Care Breakdown

*Projects such as redevelopments or university medical centres may not include new beds



Total Investment:
\$10.6 billion

Total New Beds:*
2,979

Total Project Count:
14

Credit: CHU Sainte-Justine



52 Sainte-Justine University Hospital Centre

\$939.6 million



2015 Rank: 53

Location: Montreal, Quebec

Owner: Sainte-Justine University Hospital Centre

Project Manager: TTDC Consortium—Tecsult, DECASULT (AECOM), CIMA + ; WSP

Engineer: • Expansion: SNC-Lavalin (design engineer)
• Modernization: Pellemon/Bouthillette, Parizeau et Associés (electrical, mechanical); SKD/NCK Consortium—Saïa, Deslauriers, Kadanoff, Leconte, Brisebois, Blais and Nicolet Chartrand Knoll (civil, structural)

Contractor: SNC-Lavalin (EPC contractor for expansion)

Financiers/Banks: National Bank (lead arranger for financing)

Legal: Fasken Martineau DuMoulin (advised authority); McCarthy Tétrault (advising lenders to proponent); Norton Rose Fulbright (represented successful proponent)

Consulting Architect:

- Expansion: Provencher Roy, Menkès Shooner Dagenais Letourneux
- Modernization: Brière, Demontigny, Gilbert et Associés, Hébert Fortin Martin Consortium, Jodoin Lamarre Pratte (compliance architects), Lemay et Associés, Métivier, Provencher Roy

Financier: CIBC World Markets (mandated lead arranger for SNC-Lavalin)

Supplier: Demix Beton (concrete)

Other: Mott MacDonald (lender's technical advisor)

Funding: Public/Private

• **Provincial**
\$869.6 million

• **Private**
Sainte-Justine Hospital Foundation:
\$70 million

Sainte-Justine University Health Centre is a teaching hospital affiliated with the Université de Montreal. It specializes in obstetrics and other care for mothers and children. The objective of the hospital's upgrades are to provide a hospitalization and work environment that is modern and adapted to patients' needs while also considering impacts on the environment and surrounding community. This project, which is targeting LEED-Silver certification, consists of two components: an expansion involving the construction of new buildings, as well as a modernization program for existing structures.

Expansion

A new special care unit is being constructed which will add over 43,000-square-metres of space to the facility. Specialized care units for integrated pediatrics, specialized pediatrics and trauma surgery space with 120 beds, a surgery department with 11 operating theatres and three procedure rooms, 32 pediatric and intensive care beds, a high-risk pregnancy unit, a 23-bed birth unit, 80 neonatal intensive care beds, as well as medical imaging facilities. A new leading-edge research centre is also part of the expansion, with both wet and dry laboratory modules, auditoriums, common spaces, office floors, conference rooms, halls, and teaching rooms. The new multilevel underground parking lot opened in June 2014. The specialized care units and research centre are scheduled for completion by summer 2016.

Modernization

This component is being carried out in several phases, some of which have already been completed. Construction activity is ongoing, and premises vacated following relocation to the new building will be modernized between 2016 and 2018.



Credit: Aboriginal Affairs and Northern Development Canada

53 Giant Mine Remediation Project

\$903.5 million



2015 Rank: 54

Location: Yellowknife, Northwest Territories

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

Project/Construction Manager: AANDC and the Government of the Northwest Territories; AECOM (construction management)

Financing

Aboriginal Affairs and Northern Development Canada (AANDC) requested the Audit and Evaluation Sector (AES) conduct a value-for-money audit of the remediation project to examine the ability of a government organization to discharge its responsibilities and control their costs by ensuring resources are managed economically. In this analysis, total project costs were estimated at \$903.5 million through 2025. (Beyond 2025, the government estimated there would be \$1.98 billion in operations and maintenance costs through 2137.)

Other: Parsons (project planning/permitting, decontamination, hazardous waste abatement, deconstruction, construction management); Golder Associates (multi-disciplinary consulting services, general and civil design); Hatch (design); SRK Consulting and SENES Consultants (lead technical advisors)

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 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 Deton'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. Under a multi-year services agreement with AANDC, Public Works and Government Services Canada (PWGSC) is contributing project management, engineering, procurement, and environmental services.

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 EA. The project's goal is to ultimately protect public health and safety and the environment through longterm containment and management of the site's waste, water treatment, and surface cleanup at the site. General discussions with stakeholders to prioritize the measures have already begun. Project completion is expected in 2025.

54 Sunrise Natural Gas Processing Plant

\$860 million



NEW

Location: Montney Region, British Columbia

Owner: Veresen Midstream Limited Partnership—Veresen (50%) and affiliates of Kohlberg Kravis Roberts & Co. (50%)

Project/Construction Manager: Encana

Engineer: Fluor

Contractor: Ledcor

Funding: Private

This new plant is one of three gas plants that Veresen plans on building in the Dawson Creek region. The Sunrise plant is expected to process 400 million cubic feet of gas per day, while Tower, with approval expected in late 2015, would be 200 million cubic feet a day. The existing Saturn plant would be expanded to allow for an additional 400 million cubic feet of gas a day, with approval expected in early 2016. Construction of the Sunrise gas plant has commenced, with the facility expected to be in service in late 2017.

55 Canadian Forces Base Trenton Expansion

\$860 million



2015 Rank: 56

Location: Trenton, Ontario

Owner: Department of National Defence

Engineer: Amec Foster Wheeler; SNC-Lavalin; Jain & Associates; J.L. Richards & Associates; Peak; Stantec

Contractor: Bird Construction; SNC-Lavalin; Bondfield Construction; Buddy Haegele Enterprises; Budget Environmental Disposal; Dufferin Construction; Graham (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

Environmental Services: LVM

Consulting Architect: Architecture 49 (previously Smith Carter Architects), Colbourne & Kembel Architects Inc., Jacobs Carter Burgess, Kasian Architecture Ontario, Robertson Martin Architects Inc.

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

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

Funding: Public

• **Federal** \$860 million



Credit: 8 Wing Imaging/CFB Trenton

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) by late 2014, 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. The project continues and is expected to be finalized by 2022.

2016 Top100 Project Delivery

Total Investment: \$161.3 billion

44
Public
\$76.1
billion

(47% of list value)

33
Public-Private
Partnerships
\$52.4
billion

(32% of list value)

17
Private
\$18.8
billion

(12% of list value)

6
Public/Private
\$14.0
billion

(9% of list value)



Credit: Plenary Infrastructure ERMF

56 East Rail Maintenance Facility

\$859.2 million 

NEW

Location: Whitby, Ontario

Owner: TTC

DBFM Team: Plenary Infrastructure ERMF—Plenary, Kiewit, and Bird Capital (developer); Bird Design-Build and Peter Kiewit Infrastructure (construction); Stantec Consulting and Arup (design); Honeywell and Toronto Terminals Railway (facilities management); TD Bank, Bank of Montreal, and TD Securities (financing)

Engineer: Arup (structural and geotechnical engineering, IT/communications, rail engineering); Hatch (owner's engineer)

Legal: Aird & Berlis (advised gvt.); Dentons Canada (legal advisor); Fasken Martineau DuMoulin (counsel to lenders to consortium); Gowling Lafleur Henderson (counsel to Plenary)

Supplier: DECAST Ltd. (precast metric chambers)

Other: Aon (risk/insurance advisor to authority); BTY Group (lenders' technical advisor and payment certifier); Ernst & Young (advising gvt.); Golder Associates (geotechnical/hydrogeological engineering, lab/construction monitoring services); Infrastructure Ontario; Parsons (signage design); WSP (geotechnical services)

Funding: P3

- **Provincial** Ministry of Transportation capital allotment to Metrolinx: \$859.2 million

Financing

The financing for the project included \$183 million long-term bonds and \$112 million short-term bonds underwritten and placed privately by TD Securities, as well as \$137 million construction period credit facility provided by TD Bank and Bank of Montreal.

The facility includes approximately 500,000 square feet of new buildings. The project also includes tracks and storage for 13 12-car passenger trains; built-in capacity to store an additional nine passenger trains for future use; stations to repair, maintain, fuel, wash and power GO trains; staff and visitor parking; and sustainable design and construction features. Currently, all rail maintenance activities are performed at GO Transit's Willowbrook Rail Maintenance Facility, including refueling, daily inspections, train washing, and repairs. A second rail facility is required to service GO Transit's growing rail fleet. Substantial completion is anticipated for the end of 2017.

57 New Cancer Centre in Calgary

\$830 million 

2015 Rank: 41

Location: Calgary, Alberta

Owner: Alberta Health Services

Consulting Architect: HKS and Marshall Tittlemore Architects (subconsultants)

Other: Arup (technical advisor and prime consultant); Ernst & Young (advising gvt.); Hanscomb (owner's design stage cost consultant)

Funding: Public/Private

- Provincial \$830 million over the next five years

Financing

Additional funding will be looked at as the project progresses. Original estimates placed the total cost at around \$1.3 billion.



Credit: Alberta Infrastructure

This new comprehensive cancer centre is to be built at the Foothills Medical Centre in Calgary. The 80,000-plus-square-metre complex will include inpatient beds, an outpatient facility, cancer diagnostic and treatment technologies, and dedicated space for research. The centre will provide much-needed access to cutting-edge treatment and care for residents of Calgary and southern Alberta. Project planning and pre-procurement is underway. Construction is slated to begin in 2017. The facility will open in 2024.

58 Fairview Container Terminal (Prince Rupert Container Terminal Expansion)

\$820 million 

2015 Rank: 58

Location: Prince Rupert, British Columbia

Owner: Maher Terminals, which has a 30-year agreement with the Prince Rupert Port Authority.

Environmental Services: SNC-Lavalin

Other: Stantec (environmental mitigation strategy report); Golder Associates (geotechnical)

Funding: Private

This project consists of the expansion of the existing port into a state-of-the-art container terminal. Once completed, the new terminal will occupy 200 acres of land and be capable of handling 1.2 million twenty-foot equivalent units annually. The project is comprised of two phases.

Phase 1 was completed in late 2007 and cost \$170 million. It consisted of three 120-metre-high cranes capable of handling 500,000 TEUs annually.

A comprehensive study report for Phase 2 was completed in late 2012. Planned investment for the Phase 2 development totals \$650 million and includes a \$90-million Road Rail Utility Corridor. This corridor includes construction of five parallel rail tracks, a two-lane roadway, and a port-owned power distribution system along an eight-kilometre corridor.

Construction of Phase 2 is underway and is expected to be completed by 2017.

59 Region of Waterloo LRT – Stage 1

\$818 million 

2015 Rank: 59

Location: Waterloo, Kitchener, and Cambridge, Ontario

Owner: Region of Waterloo

DBFOM Team: GrandLinq—Plenary, Meridiam, Aecon, Kiewit, and Keolis

Engineer: WSP | Parsons Brinkerhoff (owner's engineer: includes technical advisor, program manager and owner's engineer role, Stage 1 ESA)

Environmental Services: Golder Associates (environmental consulting engineers); Hatch (EA)

Financiers/Banks: CIBC World Markets (underwriter and bookrunner to GrandLinq)

Legal: Blake, Cassels & Graydon (counsel to successful proponent); Fasken Martineau DuMoulin (advised lenders); Gowling Lafleur Henderson (counsel to GrandLinq); Norton Rose Fulbright (acted for Waterloo)

Architect: PBK Architects (station stop design)

Vehicle Supplier: Bombardier

Supplier: Siemens

Other: AECOM (project assessment process team); Aon (risk/insurance advisor to authority); BTY Group (lenders' technical advisor); Golder Associates (construction); Infrastructure Ontario (procurement advisor); Hanscomb (EA engineer's cost consultant); INTECH (insurance advisor); LeighFisher (lenders' technical advisor)

Funding: P3

- **Federal** Building Canada Fund: \$265 million
- **Provincial** \$300 million
- **Municipal** \$253 million

Transit options for the Region of Waterloo were debated at length before light-rail technology was selected instead of bus rapid transit.

This rapid transit service will shape the future of the community's transportation system by bringing LRT in two stages. Stage 1 is expected to open in 2017 and includes a 19-kilometre LRT route from Conestoga Mall Transit Terminal to Fairview Park Mall Transit Terminal, with stops in downtown Kitchener, Grand River Hospital, UpTown Waterloo, both universities, and Waterloo Park. It also features a 17-kilometre route of adapted bus rapid transit (aBRT) from Fairview Park Mall to the Ainslie Street Terminal in Cambridge, with four stops along Hespeler Road.

Stage 2 will see the BRT line converted to LRT, creating a seamless 37-kilometre service of 23 stops between Cambridge and Waterloo. Detailed design is underway, and construction of Stage 1 has commenced and is on track.

60 Providence Care Hospital

\$810 million 

2015 Rank: 60

Location: Kingston, Ontario

Owner: Providence Care Hospital

DBFM Team: Integrated Team Solutions—EllisDon (developer, design-builder, equity provider); Fengate Capital Management Ltd., Parkin Architects, Johnson Controls, and Scotiabank Global Banking and Markets

Engineer: WSP | MMM Group

Financiers/Banks: National Bank Financial (co-lead underwriter)

Legal: Bennett Jones (acting for IO and owner); Gowling Lafleur Henderson (counsel to ITS); McCarthy Tétrault (counsel to lenders)

Consulting Architect: Parkin Architects and Adamson Associates Architects JV

Supplier: Canam Group

Other: Aon (risk/insurance advisor to authority); BTY Group (ind. certifier); Entro (signage and wayfinding); Ernst & Young (advising team); Infrastructure Ontario (procurement lead); INTECH (insurance advisor);

Funding: P3

The 270-bed Providence Care Hospital will reside on the Kingston Provincial Campus, adjacent to the existing Mental Health Services site. This facility will host a number of services currently offered at the Providence Care St. Mary's of the Lake Hospital, including physical medicine and rehabilitation, geriatric medicine, complex continuing care, palliative care, and mental health care. It will also be home to several cutting-edge learning and research facilities that will allow Providence Care to educate staff and community partners. Substantial completion is expected in 2016.

61 Union Station Revitalization Project

\$800.7 million



2015 Rank: 62

Location: Toronto, Ontario

Owner: City of Toronto

Construction Manager: Carillion

Program Manager:

WSP | MMM Group

Engineer: NORR Limited

Architects & Engineers,
part of the Ingenium Group
(design; prime consultant)

Contractor: Clifford Restoration
(building envelope restoration);
EllisDon (general contractor)

Legal: WeirFoulds
(acting for architects)

Consulting Architect: DIALOG
(executive architect of retail features)

Supplier: Canam Group (steel deck)

Other: Arup (4D modelling, pedestrian flow, construction coordination analyses); Entro (wayfinding and signage); Engineering Harmonics (AV specialty consultants); FGMDA (heritage consultant); Golder Associates (construction mat. engineering/testing); Hanscomb (study and design teams' cost consultant); WSP (geotechnical consultant)

Funding: Public

- **Federal**
\$164.5 million
- **Provincial**
\$172 million
- **Municipal**
\$464.2 million
(estimated)

Financing

The original budget was \$640 million, with federal (\$164.5 million), provincial (\$172 million), and municipal (\$303.7 million) investments. In 2014, the budget increased to \$796.4 million and, in June 2015, increased to \$800.7 million. The increase would have been higher, but the city committee approved deferring Phase 2 of the northwest PATH extension to free up \$55 million.

The revitalization project includes restoration of many of the station's heritage elements, creation of 160,000 square feet 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-square-foot 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 and will remain closed for two years. Substantial completion is expected by the end of 2017.



Credit: Transports Québec

62 Highway Claude-Béchar (Highway 85) – Phases 1 and 2

\$754.4 million



2015 Rank: 40

Location: Rivière-du-Loup to the
New Brunswick border, Quebec

Owner: Transports Québec

Engineer: AECOM; BPR-Batiment;
CIMA + ; Dessau; WSP (designer);
Roche; SNC-Lavalin (design)

Environmental Services: AECOM
(environmental impact study,
hydraulic, and hydrologic studies)

Supplier: Holcim
Canada (cement)

Other: Tetra
Tech (roadway engineering and construction supervision)

Funding: Public

- **Federal**
\$281.1 million
- **Provincial**
\$473.3 million

This project will expand 94 kilometres of Route 185 from two lanes to a divided four-lane highway, significantly reducing bottlenecked traffic and road delays. As a part of the Trans-Canada Highway and the main route between the Maritimes and the rest of Canada, the project has received significant federal funding. It is currently in Phase 2 of its construction and is expected to be completed by 2016.

63 Stanton Territorial Hospital Renewal Project

\$751 million



NEW

Location: Yellowknife, Northwest Territories

Owner: Government of the Northwest Territories

DBFM Team: Boreal Health Partnership—Carillion, HOCHTIEF PPP Solutions North America, and Bird Capital (developers); Bird Construction, Clark Builders, and Kasian Architects (design-builder); Crossey Engineering and Weiler Smith Bowers Consulting Structural Engineering (engineers); Carillion (service provider)

Financiers/Banks: BMO (financial advisor to Boreal Health Partnership); CIBC (underwriter)

Legal: Blake, Cassels & Graydon (counsel to successful proponent)

Financing

The \$751 million is broken into \$350 million for the three-year construction costs and the remaining for care and maintenance post construction.



Credit: Government of the Northwest Territories

Other: Aon (risk/insurance advisor to private partner); Ernst & Young (advising govt.); INTECH (insurance advisor)

Funding: P3

The new Stanton Territorial Hospital will be over 26,000 square metres and will offer outpatient and inpatient services including emergency, medical imaging, dialysis, obstetrics, pediatric, cardio and mental health departments, as well as day procedure and surgery suites. The new facility will have 100 inpatient beds, plus an 18 bed Extended Care Facility separate from the hospital. The existing Stanton Territorial Hospital was constructed in 1988 and is approximately 13,300 square metres in area with 80 inpatient beds (including Extended Care). The project is expected to be completed by 2018.

64 Ruskin Dam and Powerhouse Upgrade

\$748 million



2015 Rank: 64

Location: Mission, British Columbia

Owner: BC Hydro

Engineer: BC Hydro; MWH Americas; Golder Associates (right abutment)

Contractor: Golder Construction (right abutment – Phase 2); Flatiron-Dragados JV (upper dam and spillway gates, balance of plant)

Turbine Supplier: Voith Hydro

Supplier: HMI Construction (spillway gates); COH (powerhouse crane); Fortune Electric (generator step-up transformers); ABB (exciters); L&S Electric of Canada (governors)

Other: Hemmera (First Nation consultation and negotiation services)

Funding: Public

• **Provincial BC Hydro:** \$748 million



Credit: BC Hydro

The Ruskin Dam generation station has supplied power to the BC Hydro grid for almost 80 years and requires upgrades to ensure operational reliability and improve safety in the event of an earthquake.

There are four major components to this project:

- The right bank of the dam is being reinforced with a specially designed cutoff wall, which will control and manage water seepage.
- Seven concrete piers and spillway gates will be removed and replaced with five new ones, and the one-lane road on top of the dam will be replaced with a two-lane road.
- The powerhouse facility will be seismically upgraded and the powerhouse turbines, generators, and ancillary equipment will be upgraded or replaced (including upgrades to penstocks and intake tunnels that move water from the reservoir to the powerhouse).
- The switchyard, currently located on the roof of the powerhouse, will be rebuilt and relocated to the left bank behind the road.

The upgrades to the right bank are complete, and the replacement of the piers and spillway gates is underway. Approved by the British Columbia Utilities Commission in April 2012, construction began that year and the facility is expected to be in service in 2017.

65 Union Station Infrastructure Renewal Program

\$700 million



2015 Rank: 67

Location: Toronto, Ontario

Owner: City of Toronto

Project/Construction Manager:

A JV with Hatch (lead), Parsons, and IBI Group

Other: Entro (signage and wayfinding consultant); Morrison Hershfield (track/signals eng. for conceptual work); WSP (geotechnical consultant, design services)

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. It has 14 station tracks with platform access and more than 180 signals, 250 switch machines, 40 kilometers 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 signaling technology.

The scope of work has included track additions and upgrading, replacement of all special trackwork in the multi-track rail corridor extending four miles east and west of the station, and replacement of the 90-year-old signaling system with new state-of-the-art signals, communications, power supply, CCTV, and SCADA systems. This 10-to-20-year improvement program aims to relieve overcrowding and allow for future growth. The program is expected to wrap up in 2019.

Credit: Metro Vancouver



66 Lions Gate Secondary Wastewater Treatment Plant

\$700 million



2015 Rank: 68

Location: North Vancouver, British Columbia

Owner: Metro Vancouver

Engineer: AECOM; CH2M (sub-consultant for process design development)

Consulting Architect: Miller Hull

Other: BTY Group (cost consultant); Golder Associates (geotechnical evaluations); Maple Reinders (compatibility advisor); Space2Place (public consultation, research and analysis, concept development)

Funding: P3

Financing

The Greater Vancouver Sewerage and Drainage District has issued an RFQ to design, construct, and partially finance the plant and to manage its operation for up to one year.

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. Metro Vancouver will use a design-build-finance (extended warranty and holdback) delivery model and other conveyance upgrades using the conventional design-bid-build delivery model.

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.



Credit: Northland Power

67 Marmora Pumped Storage Project

\$700 million 

2015 Rank: 69

Location: Marmora, Ontario

Owner: Northland Power

Funding: Private

This 400 MW pumped storage project will make use of an abandoned water-filled open-pit mine to store energy like a battery. Located on private land in Marmora, Ontario, the project will use low rate, off-peak energy to pump water into a raised reservoir, which will be constructed above the existing mine. During peak hours, when energy prices are higher, the water will be released into the mine through a hydroelectric turbine to generate electricity. In this way, excess electricity from non-controllable sources like solar and wind generators can effectively be stored for any desired period of time. Although pumped storage technology is new to Canada, it has been in use in Europe, the United States, and Japan since at least the 1960s. The project is endorsed by the County, Township, and many local residents. The development phase of the project continues as Ontario's energy supply remains an important area of infrastructure development. Northland Power continues to work with the Independent Electricity System Operator to secure an energy services contract. They hope to complete the project by 2020.

68 Trans Labrador Highway Widening and Hard Surfacing

\$683 million 

2015 Rank: 70

Location: L'Anse aux Clair to Labrador City, Newfoundland and Labrador

Owner: Government of Newfoundland and Labrador

Contractor: Pavex, Mike Kelly and Sons, and Humber Valley Paving

Other: Hatch (pre-design, design, construction supervision and layout, administration, QA/QC)

Funding: Public

The Trans Labrador Highway has been one of the most significant infrastructure projects in the province's history. The road spans close to 12,000 kilometres and over 500 kilometres has been paved. The paving and widening of this major piece of transportation infrastructure, the first continuous connection across Labrador, will connect residents with jobs, products, and economic opportunities. The project is ongoing.

69 BC Children & Women's Hospital/Health Centre Redevelopment

\$676 million 

2015 Rank: 71

Location: Vancouver, British Columbia

Owner: Provincial Health Services Authority

Phase 2 DBFM Team: Affinity Partnerships—Balfour Beatty Investments and Ledcor Group (lead); Zimmer Gunsul Frasca Architects and CEI Architecture (design); Balfour Beatty Construction and Ledcor (construction); Balfour Beatty Communities and Black & McDonald (services)

Legal: McCarthy Tétrault; Fasken Martineau DuMoulin

Consulting Architect: ZGF Architects and CEI Architecture

Supplier: Canam Group (steel deck supplier)

Other: Aon (risk/insurance advisor to private partner); BTY Group (cost consultant and independent certifier); Ernst & Young (advising gvt.); INTECH (insurance advisor); Turner & Townsend (lenders technical advisor); WSP (owner's rep, other roles)

Funding: P3

- **Provincial** \$534 million
- **Private** BC Children's Hospital Foundation: \$144 million toward Phase 2

The BC Children's and BC Women's Redevelopment Project is building a new Teck Acute Care Centre at BC Children's Hospital and BC Women's Hospital + Health Centre in addition to renovating other areas on the Oak Street campus. The redevelopment project's vision is for a campus of patient-centred care that operates in an environment of quality, excellence and innovation. The renovations and new facilities will also assist in attracting and retaining health professionals, clinical staff and researchers.

The Redevelopment Project is now in Phase 2, which involves the construction of the Teck Acute Care Centre (TACC) and the renovation of the Assessment Room/Urgent Care Centre (UCC) in the BC Women's Hospital main building. The building will be 59,400 square-metres with eight floors of clinical space with 231 inpatient rooms and 87 outpatient exam beds. It will include healing gardens, public art and a one-kilometre Wellness Walkway that will encircle the hospital site. Construction began in May 2014 and the new Teck Acute Care Centre will see its first patient in late 2017.

70 Mosaic Stadium

\$675 million

2015 Rank: 72



Location:

Regina, Saskatchewan

Owner: City of Regina

DBF Team: PCL
(construction and
finance team lead); HKS
Sports & Entertainment
(lead design engineer
and sports architect);
B + H Architects
(architect of record);
TD Securities
(financial advisor)

Supplier: Canam Group

Other: INTECH
(insurance advisor);
Mott MacDonald; BTY
Group (ind. certifier)

Funding: P3



Credit: City of Regina

The first phase of the Regina Revitalization Initiative, the Stadium Project will be the new home of the Saskatchewan Roughriders of the Canadian Football League. The stadium is centrally located at Evraz Place. The new multi-purpose facility will be an iconic structure not only for Regina, but the entire province. The stadium will have a capacity of 33,000, which is expandable to 40,000 and will be a suitable venue for many types of sports and entertainment events throughout the year. Construction began in June 2014 and substantial completion is scheduled for August 2016. The first Roughrider game in the new stadium will be played in June 2017.

71 Juan de Fuca Power Cable

\$665 million



2015 Rank: 73

Location: Victoria,
British Columbia to
Port Angeles, Washington

Owner: Sea Breeze Power

Project/Construction Manager: Sea
Breeze Power and Boundless Energy JV

Financiers/Banks:
Energy Investors Funds

Other: Aon (risk/insurance
advisor to authority)

Funding: Private

This 550-MW electricity transmission line will be the first international power connection across the Strait of Juan de Fuca. The 50-kilometre line will link Vancouver Island with the Olympia Peninsula region in Washington State, 30 kilometres of which will be underwater. The bi-directional cable will increase speed and efficiency of transmission between Canada and the United States, an issue for certain types of fluctuating renewable energy, such as wind and solar. The cable will use state-of-the-art transmission technology and will improve reliability of the electricity supply with minimal environmental impact. All technical studies are complete and permits in place. The cable is expected to be operational by 2017.

72 Grande Prairie Regional Hospital

\$647.5 million



2015 Rank: 74

Location: Grande Prairie, Alberta

Owner: Alberta Health Services

Project/Construction Manager:
Graham (construction manager)

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

Consulting Architect: DIALOG (prime
consultants); Stantec with HOK (design);
Stantec (landscape architecture); ISL
Engineering and Land 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. Work continues on the superstructure, which is about 60 per cent complete. The facility is expected to open in 2019.

73 Joint-Use Schools Project

\$635 million



NEW

Location: Martensville, Regina, Saskatoon, and Warman, Saskatchewan

Owner: Government of Saskatchewan

DBFM Team: Joint Use Mutual Partnership—Concert Infrastructure and Bird Capital Limited Partnerships (equity providers); Bird Design-Build Construction (construction); Wright Construction Western (construction); GEC Architecture (design); Kindrachuck Agrey Architecture (design); Johnson Controls (service provider)

Engineer: WSP (civil, electrical, and mechanical engineering consulting services to JUMP)

Legal: Aird & Berlis (advised gvt.); Blake, Cassels & Graydon (counsel to P3 team)

Other: Aon (risk/insurance advisor to authority); BTY Group (independent certifier); Ernst & Young (advising team); INTECH (insurance advisor); Mott MacDonald (lenders' technical advisor); SaskBuilds

Funding: P3
• **Provincial**
\$635 million

The Government of Saskatchewan is using the P3 model to build 18 new elementary schools on nine joint-use sites, which will include 810 new child-care spaces as well as new community space. These publicly owned schools are being built to accommodate the unprecedented growth taking place in these communities. Construction will be complete before September 2017.

74 Regina Wastewater Treatment Plant

\$611 million



2015 Rank: 75

Location: Regina, Saskatchewan

Owner: City of Regina

DBFOM Team: EPCOR Saskatchewan Water Partners—EPCOR Water Services, Graham Group, Lockerbie Stanley/Aecon, and Stantec

Legal: Norton Rose Fulbright

Other: Aon (risk/insurance advisor to authority); BTY Group (independent certifier)

Funding: P3
• **Federal** P3 Canada
Fund: \$58.5 million

This treatment plant will increase the City of Regina's wastewater treatment capacity and modernize the facility through upgrades to the primary (non-organic) and secondary (organic) treatment processes and the construction of a new tertiary treatment process. The new system will provide treatment capacity for a population of 258,000 and significantly reduce ammonia, nitrogen, phosphorous, *E. coli*, and suspended solids levels from entering the water system. The Province of Saskatchewan has raised effluent standards to improve water quality and the environment, and to meet these new standards, a new wastewater facility is required. The new facility will be substantially complete in December 2016.

75 Rogers Place Arena Project

\$606.5 million



2015 Rank: 76

Location: Edmonton, Alberta

Owner: City of Edmonton

Project Manager:
ICON Venue Group

Construction Manager: PCL

Engineer: Thornton-Tomasetti Engineers (structural) and ME Engineers Inc. (mechanical and electrical)

Legal: Dentons Canada (legal advisor)

Consulting Architect: HOK; DIALOG (sub-consultant)

Supplier: Canam Group

Other: BTY Group (cost consultant)

Funding: P3
• **Federal** \$7 million
• **Provincial** \$32 million
• **Municipal** \$279 million
• **Private** \$288.5 million (\$161.5 million from Edmonton Arena Corporation (EAC), \$125 million ticket surcharge, \$2 million MacEwan University)



Credit: Jason Woodhead/23 via Flickr

Rogers Place, Edmonton's new downtown arena, will become the centre of a new entertainment district in the heart of Alberta's capital city and the new home of the Edmonton Oilers. The design will integrate the \$480-million arena with an adjacent \$7-million light-rail transit station and a \$15-million outdoor pedway that provides event space and a pedestrian connection with adjacent development. Plans also include a \$21-million, 1,000-seat community rink attached to the arena, an overpass, and a large \$53-million Winter Garden providing a climate-controlled event venue for public use.

Work on Rogers Place began on March 3, 2014. The first phase, excavation and foundation work, was completed in 2014. The build entered the second phase in fall 2014, which includes erecting the steel and concrete structure. The entire build is expected to take 2.5 years, with the arena opening in fall 2016.

76 North Island Hospitals Project

\$606.2 million



2015 Rank: 77

Location: Campbell River and Comox, British Columbia

Owner: Vancouver Island Health Authority

DBFM Team: Tandem Health Partners—Balfour Beatty Capital, Graham Group, Connor Clark & Lunn GWest Traditional Infrastructure, Balfour Beatty with Farmer Construction, Stantec, Blue Cottage Consulting, Honeywell, and Balfour Beatty Communities

Project Manager: WSP | MMM Group (project management and engineering services)

Engineer: McElhanney (owner's civil eng.); WSP (owner's eng., compliance eng.)

Financiers/Banks: National Bank Financial (financial advisor and co-lead underwriter)

Legal: DLA Piper (Canada) (financial counsel)

Consulting Architect: WSP (compliance architects)

Other: Aon (risk/insurance advisor to private partner); BTY Group (ind. certifier); DIALOG (compliance consultant); Ernst & Young (advising gvt.); INTECH (insurance advisor); Mott MacDonald (lender's technical advisor)

Funding: P3

• **Provincial** Province: \$368.7 million; Comox-Strathcona Regional Hospital District: \$237.5 million

The Vancouver Island Health Authority is constructing two new hospitals: one 153-bed hospital in Comox Valley, which will have a 71 per cent increase in space over the Campbell River District General Hospital, and one 95-bed hospital in Campbell River, which will have a 69 per cent increase in space over St. Joseph's General Hospital. Following financial close, construction was able to begin at both sites. Preparation work has begun, which includes the removal of trees, construction of temporary parking lots, pavement of access roads, the erection of construction fencing, and excavation and installation of water and gas lines. Completion is estimated for late 2017.

77 Gordon M. Shrum Generating Station Refurbishment

\$600 million



2015 Rank: 78

Location: Peace River, British Columbia

Owner: BC Hydro

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. Three turbines have been replaced and returned to service, while the fourth is in the midst of being serviced.

Voith, a contractor on this project, estimates each turbine replacement will take about nine months, and the final replacement is expected to be complete by mid-2015. Scheduled warranty inspections will continue until early 2017. The last of the current capital projects is slated to conclude in 2018.

78 East-West Tie Transmission Project

\$600 million



2015 Rank: 79

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 (EA); Golder Associates (environmental and social impact assessment, inspection services for geotech drilling program)

Legal: Gowling Lafleur Henderson (counsel to NextBridge)

Supplier: Canam Group

Other: Ontario Energy Board and the IESO

Funding: Private

• **Provincial** \$600 million

This transmission project is planned to consist of a new 450-kilometre, double-circuit, 230-kV transmission line, primarily paralleling an existing transmission line corridor, which connects the Wawa Transformer Station to the Lakehead Transformer Station in the Municipality of Shuniah, near Thunder Bay. The need for the project was established by the Independent Electricity System Operator to provide a reliable electricity supply to northwestern Ontario and is expected to increase total eastbound and westbound capabilities from the current 175 MW to 650 MW. The EA and leave-to-construct applications are being prepared and are currently anticipated to be filed in 2017. The targeted in-service date is 2020.

79 Bonnybrook Wastewater Treatment Plant D Expansion

\$600 million 

NEW

Location: Calgary, Alberta

Owner: City of Calgary

Project/Construction Manager: Graham Construction

Consulting Architect: Stantec

Other: Hanscomb (owner's design stage cost consultant)

Funding: Public

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 327,000 people. When Phase 3 of construction is completed in 2022, the facility will service a population of 1.275 million people.

Plant D will be composed of separate facilities running the three wastewater treatment processes. The expansion includes adding primary and secondary clarifiers, a biological nutrient removal system, and filtration. The city is also upgrading the ultraviolet disinfection system as well as the primary and secondary sludge thickening systems. In addition to the new plant, the city is making upgrades to the current facility, including adding a flood resiliency component to protect critical infrastructure from river flooding, overland flooding, and flooding from too much sewage.

Preliminary design for Phase 3 is wrapping up and pre-construction work should start in 2016, with actual construction commencing in 2017. Phase 1 and 2 will be completed in 2020, with Phase 3's completion scheduled for 2022.

80 New Hospital in Corner Brook

\$588 million 

2015 Rank: 81

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, PCL Construction, and Marco Construction

Engineer: WSP (structural engineers, sustainability consultants)

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

Other: 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. Site preparation activities are underway, and this project has entered the design phase. The project is expected to wrap in 2018.

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

\$587.3 million 

2015 Rank: 80

Location: Winnipeg, Manitoba

Owner: City of Winnipeg

Consulting 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: Deloitte (financial); Hanscomb (engineer's cost consultant); LeighFisher (lenders technical advisor)

Funding: P3

- **Federal** \$137.3 million
- **Provincial** \$225 million
- **Municipal** \$225 million

This 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. The project is currently in the procurement phase for a DBF(O)M P3, with an RFP issued in July 2015. The successful proponent will be awarded the contract in mid-2016. Construction is expected to start in summer 2016 with completion late 2019. Operator training and facility commissioning will be carried out, with full operation expected to commence in April 2020.

82 North End Sewage Treatment Plant Biological Nutrient Removal Upgrade

\$569.4 million 

NEW

Location: Winnipeg, Manitoba

Owner: City of Winnipeg

Project/Construction

Manager: KGS Group (owner's advocate/consultant)

Legal: Blake, Cassels & Graydon

Funding: Public

- **Provincial** \$195 million
- **Municipal** \$374.4 million

The Province of Manitoba has issued the City of Winnipeg an Environment Act License 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 upgrade is to be completed by December 2019.



83

Annacis Island Wastewater Treatment Plant Expansion

\$550 million



NEW

Location: Delta, British Columbia

Owner: Metro Vancouver

Engineer: Brown and Caldwell (lead) with Stantec, EIC Solutions, and Klohn Crippen Berger; Hatch (tunnel design)

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

Other: JJM Construction and Geopac Inc. (prepare the ground and relocate utilities)

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 Burnaby, Maple Ridge, Delta, Surrey, Pitt Meadows, Langley, and White Rock. The Annacis expansion is to be built in two phases, with the first phase to be finished in 2019 and the second stage in 2022. This project is Stage 4 of an eight-stage facility plan to be completed by 2036.

84

Peel Memorial Centre for Integrated Health and Wellness

\$530 million



2015 Rank: 90

Location: Brampton, Ontario

Owner: William Osler Health System

Project/Construction Manager: Infrastructure Ontario (joint construction manager with Plenary Health team)

DBFM Team: Plenary Group (Canada) (developer); PCL Constructors Canada (constructor); Diamond Schmitt Architects and RTKL Associates (architects); RBC Capital Markets (financial advisor); Honeywell (facilities manager)

Engineer: Entuitive (structural engineer and building envelope consultant)

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

Other: Aon (risk/insurance advisor to authority); BTY Group (lenders' technical advisor); Entro (signage and wayfinding); Ernst & Young (advising team); Infrastructure Ontario (procurement lead); WSP | MMM Group (geomatics and compliance); Mott MacDonald (facilities mgmt. advisor)

Funding: P3

This new 325,000-square-foot facility is being built on the site of the former Peel Memorial Hospital. The centre will accommodate outpatient care, including urgent care as well as day surgery; dialysis; diagnostic services; mental health and addictions services; senior wellness services; and family health services. When Peel Memorial is fully operational, it will have approximately 200 beds for the care of rehabilitation and complex continuing care patients. Construction began in the summer of 2014 on three levels of underground parking and is expected to be completed by summer 2016.

85

Milton District Hospital Expansion

\$512 million



NEW

Location: Milton, Ontario

Owner: Infrastructure Ontario and Halton Healthcare Services

DBFM Team: Plenary Health—Plenary Group (developer); PCL Constructors (constructor); B + H Architects and RTKL Associates (architect); RBC Capital Markets (financial advisor); Johnson Controls (facility manager)

Legal: Fasken Martineau DuMoulin (funders' representative); Gowling Lafleur Henderson
Other: Aon (risk/insurance advisor to authority); BTY Group (lenders' technical advisor and payment certifier); Ernst & Young (advising gvt.); Hanscomb (owner's design and construction stage cost consultant); Mott MacDonald (facilities management advisor to the authority); WSP (structural engineering services)

Funding: P3
• **Provincial** up to \$501.3 million
• **Municipal** Town of Milton: \$35 million

This project will add 330,000 square feet of space to the existing 125,000-square-foot hospital. Highlights include expansion of emergency and surgical services, medical/surgical inpatient units, critical care, maternal newborn, and diagnostic imaging and support services; and capacity increase from 63 to 129 inpatient beds. Construction is expected to be completed in spring 2017, followed by occupancy in the fall.

86

Wilson Facility Enhancement and Yard Expansion

\$506.4 million



2015 Rank: 88

Location: Toronto, Ontario

Owner: TTC

Construction Manager: Bondfield

Engineer: AECOM, Hatch, TTC


Contractor: Dufferin Construction, a division of CRH Canada (contract for prep work)

Supplier: Ansaldo; Canam Group; DECAST Ltd. (precast chambers); Dufferin Concrete; Nedco; Nortrak; Powell; Tomlinson; Thales; Twinco

Funding: Public
• **Municipal** TTC: \$5506.4 million (2015 Capital Budget)

TTC's Wilson Yard is undergoing a significant expansion of the rail yard and supporting maintenance. 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. Site services and track bed preparation for Stage 1, the storage tracks, is almost complete, and installation of the tracks has begun. Preparation for Stage 2, the run-around tracks, has been awarded, and all other systems contracts have been tendered. Systems installation will follow each stage of track installation completion. The entire project is expected to be completed by 2019.

87 Tazi Twé Hydroelectric Project

\$500 million 

NEW

Location: Elizabeth Falls, Saskatchewan

Owner: Black Lake First Nation in partnership with SaskPower

Project Manager: SaskPower

Engineer: KGS Group (engineering, design, and technical assessment)

Contractor: Peter Kiewit Infrastructure (general contractor)

Environmental Services: Golder Associates (environmental impact assessment)

Funding: Public
• **Provincial** SaskPower: \$500 million

The proponent has proposed the construction and operation of a 50-MW water-diversion-type electrical generating station at Elizabeth Falls. The proposed project would be located adjacent to the Fond du Lac River on the Black Lake Denesuline First Nation reserve land Chicken 224 between Black Lake and Middle Lake in northern Saskatchewan, approximately seven kilometres northeast of the community of Black Lake. It would involve the construction and operation of a water intake, a power tunnel, a powerhouse, a tail race, a submerged weir, a construction camp, a bridge, and access roads. In an EA decision statement in July 2015, the federal minister of the environment said the project was not likely to cause significant adverse environmental effects. The EA report states project construction would take approximately three years, from 2016 to 2019.

88 Nicolas-Riou Wind Project

\$500 million 

NEW

Location: Bas-Saint-Laurent Region, Quebec

Owner: EDF EN Canada (50 %), Énergie Éolienne Bas-St-Laurent (33.3 %), and Régie intermunicipale de l'énergie Gaspésie-Îles-de-la-Madeleine (16.7 %)

Turbine: Vestas **Other:** INTECH (insurance advisor) **Funding:** Private

Located in the Bas-Saint-Laurent region, on the private and public lands of TNO Boisbouscache and the municipalities of Sainte-Françoise, Saint-Mathieu-de-Riou, Saint-Médard (RCM Basques) and Saint-Eugène-de-Ladrière (RCM of Rimouski-Neigette), this 224.4-MW wind farm will be composed of 68 wind turbine generators. This project will count with around 400 workers on site during peak construction. In February 2015, Hydro-Québec Distribution awarded the project a 25-year power purchase agreement. Construction is planned to begin in spring 2016 and commissioning is expected to take place in December 2017.

89 Leslie Barns and Connection Track Project

\$497 million 

2015 Rank: 89

Location: Toronto, Ontario

Owner: TTC

Contractor: Pomerleau

Engineer: AECOM (prime consultant for architecture and engineering services); Gannett Fleming (industrial engineering sub)

Architect: Strasman Architects; Brown + Storey Architects; Scott Torrance Landscape Architect

Funding: Public
• **Municipal** TTC: \$497 million

The TTC is undertaking significant construction in the Leslie Corridor, including construction of Leslie Barns, a new streetcar maintenance and storage facility at the southeast corner of Lake Shore Boulevard and Leslie Street that will house about half of Toronto's new streetcar fleet and service all of the fleet; major upgrades to underground infrastructure on Leslie Street; construction of a streetcar track connection along Leslie Street that will connect Leslie Barns to the existing streetcar tracks on Queen Street; and streetscaping improvements. Council approved the project in 2009, and work began in 2010. The estimated completion date is Q2 2016.

90 Upper Lillooet Hydro Project

\$491.6 million 

2015 Rank: 97

Location: Pemberton Valley, British Columbia

Owner: Creek Power Inc.—Innergex Renewable Energy Inc. (66.67 %) and Ledcor Power Group (33.33 %)

Project Manager: Innergex Renewable Energy Inc.

Contractor: CRT Construction and EBC Inc. JV (main); Westpark Electric Ltd.

Financiers/Banks: The Manufacturers Life Insurance Company (agent and lead lender); Caisse de Dépôt et placement du Québec and the Canada Life Assurance Company (lenders)

Legal: McCarthy Tétrault (advising Creek Power)

Other: Hatch (lender's engineer); INTECH (insurance advisor); Lil'wat First Nation

Funding: Private

This hydro project includes two run-of-river generation facilities: the 81.4-MW Upper Lillooet River Hydroelectric Facility and the 25.3-MW Boulder (Pebble) Creek Hydroelectric Facility. Each facility will divert partial flows from the river through an intake structure directly to the turbines and generating equipment located in each powerhouse. The water will then be returned to each respective river and creek. A single, 230-kV transmission line will be constructed to connect the electricity generated to the BC Hydro grid. The project will deliver electricity on the basis of a 40-year electricity purchase agreement.

Site preparation has been completed at the two powerhouses, and access roads have been built. Both the downstream tunnel portal at Boulder Creek and the diversion channel at the Upper Lillooet intake structure are underway. The construction is scheduled from October 2013 to the end of 2016, when commercial operation is expected to commence.

91 Route 389 Improvement Program

\$468 million



2015 Rank: 96

Location: Baie-Comeau to the Labrador border, Quebec

Owner/Project Manager: Transports Québec

Project/Construction Manager: AECOM

Engineer: Dessau (transportation engineering, design, and specification); WSP (designer); SNC-Lavalin (engineering services)

Funding: Public

• **Provincial** Transports Québec: \$468 million

This 570-kilometre route is significant as the primary land route to Labrador as well as for access to the hydroelectric dams and power stations along the Manicougan River. The project involves resurfacing and other improvements to the highway, including building portions of new right-of-way road. The feasibility studies have been completed, environmental and geotechnical data has been gathered, and the needed measurements for the environmental studies and designs have been acquired. Transports Québec is communicating with the elective representatives, partners, and population to acknowledge their needs and opinions about the project. The EA is underway and the project is in the preparation stage.

92 Meikle Wind Energy Project

\$456 million



NEW

Location: Between Tumbler Ridge and Chetwynd, British Columbia

Owner: Pattern Energy

Engineer: WSP (collector network, substation, transmission line, feasibility study)

Contractor: Borea Construction; Duz Cho Construction (sub-contracted to build roads)

Turbine Supplier: GE Energy

Other: INTECH (insurance advisor)

Funding: Private

This 180-MW power project is the largest wind development in British Columbia. It will generate benefits for the province with an estimated \$70 million in payments for property taxes, Crown lease payments, wind participation rent, and community benefits over the first 25 years of operations. The project is utilizing 61 wind turbines and has a 25-year power purchase agreement with BC Hydro. The project also includes a single, two-way traffic access road from Highway 29 to the project site and connecting roads to access the turbines, a substation to convert power as required for transmission by BC Hydro, a four-kilometre transmission line to transfer power from the substation to the BC Hydro grid, a permanent operations building, and two permanent meteorological towers. The project was designed and planned incorporating input from First Nations, the Tumbler Ridge and Chetwynd communities, and the provincial government. The project received its environmental assessment certificate in June 2014. Construction will continue through November 2016 and is expected to be operational later that year.

93 Hanlan Water Project

\$450 million



2015 Rank: 94

Location: Mississauga, Ontario

Owner: Region of Peel

Engineer: CH2M (detailed design consultant: South Assignment—Contracts 1 & 2); WSP | MMM Group (detailed design consultants: North Assignment—Contract 3); The Municipal Infrastructure Group; GM Blueplan

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)

Environmental Services: AECOM (EA)

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

Other: AECOM (EA, preliminary design report); Arup (geotechnical engineering, tunnel design, pipeline and structural design support; Revay and Associates (project management support services); WSP (consultant and geotechnical)

Funding: Public

• **Municipal** Peel Region: \$330 million; York Region: \$120 million



Credit: Region of Peel

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 at Tomken Road and Britannia Road East. 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. As part of the York-Peel Water Agreement, Peel Region will provide water to York Region via the feedermain. In exchange, York Region will be funding 35.6 per cent of the feedermain costs. Both the feedermain and the subtransmission main are undergoing installation. Construction began in 2011 and is scheduled to be completed by early 2017.

94 Kicking Horse Canyon Project – Phase 4

\$450 million 

2015 Rank: 95

Location: Golden, British Columbia

Owner: British Columbia Ministry of Transportation and Infrastructure

Legal: McCarthy Tétrault

Funding: Public

This is a long-term project that involves upgrades, and a significant realignment of more than four kilometres of the Trans-Canada Highway through the Kicking Horse Canyon to improve traffic operations, safety, and reduce rock-fall hazards.

Phases 1, 2, and 3 are already complete, and Phase 4 will move ahead once a funding agreement is reached between the provincial and federal governments.

95 Canadian Forces Base Esquimalt A and B Jetty Recapitalization

\$430.6 million 

2015 Rank: 98

Location: Constance Cove, British Columbia

Owner: Department of National Defence

Contractor: Scansa Construction (utility corridor)

Other: Amec Foster Wheeler (design authority for Jetty A); BTY Group (cost consultant); Hanscomb (design engineer's cost consultant for Jetty A); Stantec (design authority for Jetty B)

Funding: Public

• **Federal** Department of National Defence: \$430.6 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. The project is expected to be completed by 2023.

96 Iqaluit International Airport Improvement Project

\$418.9 million 

NEW

Location: Iqaluit, Nunavut

Owner: Government of Nunavut

DBFOM Team: Arctic Infrastructure Partners—Stantec (design); Bouygues Building Canada, Sintra Inc., Kudlik Construction, and Tower Arctic (construction); Winnipeg Airports Authority (service provider); InfraRed Infrastructure Capital Partners, Bouygues Building Canada, ColasCanada, Winnipeg Airports Authority (equity investors)

Legal: Bennett Jones (acting for procuring authority); Miller Thomson (fairness advisor)

Other: Hanscomb (planning study/engineer's cost consultant); INTECH (insurance advisor); LeighFisher (ind. certifier); Partnerships BC (P3 process manager); SNC-Lavalin (ISO 9001 certification); WSP (external airport operations advisor)

Funding: P3

• **Federal** PPP Canada: \$72.8 million

• **Territorial** Government of Nunavut: \$68.7 million up front (remaining to be paid through availability payments)

Located in the capital city of Nunavut, the new Iqaluit International Airport will replace the original 1940 Frobisher Bay Air Force airport, and will continue to play a strategic technical support role for both military and civilian aviation. The project will include the construction of a new airport building, expanded aprons for planes to park, new lighting systems, an upgraded runway, and a new combined-services building that will house the fire-fighting vehicles/support equipment, and heavy runway and apron maintenance equipment. Once completed in 2017, it will address a host of safety and efficiency issues at the existing airport.

97 Saskatchewan Hospital North Battleford

\$407 million 

NEW

Location: North Battleford, Saskatchewan

Owner: Province of Saskatchewan and Prairie North Regional Health Authority

DBFM Team: Access Prairies Partnership—Graham Group, Carillion, Kasian Architecture Interior Design and Planning, WSP, and Entuitive

Engineer: Morrison Hershfield (civil eng., sustainability consultant, energy modelling)

Financiers/Banks: National Bank Financial (consortium's financial advisor)

Legal: Blake, Cassels & Graydon (counsel to successful proponent); Dentons Canada (legal advisor)

Other: Aon (risk/insurance advisor to authority); Ernst & Young (advising gvt.); INTECH (insurance advisor); Mott MacDonald (lenders' technical advisor)

Funding: P3

The new 284-bed Saskatchewan Hospital North Battleford will have 188 beds, replacing the existing 156-bed facility, and a 96-room secure unit for male and female offenders living with mental health issues. This is an innovative approach for delivering mental health care and supports two separate groups of people with significant psychiatric rehabilitation needs. Construction began in September 2015 and will be complete by spring 2018.



Credit: Government of Alberta

98 Royal Alberta Museum

\$375.5 million 

NEW

Location: Edmonton, Alberta

Owner: Government of Alberta

Contractor: Ledcor Design-Build (Alberta) Inc.—Ledcor, DIALOG, and Lundholm Associates Architects

Other: Hanscomb (owner's design stage cost consultant)

Funding: Public

- **Federal** Building Canada Fund: \$122.5 million
- **Provincial** \$253 million

This will be the largest museum in Western Canada. The new building provides double the exhibition space, creating more opportunities for visitors to interact with the museum and with each other. Installation of the structural steel is almost complete. Work is now underway to install interior partitions, the roofing, and glazing and stone panels to the exterior walls. In addition, the design team has been busy working with Royal Alberta Museum experts (and have engaged the city, project neighbours, and key stakeholders) to refine the design of the new museum, and museum staff are working on plans for the interior exhibit areas. Construction is projected for completion in 2016. Work to acclimatize the building and install the exhibits and collections will follow.

99 Joseph Brant Hospital Redevelopment and Expansion Project

\$353.6 million 

NEW

Location: Burlington, Ontario

Owner: Joseph Brant Hospital

DBF Team: Integrated Team Solutions—EllisDon (developer, design-builder); Fengate Capital Management (financial advisor), and Parkin/Adamson Architects (architects JV)

Legal: McCarthy Tétrault (lead counsel to IO and the hospital)

Other: Aon (risk/insurance advisor to authority); Ernst & Young (advising gvt.); Infrastructure Ontario (managing procurement and construction); INTECH (insurance advisor)

Funding: P3

- **Provincial** up to \$371.3 million
- **Municipal** City of Burlington: \$60 million
- **Private** Joseph Brant Hospital Foundation: \$60 million

This project involves the construction of a new seven-storey tower at Joseph Brant Hospital and a significant renovation in other areas of the hospital to give patients faster access to the right care. Through this expansion, patients will benefit from space for 172 additional beds in the new tower; additional beds in the intensive care unit; a modern emergency department; expanded diagnostic imaging services, which will provide capacity for an additional 23,745 exams per year; nine modern operating rooms and a post-anaesthetic care unit; an expanded cancer clinic; expanded ambulatory care programs; an expanded and modernized laboratory; and a renovated special care nursery. Construction is now underway and is expected to be complete in the fall of 2018.

100 Peter Gilgan Patient Care Tower

\$350.3 million 

NEW

Location: Toronto, Ontario

Owner: St. Michael's Hospital

DBF Team: Bondfield Construction

Consulting Architect: Diamond Schmitt Architects (concept design)

Supplier: Dufferin Concrete

Other: Engineering Harmonics (AV compliance consultant); Infrastructure Ontario

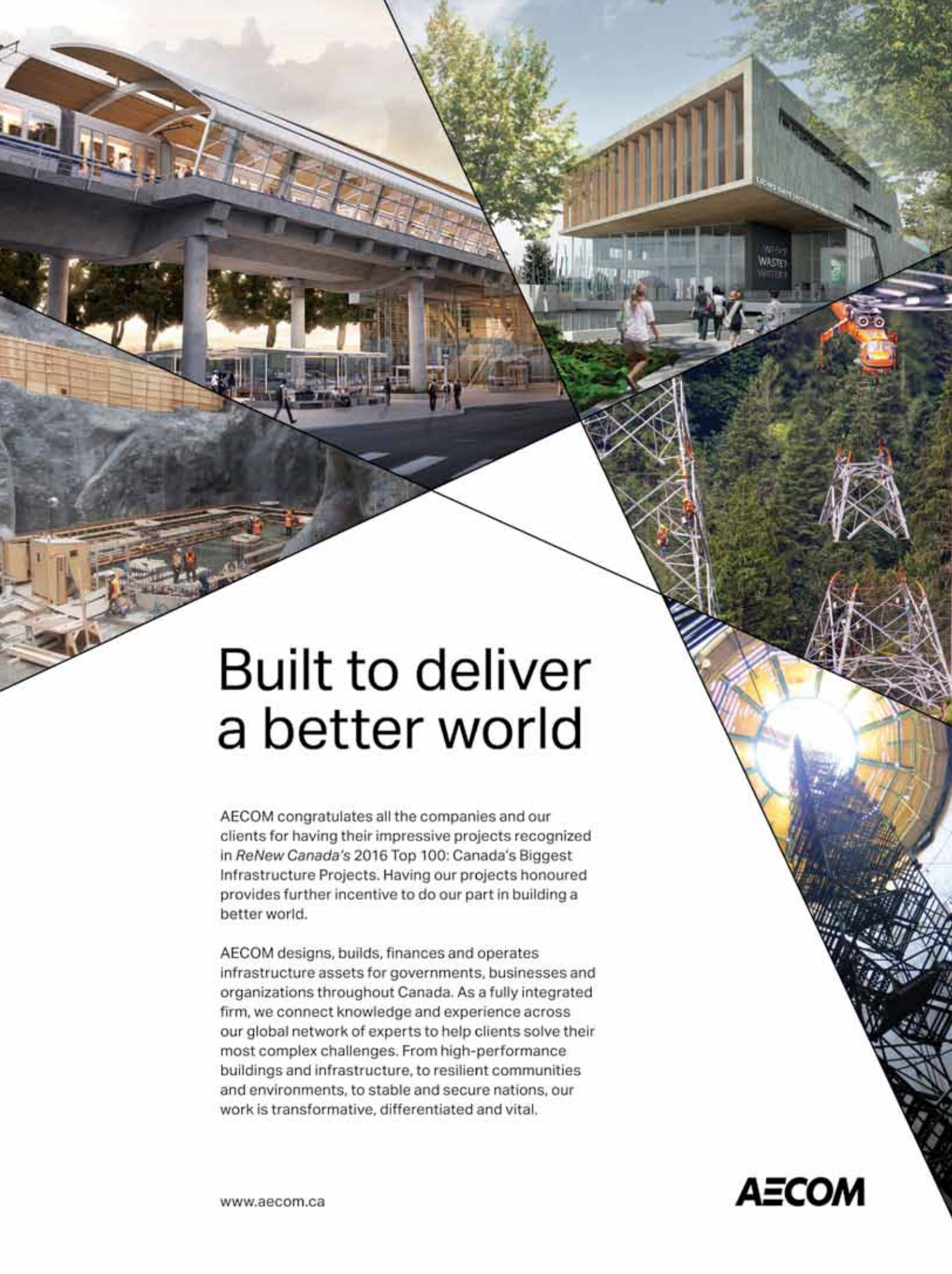
Funding: P3

- **Provincial** \$350.3 million

The project will include the construction of a new 17-storey patient care tower at the corner of Queen and Victoria streets, and the renovation of approximately 150,000 square feet of existing space. The tower, named for Peter Gilgan, founder and CEO of Mattamy Homes, will include five new purpose-built, state-of-the-art operating rooms designed to incorporate medical imaging equipment like MRIs, CT scanners, and X-rays, and two new intensive care units. Construction at St Michael's Hospital is now underway and is expected to be complete in 2019.

Financing

The aggregated AFP costs were put at \$350.3 million, with \$301.2 million in base construction costs.



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