

# Top 100

## Canada's Biggest Infrastructure Projects

**ReNew**  
CANADA  
The Infrastructure Magazine

# 2015

top100projects.ca



No. 72, Mosaic Stadium, Page 62





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# ReNew

CANADA  
The Infrastructure Magazine

## Top 100 Projects — 2015

An annual report inserted in  
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## List Value Increases 12%

ReNew Canada has produced the Top 100 report for the past nine years, and since its inaugural edition in 2007, the list has grown by leaps and bounds. (See page 45 for a look at total list value over the years.) This year, 25 newcomers—a quarter of the list with a total valued at \$33.1 billion—were welcomed to the list, taking the place of projects that were completed, changed scope, or were terminated in 2014.

The list has grown significantly over last year. This year, the country's 100 largest projects represent a total investment of \$157.9 billion, a 12-per-cent increase over 2014's \$140.5 billion. This can be attributed to the addition of multiple big-ticket mega-projects in transportation and energy.

The list is dominated by \$62.3 billion over 31 energy projects, with hydroelectric generation developments across the entire country claiming the Top 4 spots: Site C in British Columbia (\$8.775 billion), Muskrat Falls in Manitoba (\$6.99 billion), the Romaine Complex in Quebec (\$6.5 billion), and Keeyask in Ontario (\$6.5 billion). Across all energy sectors, the list represents 18,208 MW in new or refurbished generation potential.

In second place, transportation represented \$38.8 billion over 21 projects, and \$12.9 billion is new to 2015, which is far and away the largest monetary increase from last year's report. This is due to giant Western Canadian road projects currently in the planning stage, such as the \$5-billion Southwest Calgary Ring Road (No. 7) in Alberta and the \$3-billion George Massey Tunnel Replacement Project (No. 12) from Delta to Richmond, British Columbia.

The rest of list includes 17 transit projects (\$27.6 billion), 21 buildings (\$20.3 billion), five water and wastewater developments (\$3.1 billion), two each of carbon capture (\$2.6 billion) and remediation (\$2.2 billion) projects, and one waste management project (\$1 billion).

Of course, by "top," we simply means most expensive. 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](mailto:top100@actualmedia.ca) or visit [top100projects.ca/submit-a-project](http://top100projects.ca/submit-a-project).

**André Voshart**  
Editor, ReNew Canada



To create your own report, visit [top100projects.ca/2015filters](http://top100projects.ca/2015filters) and sort by project cost, key players, location, sector, and more.

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## Top 100 Project Index

By Rank, Project Title, and Page Reference

**Buildings**

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

**Health Care**

71	BC Children & Women's Hospital/Health Centre Redevelopment	61
16	CHUM (Centre hospitalier de l'université de Montréal) Redevelopment	26
74	Grande Prairie Regional Hospital	62
27	Humber River Regional Hospital	34
99	Jewish General Hospital – Pavilion K	70
41	New Cancer Centre in Calgary	45
81	New Hospital in Corner Brook	65
13	New Oakville Hospital	22
77	North Island Hospitals Project	64
90	Peel Memorial Centre for Integrated Health and Wellness	67
60	Providence Care Hospital	56
53	Sainte-Justine University Hospital Centre	53
91	Women's College Hospital Redevelopment	68

**Military**

98	Canadian Forces Base Esquimalt A and B Jetty Recapitalization Project	70
56	Canadian Forces Base Trenton Expansion	55

**Public Spaces**

22	45-141 Bay Street	30
62	Union Station Revitalization Project	57

**Social Infrastructure**

86	CIBC Pan Am and Parapan Am Athletes' Village	66
72	Mosaic Stadium	62
100	Quebecor Arena	70
76	Rogers Place Arena Project	64

**Energy**

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

**Coal**

33	H.R. Milner Coal Plant Expansion	41
----	----------------------------------	----

**Hydroelectric**

78	Gordon M. Shrum Generating Station Refurbishment	64
47	John Hart Generating Station Replacement Project	48
4	Keeyask Hydroelectric Project	14
15	Lower Mattagami River Project	24
69	Marmora Pumped Storage Project	61
65	Mica Generating Station Upgrade	59
2	Muskrat Falls Project	12
82	Pointe du Bois Spillway Replacement Project	65
29	Renovations to Beauharnois Generating Station	35
3	Romaine Complex	13
64	Ruskin Dam and Powerhouse Upgrade	58
1	Site C Clean Energy Project	10
55	The Waneta Expansion	54
97	Upper Lillooet Hydro Project	69

**Natural Gas**

34	Great Spirit Power Project	41
85	Queen Elizabeth Power Station Expansion	66
36	Shepard Energy Centre	42

**Nuclear**

17	Darlington Refurbishment Project – Definition Phase	26
----	---	----

**Transmission**

8	Bipole III Transmission Line	18
39	Chamouchouane–Bout-de-l'Île Transmission Line	44
31	Fort McMurray West Transmission Project	40
66	Interior to Lower Mainland Transmission Project	59
73	Juan de Fuca Power Cable	62
32	Maritime Link Project	40
79	Ontario East-West Transmission Tie	64
45	Romaine Complex Transmission Line	47
28	Western Alberta Transmission Line	34

**Wind**

83	Armow Wind Project	65
57	K2 Wind Project	55
61	Rivière du Moulin Wind Farm	57

**Other**

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

**Carbon Capture**

44	Alberta Carbon Trunk Line	46
38	Quest Carbon Capture and Storage Project	44

**Remediation**

54	Giant Mine Remediation Project	54
42	Port Hope Area Initiative	46

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- » York VIVA Bus Rapid Transit (vivaNext)
- » Confederation Line
- » Calgary International Airport Developments
- » New Oakville Hospital
- » CIBC Pan Am and Parapan Am Athletes' Village
- » Providence Care Hospital

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## Top 100 Project Index (continued)

By Rank, Project Title, and Page Reference

## Waste Management

49	Deep Geologic Repository	50
----	--------------------------	----

## Water-Wastewater

94	Hanlan Water Project	69
68	Lions Gate Secondary Wastewater Treatment Plant	60
75	Regina Wastewater Treatment Plant	62
63	Seaterra Program	58
84	Southeast Collector Trunk Sewer	66

## Transit

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

## BRT

80	Winnipeg Capital Integration Project	65
37	York VIVA Bus Rapid Transit (vivaNext)	42

## LRT

20	Confederation Line	28
25	Edmonton Valley Line – Stage 1	32
5	Eglinton Crosstown LRT	14
35	Evergreen Line Rapid Transit Line	41
50	Finch West LRT	50
30	Hurontario-Main LRT	35
59	ION Region of Waterloo LRT – Stage 1	56
51	Sheppard East LRT	52
93	Union-Pearson Express Spur Line	68

## Rail

89	Leslie Barns and Connection Track Project	67
67	Union Station Infrastructure Renewal Program	60

## Subway

18	Montreal Metro Car Replacement	27
11	Scarborough Subway Extension	20
14	Spadina Subway Extension	23
88	Wilson Facility Enhancement and Yard Expansion	67

## Transportation

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

## Airport

21	Calgary International Airport Development Project	28
26	Vancouver International Airport Upgrades	34

## Bridge

12	George Massey Tunnel Replacement Project	20
6	New Bridge for the St. Lawrence Corridor Project	16
19	New International Trade Crossing	27

## Highway

87	Dorval Interchange	67
46	East Side Transportation Initiative	47
92	Extension of Autoroute 35	68
48	Highway 407 East Extension – Phase 1	48
43	Highway 63 Twinning Program	46
95	Kicking Horse Canyon Project – Phase 4	69
24	Northeast Anthony Henday Drive	32
10	Port Mann Bridge/Highway 1 Improvements	20

52	Regina Bypass Project	52
40	Route 185 Widening	45
96	Route 389 Improvement Program	69
7	Southwest Calgary Ring Road	16
70	Trans Labrador Highway Widening and Hard Surfacing	61
9	Turcot Interchange	18

## Port

58	Fairview Container Terminal (Prince Rupert Container Terminal Expansion)	56
23	Roberts Bank Terminal 2 Project	30

## Figures

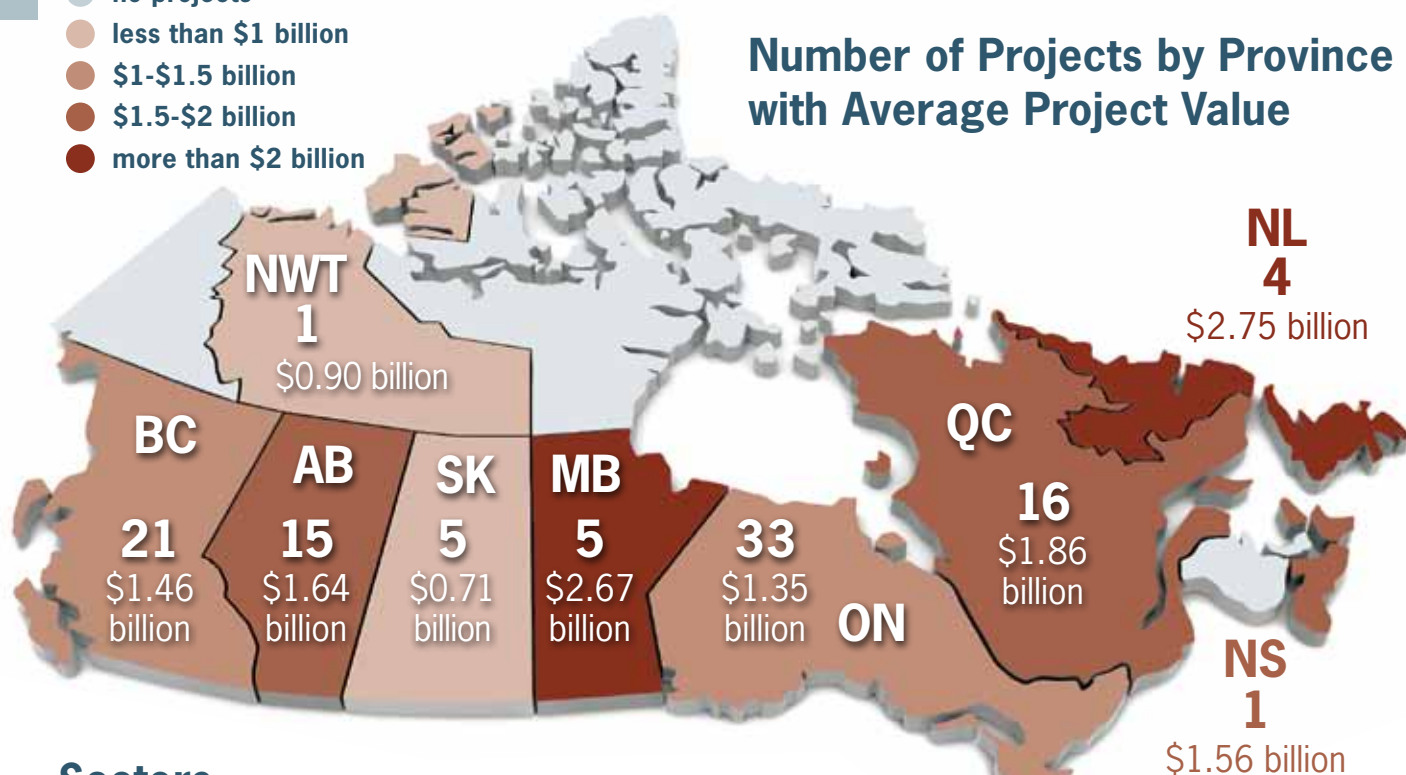
	page #
Projects & Sectors by Province	8
Projects by Sector	8
Total Investment	36
Projects by Year of Completion	36
Energy Development in Canada	40
A Look Back at the Top 100	45
Project Delivery	50
Health Care Breakdown	52
Transit Expansion	54
Transportation Development	58

## Acronym Legend

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

- no projects
- less than \$1 billion
- \$1-\$1.5 billion
- \$1.5-\$2 billion
- more than \$2 billion

## Number of Projects by Province with Average Project Value



## Sectors by Province

	BC	AB	SK	MB	ON	QC	NS	NL	NWT
Energy	9	5	1	3	6	5	1	2	
Buildings	3	3	1		9	4		1	
Transit	1	1		1	13	1			
Transportation	6	4	1	1	2	6		1	
Other	2	2	1		4				1

## Projects by Sector

(Cross-sector projects counted more than once)

### Energy

Hydroelectric 14	Transmission 9	Natural Gas 3	Wind 3	Coal 1	Nuclear 1
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### Transit

LRT 9	Subway 4	BRT 2	Rail 2
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### Buildings

Health Care 13	Social Infrastructure 4	Military 2	Public Spaces 2
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### Transportation

Highway 14	Bridge 3	Airport 2	Port 2
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### Other

Water/Wastewater 5	Carbon Capture 2	Remediation 2	Waste Management 1
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North Island Hospitals Project



Credit: BC Hydro

1

## Site C Clean Energy Project

**\$8.775 billion** 

**2014 Rank:** 1

**Location:** Near Fort St. John, British Columbia

**Owner:** BC Hydro

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

**Environmental Services:** Golder Associates Ltd., Pathfinder Endeavours Ltd., Keystone Wildlife Research Ltd., McMillen, RWDI Air Inc., Knight Piésold, and Industrial Forestry Service Ltd. (environmental and regulatory work)

**Other:** MMM Group (Highway 29 relocation work); Dentons Canada LLP (owner's counsel)

**Funding:** Public

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

## Financing

The project's core budget is now \$8.335 billion, with an additional \$440 million reserve account for unexpected costs during the eight-year construction schedule. The project's costs have escalated more than \$800 million above last year's \$7.9 billion budget.

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-km-long reservoir, realignment of six sections of Highway 29, and two 77-km 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 (EA) was completed in October 2014 and approval granted after numerous consultation meetings, presentations, and events with the public, Aboriginal groups, and local governments. Preliminary engineering work has been done, including the development of plans for construction access roads, clearing plans, construction materials, geotechnical shoreline investigations, and reviews of highway realignment plans.

In December 2014, the B.C. government approved the dam and released an updated project cost. The project, which has undergone a multi-year environmental assessment process, will start its eight-year construction in summer 2015.

# Challenging the status quo in Infrastructure and PPP.

Congratulations to our clients on their inclusion in the 2015 Top 100 Infrastructure Projects in Canada.

- Site C Clean Energy Project
- New Bridge for the St. Lawrence
- New International Trade Crossing
- Turcot Interchange
- Muskrat Falls Project

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\*Acritas Global Elite Law Firm Brand Index 2013 and 2014.





Credit: Nalcor Energy

## 2 Muskrat Falls Project \$6.99 billion

**2014 Rank:** 12 and 19 (now combined)

**Location:** Muskrat Falls, Newfoundland and Labrador

**Owner:** Nalcor Energy (with Emera Inc. partnership interest in the Labrador–Island Link)

**Engineer:** Nalcor Energy, SNC-Lavalin

**Contractor:** Astaldi Canada (hydroelectric generating facility—construction of an intake, powerhouse, spillway, and transition dams); Valard Construction (transmission)

**Financiers:** TD Securities and Goldman Sachs as co-lead arrangers (who along with a syndicate of financial institutions—including BMO Nesbitt Burns, CIBC World Markets, RBC Dominion Securities, Scotia Capital, HSBC, Bank of America Merrill Lynch, Beacon Securities, Casgrain & Company, Desjardins Securities, Laurentian Bank, and National Bank Financial—proceeded to raise \$5 billion through the debt capital markets)

**Other:** IKC-ONE—Innu Kiewit Constructors, H.J. O’Connell, Neilson, and EBC (rock and overburden excavation); Hatch (engineering services); Golder Associates; Morrison Hershfield and IDDEL (sub to Astaldi); Lafarge and Holcim Canada (cement); Hatch Mott MacDonald (transmission—feasibility studies, design services)

**Legal:** McCarthy Tétrault LLP (TD Securities and Goldman Sachs); Fasken Martineau DuMoulin LLP (advising sponsor); Dentons Canada LLP (construction contractor’s counsel); Gowling Lafleur Henderson LLP (regulatory counsel to Emera)

**Funding:** Public/Private

## Financing

Funding for the project is derived from (a) \$5 billion in Government of Canada guaranteed, long term bonds issued in the public debt markets in December 2013; (b) equity contributions from the Government of Newfoundland & Labrador; and (c) equity contributions from Emera relating to their partnership interest in the Labrador–Island Link.

The projects were sanctioned in December 2012 with direct facilities capital cost of \$6.2 billion plus financing costs to be capitalized during the period up to in-service. 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 :

- Muskrat Falls Hydroelectric Generating Facility: \$3.372 billion
- Labrador–Island Link: \$2.786 billion
- Transmission Assets: \$832 million

Nalcor Energy leads the development of the Muskrat Falls Project, which includes construction of an 824-MW hydroelectric generating facility at Muskrat Falls on the lower Churchill River in Labrador and more than 1,500 km 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. Drilling work for the Strait of Belle Isle marine cable crossing was completed in August 2014. Contracts are in place for the majority of work, and almost all major contracts will be awarded by the end of 2014.

Credit: Hydro-Québec



### 3

## Romaine Complex

**\$6.5 billion** 

**2014 Rank:** 2

**Location:** Havre-Saint-Pierre, Quebec

**Owner:** Hydro-Québec

**Engineer:** Romaine-1: AECOM

Romaine-2: Groupe RSW and SNC-Lavalin

Romaine-3: AECOM

**Contractor:** Romaine-1: Hamel-CRT, Cegerco, Cegerco-Gilbert, Groupe Hexagone, Pomerleau, a consortium of J. Euclide Perron and Inter-cité Construction

Romaine-2: 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, Thirau, Couillard Construction, Groupe Hexagone

**Other:** WSP (EA and access roads)

**Turbine Supplier:** Romaine-1: Voith Hydro  
Romaine-2 and 3: Alstom (turbine-generator unit)

**Supplier:** Holcim Canada (cement)

**Funding:** Public

• **Provincial** Hydro-Quebec: \$6.5 billion

This 1,550-MW hydroelectric complex on the Romaine River is still on track for completion in 2020. It involves four generating stations and reservoirs spaced over 150 km along the North Shore of the Gulf of St. Lawrence. Each station will have an associated rockfill dam, two or three generating units, and a spillway. Two access roads will also be built as part of the project, one 10 km in length linking to Romaine-1, and one 150 km to Romaine-4.

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 more than 2,000 workers from 2012 to 2016. Hydro-Québec continues to be committed to renewable energy sources for this project, as well as local job creation.

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.

## Timeline: Romaine Complex



## 4 Keeyask Hydroelectric Project

**\$6.5 billion** 

**2014 Rank:** 3

**Location:** Lower Nelson River, Manitoba

**Owner:** Keeyask Hydropower Limited Partnership

**Engineer:** SNC-Lavalin; Hatch (EP contract); KGS Group; AECOM; Hatch Mott MacDonald (supporting Hatch)

**Contractor:** BBE Hydro Constructors Ltd. (general civil contractor); JV with Bechtel, Barnard and EllisDon (general contractor)

**Other:** Golder Associates (information management solution services)

**Legal:** Fasken Martineau DuMoulin LLP (advised Manitoba Hydro)

**Funding:** Public

- **Provincial/First Nations** Keeyask Hydropower Limited Partnership (co-owned by Manitoba Hydro and Keeyask Cree Nations): \$6.5 billion

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. 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.

As of July 2014, all regulatory and environmental approvals and permits have been received, and construction on the station itself began on July 16. Work continues on the project's main camp, which will be completed in the fall of 2014. The station's first unit is scheduled to go into service in 2019, with all units commissioned by 2020.

## 5 Eglinton Crosstown LRT

**\$5.3 billion** 

**2014 Rank:** 5

**Location:** Toronto, Ontario

**Owner:** Metrolinx

**Project/Construction Manager:** Metrolinx; 4 Transit—Parsons (previously Delcan), Hatch Mott MacDonald, and MMM Group

**Engineer:** CH2M Hill (owner's engineer); Arup (fire vent, Keele and Caledonia station—preliminary design); URS/Parsons JV (systems design); Parsons Brinckerhoff (program management); Halsall (structural engineers, sustainability consultants)

**Contractor:** Aecon, Dragados Canada, James Elliott Underground, Kenaidan Contracting Ltd.

**Other:** AECOM, Parsons (previously Delcan), Golder Associates, Entro, exp Services

**Architect:** Kleinfeldt Mychajlowycz Architects Inc.; Scott Torrance Landscape Architect; JHDR (Eglinton-Yonge interchange station)

**Tunnel Boring Machine Supplier:** Caterpillar

**Vehicle Supplier:** Bombardier

**Supplier:** Munro; Dufferin Concrete and Ontario RediMix (concrete)

**Funding:** P3

- **Provincial** Ministry of Transportation capital allotment to Metrolinx: \$5.3 billion

This LRT line will run along Toronto's Eglinton Avenue between Mount Dennis (Weston Road) and Kennedy Station. Part of the Government of Ontario's light transit plan for the city, this 19-km corridor will include a 10-km underground portion between Keele Street and Laird Drive. When running at street level, the Crosstown 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.

A successful P3 team will be announced this year, and construction is estimated to be completed by 2020.

## Financing

The Crosstown stations, tracks, signalization, and maintenance facility will be delivered by Metrolinx, together with Infrastructure Ontario, using the AFP model. The DBFM contract was to be awarded in late 2014.

As well, the Government of Ontario announced in fall 2014 it would begin issuing green bonds to help finance transit and other environmentally friendly development projects. The Crosstown project will be the first to receive such funding, which will likely be up to \$500 million.

# PARSONS



Calgary Airport Runway, Calgary, Canada

Photo Credit: Multivista Photos



Spadina Subway Extension, Toronto-York Region, Canada



vivaNext, York Region, Canada



Highway 407 Electronic Toll Road, Toronto, Canada

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Credit: WSP

6

## New Bridge for the St. Lawrence



\$5 billion

**2014 Rank:** 4

**Location:** Montreal to Brossard, Quebec

**Owner:** Government of Canada/Infrastructure Canada

**Engineer:** IBI/Roche (electrical), Groupe SMi International, and Arup Canada (engineering advisory services during preparation of RFP); Morrison Hershfield

**Other:** PricewaterhouseCoopers; Steer Davies Gleave; Dessau/CIMA + ; LVM; Consortium Perron, Hudon, Bélanger and Consultants (advisory services to the Government of Canada)

**Legal:** Dentons Canada LLP (owner's counsel); McCarthy Tétrault LLP

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

**Funding:** P3

## Financing

In July 2014, three consortia were invited to participate in the request for proposals.

- Saint-Laurent Alliance—WSP Canada, Buckland & Taylor, Kiewit, Macquarie Capital Group, Skanska Infrastructure Development, Aecon, Skanska Canadian Construction Services, and Parsons Brinckerhoff Halsall
- St. Lawrence New Bridge Partnership—OHL Infrastructure, DIF Infra 3 Canada, Acciona, Samsung, OHL Construction Canada, Hatch Mott MacDonald, Dessau, Ramboll Denmark A/S, and Mainroad Holdings
- St. Lawrence Group—SNC-Lavalin, ACS Infrastructure Canada, HOCHTIEF, Dragados Canada, Flatiron, MMM Group, T.Y. Lin International, and International Bridge Technologies Canada

The selected consortium will be announced in April 2015.

The yet-unnamed New Bridge for the St. Lawrence will replace Montreal's 3.4-km Champlain Bridge, the country's busiest and most economically significant water crossing. Increased traffic and road salt have contributed to the deterioration of the current bridge, built more than five decades ago. This project will also include the replacement of the Île des Sœurs Bridge, the reconstruction of the 2-km federal portion of autoroute 15, and the realignment of roads and access ramps on Île des Sœurs and the South Shore. The project cost will be in the range of \$3 billion and \$5 billion.

In December 2013, the government announced a new accelerated timeline for the project, with construction set to begin in summer 2015. The government is committed to having the new bridge in service in 2018 and the remainder of the corridor completed by 2020.

7

## Southwest Calgary Ring Road



\$5 billion\*

**NEW**

**Location:** Calgary, Alberta

**Owner:** Alberta Transportation

**Other:** WSP/Focus (functional planning and preliminary engineering services)

**Legal:** Gowling Lafleur Henderson LLP (counsel to Alberta Transportation)

**Funding:** Public

• **Provincial** Alberta Transportation: \$5 billion

At the end of 2013, a historic land transfer agreement was reached between the Alberta government and the Tsuu T'ina Nation, allowing the government to purchase lands from the Tsuu T'ina Nation in order to complete the road. The 16-km southwest section of Calgary Ring Road will run from east of 69 Street SW on Glenmore Trail south to Macleod Trail (Highway 2A). The project will also include approximately 10 km 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, with the west section to follow in about two years' time. The province anticipates having shovels in the ground by early 2016, and the hope is that the route will be completed by 2020.

*\*This \$5-billion figure is based on reported estimates. The true cost of the project will be unreleased until contract estimates are received.*

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8

**Bipole III Transmission Line****\$4.6 billion****2014 Rank:** 9**Location:** Winnipeg, Manitoba**Owner:** Manitoba Hydro**Engineer:** Teshmont Consultants (owner's engineer on converter stations); Stantec Consultants (converter station civil design); Sigfasson Northern (Keewatinoow civil site development)**Contractor:** Siemens Canada and Mortenson Canada (design, supply, and install the high-voltage direct current equipment and buildings)**Other:** North/South Consultants (environmental consulting); CMC Consultants (initial routing study); Joro Consultants and Wildlife Resources Consulting Services (wildlife impact consulting); MMM Group (geomatics services)**Legal:** Fasken Martineau DuMoulin LLP (represented Manitoba Hydro)**Supplier:** Outland Camps (Keewatinoow camp supply); SNC-Lavalin (Keewatinoow switchyard supply)**Funding:** Public• **Provincial** Manitoba Hydro: \$4.6 billion

More than 70 per cent of Manitoba's 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 Keewatinoow Converter Station down to Riel Converter station, to be located near Winnipeg. The preferred route is approximately 1,384 km in length. 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 proposed Keeyask Generating Station, No. 4 on this list).

Construction began in 2013 with civil site preparation for the Keewatinoow station, construction power, clearing of northern components of transmission lines, and installation of foundations, as well as continued development of the Keewatinoow Camp. Construction power was put into service in July 2014, and the contract to design, supply, and install equipment and buildings for the two converter stations was signed in October 2014. 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 Bipole III Project up from the preliminary estimate of \$3.28 billion. 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.

9

**Turcot Interchange****\$3.7 billion****2014 Rank:** 7**Location:** Montreal, Quebec**Owner:** Transports Québec**Project/Construction Manager:** AECOM and BPR-Batiment**Engineer:** SNC-Lavalin (preliminary design services), CIMA + (feasibility study); LVM (environmental, geotechnical, and materials engineering); MMM Group (independent engineer)**Contractor:** KPH-Turcot (design-build)—Kiewit, Parsons, Holcim Canada, WSP**Other:** WSP (designer, environmental); Arup (technical advisor, independent certifier)**Legal:** Dentons Canada LLP (owner's counsel)**Funding:** Public• **Provincial:** \$3.7 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. A corridor will be reserved along Notre Dame and St. Ambroise streets for a possible future LRT, and several bus-only lanes have been reserved along Highway 20, Notre Dame Street West, and St. Patrick Street.

Construction of a public transit bypass at Notre Dame and Angrignon Boulevard West has been completed to minimize the impact of the Turcot Interchange reconstruction.

In December 2014, the Quebec government awarded the contract to rebuild the interchange. When the bidding process was announced, the government said construction would begin in 2015 and wrap up by 2020.



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## 10 Port Mann Bridge/Highway 1 Improvements

**\$3.3 billion** 

**2014 Rank:** 8

**Location:** Vancouver to Langley, British Columbia

**Owner:** Province of British Columbia

**Engineer:** Delcan (program engineer); MMM Group, Golder Associates, CH2M HILL (subconsultants to Delcan); H5M—JV of Hatch Mott MacDonald and MMM Group (prime design consultants—onshore works); T.Y. Lin International (prime design consultant—New Concession Bridge)

**Contractor:** Kiewit-Flatiron General Partnership (design-build)—Peter Kiewit Sons Co. and Flatiron Constructors Canada

**Other:** Partnerships BC (procurement manager and project developer)

**Funding:** P3

• **Provincial** \$3.3 billion

This project involves replacing the dominant Port Mann Bridge across the Fraser River, widening 37 km of the highway through the eastern suburbs of Vancouver, reconstructing 11 interchanges, constructing or rehabilitating 42 on-shore bridges, and rebuilding the Cape Horn-Lougheed Highway Interchange. The project also includes construction of the new Fraser Heights Connector to link Highway 1 with the recently completed Golden Ears Crossing and the recently completed South Fraser Perimeter Road.

Construction of the bridge's final two lanes and connections to highway 1 were expected to finish in 2014, but weather-related difficulties have pushed finishing work into early 2015.

## 11 Scarborough Subway Extension

**\$3.3 billion** 

**2014 Rank:** 13

**Location:** Toronto, Ontario

**Owner:** TTC

**Engineer:** SNC-Lavalin; Parsons Brinckerhoff (design standards consultant)

**Other:** AECOM (environmental assessment)

**Funding:** P3

- **Federal** Building Canada Fund: \$660 million
- **Provincial** \$1.48 billion  
(TTC looks to boost the provincial share)
- **Municipal** TTC: \$990 million  
(\$165 million, development charges;  
\$745 million, property tax)

## Financing

In the process of selecting a partner to construct and maintain the system through the AFP process.

This subway extension will extend the Bloor-Danforth subway line approximately 7.6 km from Kennedy Station to Sheppard Avenue and McCowan Road.

An EA contract has been awarded, which will include determining the route and where and how many stations there will be. The selection of a partner to construct and maintain the system through the AFP process is underway.

TTC has also 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 acquiring/retrofitting tunnel boring machines. Then, from 2018 to 2023, the line will undergo construction.

## 12 George Massey Tunnel Replacement Project

**\$3 billion** 

**NEW**

**Location:** Delta to Richmond, British Columbia

**Owner:** British Columbia Ministry of Transportation and Infrastructure

**Engineer:** MMM Group (owner's engineer)

**Environmental Services:** Hemmera (supporting project planning and leading the EA); Levelton Consultants Ltd. (air quality, climate change assessment)

**Funding:** Public

## Financing

All potential financing options are on the table until the scope of the project is confirmed.

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. British Columbia has committed to constructing a replacement tunnel as the current one has only about 10 years of life remaining. The replacement project will replace the existing 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. Subject to environmental review, construction is expected to begin in 2017, to ensure Highway 99 continues to meet the growing needs of communities, businesses and, stakeholders that rely on this crossing. Design refinements and consultation are in progress.



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Credit: EllisDon

## 13 New Oakville Hospital

**\$2.7 billion**



**2014 Rank:** 45

**Location:** Oakville, Ontario

**Owner:** Halton Health Services

**DBFM Team:** Hospital Infrastructure Partners—Carillion Canada, EllisDon, Fengate Capital Management

**Contractor:** EllisDon and Carillion Construction (construction)

**Financiers/Banks:** Scotia Capital (financial advisor); National Bank (bond underwriter/mandated lead arranger bank facility)

**Legal:** McCarthy Tétrault LLP (advised Infrastructure Ontario and Halton Healthcare); McMillan LLP (repped Hospital Infrastructure Partners); Stikeman Elliott LLP (repped lenders); Gowling Lafleur Henderson LLP

**Architect:** A JV of Parkin Architects and Adamson Associates Architects

**Supplier:** Honeywell (integrated building management system, technology solutions provider); Canam (steel joists); Dufferin Concrete

**Other:** Infrastructure Ontario (procurement manager and project development); WSP (heliport planning)

**Funding:** P3

- **Municipal** Halton Healthcare Services: \$270 million (± 15 %)
- **Town of Oakville:** up to \$130 million
- **Private** Oakville Hospital Foundation: \$60 million

## Financing

The value of the contract with Hospital Infrastructure Partners in today's dollars is approximately \$2 billion. Over the 30-year life of the contract, when adjustments for anticipated inflation are made, the contract value is \$2.7 billion (nominal), covering the design and construction of the facility, building maintenance, life-cycle repair and renewal, and project financing.

This new hospital facility involves the construction of approximately 1.6 million square feet on a 50-acre greenfield parcel of land at Third Line and Dundas Street, and it will replace the existing Oakville-Trafalgar Memorial Hospital and provide state-of-the-art healthcare services for the surrounding area.

The facility, targeting LEED Silver, will have built-to capacity for 457 beds with additional shell space to allow for future growth to 602 beds. The facility buildings include three main sections: a five-storey section for complex continuing care and rehabilitation that will also house a number of outpatient programs like nephrology and includes the mechanical penthouse on the fifth floor; a 10-storey inpatient tower section containing patient bedrooms, operating theatres, as well as pre- and post-operative support functions; and a four-storey therapeutic and diagnostic imaging section that houses emergency care, diagnostic imaging, ambulatory clinics, maternal/child services, adult mental health, and two floors for the mechanical electrical penthouse. A fourth section serves as the two-storey main hospital entrance and lobby and connects the rehabilitation block to the inpatient tower block.

Ground was broken in summer 2011, with concrete foundations poured in 2012. The facility is more than 75-per-cent complete as the project heads toward substantial completion on July 31, 2015. The hospital will open to the public in December 2015.

Credit: Aedas



## 14 Spadina Subway Extension

**\$2.63 billion** 

**2014 Rank:** 14

**Location:** Toronto, Ontario

**Owner:** TTC

**Project/Construction Manager:** Spadina Link Project Managers, a JV between Hatch Mott MacDonald, Parsons (formerly Delcan), and MMM Group (project management consultants); Morrison Hershfield Ltd. (construction management); Parsons Brinckerhoff (program management)

**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); Halsall (structural engineer/sustainability consultant)

**Contractor:** Walsh Group (Steeles West station construction); Bondfield Construction; EllisDon (York University station); Carillion Construction; Obrascon Huarte Lain (OHL) in JV with Fomento de Construcciones y Contratas (FCC) (north tunnels and Highway 407 station); Aecon (construction); Dufferin Construction (Agincourt grade separation); JV of McNally International, Kiewit, and Aecon (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)

**Other:** Hatch Mott MacDonald (tunnel design); Arup, in assoc. with Grimshaw Architects, Adamson Associates Architects, and Foster + Partners (York University and Vaughan Metropolitan Centre 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)

**Legal:** McCarthy Tétrault LLP  
(York University sponsor)

**Architect:** Aedas (Sheppard West station); JV of IBI Group Architects, LEA Consulting, and Halsall in assoc. with Will Alsop (Finch West and Steeles West stations)

**Supplier:** Caterpillar Tunneling

**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: \$526 million  
York Region: \$352 million

This is the largest subway expansion project to be undertaken by the Toronto Transit Commission (TTC) since the Bloor–Danforth subway line was built 48 years ago. The subway network will link Toronto with communities in York Region. The 8.6-km extension to the existing Spadina line will include six new stations: Downsview Park, Finch West, York University, Pioneer Village at North West Gate and Steeles Avenue, Highway 407, and the Vaughan Metropolitan Centre.

Construction work on the Highway 407 station is progressing with the south tunnel completed and construction of the north tunnel soon to commence. Service is expected to begin in late 2016.



Credit: AECOM

## 15 Lower Mattagami River Project

**\$2.6 billion** 

**2014 Rank:** 15

**Location:** Northeast of Kapuskasing, Ontario

**Owner:** Ontario Power Generation and Moose Cree First Nation

**Engineer:** AECOM (civil, mechanical, electrical); Aecon (design); Hatch (owner's rep); SNC-Lavalin; Levelton Consultants Ltd. (materials engineering on behalf of contractor)

**Contractor:** The Kiewit Alarie Partnership—Kiewit, Leo Alarie and Sons Construction, a subsidiary of Aecon (construction); SNC-Lavalin (design build)

**Architect:** AECOM

**Turbine Supplier:** Alston (hydro turbine generators); Andritz Hydro

**Other:** Sodexo; Allied Fabricators; Groupe Canmec; MMM Group (LEED, energy, and commissioning, generating station at Smoky Falls)

**Funding:** Public

• **Provincial** \$2.6 billion

## Financing

In August 2010, a \$700 million bank credit facility was established to support initial construction for the project. Additional financing arrangements are being established. A long-term Hydroelectric Energy Supply Agreement (HESA) contract has also been negotiated between OPG and the Ontario Power Authority.

This project is the largest investment in hydroelectric power in Northern Ontario in nearly 40 years. It has four components, which include the rebuilding of the Smoky Falls Generating Station as well as the addition of new generating units at the Harmon, Kipling, and Little Long generating stations. By the time work is completed, the capacity of the Lower Mattagami plants will have increased to 924 from 486 MW.

Smoky Falls was originally constructed in 1931, while the others were built in the 1960s. In order to accommodate the additional energy that will be supplied because of this project, Hydro One is adding an additional 230-kV circuit to the transmission line that runs from the Harmon Junction to the Kipling Generating Station, running approximately 4 km. The Moose Cree Nation will have up to a 25-per-cent equity share in the project. Construction is ongoing with the entire project slated for completion in 2015.

Station	Capacity Before Construction	Capacity Being Added	Capacity Today	Capacity at End of Project
Little Long	138 MW	67 MW (now complete)	205 MW	205 MW
Harmon	142 MW	78 MW	142 MW	220 MW
Kipling	154 MW	78 MW	154 MW	232 MW
Smoky Falls	52 MW	215 MW	52 MW	267 MW
<b>Total</b>	<b>486 MW</b>	<b>438 MW</b>	<b>553 MW</b>	<b>924 MW</b>



# BUILDING CLEAN POWER FOR ONTARIO

The Lower Mattagami Project will produce 438 more megawatts of clean, renewable hydroelectric power for Ontario. This \$2.6 billion partnership between Moose Cree First Nation and Ontario Power Generation is also providing skills development and jobs for local and First Nations people. We're in the home stretch with final testing now underway — tracking on budget and ahead of schedule for completion in 2015.

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

**\$2.6 billion**



**2014 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)

**Other:** Société québécoise des infrastructures (procurement and business case services advisor); SNC-Lavalin and WSP (owner's advisor); BTY Group (lenders' technical advisor); Hatch Mott MacDonald (independent certifier)

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

### Financing

Collectif Santé Montréal raised \$1.37 billion through the sale of secured bonds. This is the largest senior debt funding ever raised in Canada for a P3. The consortium's proposed phasing is the key to this innovative approach and will permit delivery of a fully functioning hospital. Any private funding will be reimbursed by the government.

The 2014-2024 Quebec Infrastructure Plan puts the full future cost of the CHUM redevelopment, including a final phase that involves a medical office tower and conference facility, at \$3.63 billion.



Credit: CHUM

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

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

**Supplier:** Demix Beton (concrete)

**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.)

## 17 Darlington Refurbishment Project – Definition Phase

**\$2.5 billion**



**2014 Rank:** 74

**Location:** Clarington, Ontario

**Owner:** Ontario Power Generation

**Engineer:** SNC-Lavalin, AECOM

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

**Other:** Alstom (equipment supply and technical services contractor); Burns & McDonnell (independent oversight); Golder Associates (construction monitoring, testing services); Hatch

**Funding:** Public

The Darlington generating station consists of four reactors, whose total output power is 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, turbine generators, and fuel handling equipment; and system improvements and plant upgrades to meet current regulatory requirements.

More than 450 unique tools were developed and delivered to complete the refurbishments. The reactor mockup was completed in March 2014, and detailed design and the procurement of materials continues. Starting in 2015, the mockups will be used for tool testing and to train the trainers, trades, and management to prepare for execution on the first unit scheduled for refurbishment (Unit 2).

OPG will commit to a final cost and schedule in fall 2015 before entering the Execution Phase of the project. Execution of the first unit will begin in October 2016. Final commitments on subsequent units will take into account the performance of the initial refurbishment. If approved, refurbishment of all four units would be completed in 2025.

Credit: Société de transport de Montréal



## 18 Montreal Metro Car Replacement

**\$2.47 billion**



### NEW

**Location:** Montreal, Quebec

**Owner:** Société de transport de Montréal (STM)

**Engineer:** SNC-Lavalin (consulting engineering services)

**Vehicle Supplier:** Bombardier-Alstom consortium

**Funding:** Public

- **Provincial** Transports Quebec: \$1.85 billion
- **Municipal** STM: \$618 million

## Financing

In October 2010, STM signed a contract with the Bombardier-Alstom consortium. The contract, to be spread out over several years, will cost \$1.2 billion. The 2014-2024 Quebec Infrastructure Plan lists the final amount as \$2.47 billion once all the other costs—financing charges, contingencies, and infrastructure upgrades—are included. The project is jointly financed by Transports Quebec (75 per cent) and the STM (25 per cent).

As part of this contract, STM will gradually replace its 336 MR-63 cars with 468 Azur cars, which will begin being replaced in 2015 and will be put on the orange line. Additional cars will be used to improve service and for possible Metro extensions. The updated vehicles are a major component of STM's Strategic Plan 2020, which also calls for expanding service, improving the customer experience, and growing STM's ridership by 40 per cent to 540 million passenger trips (a target that will be adjusted in 2015).

In April 2014, the STM performed modification work on the metro system to accommodate the new cars, but representatives said there wouldn't be any delays because of it. The new cars weigh in at 240 tons each, 13 tons more than the old MR-63 cars. The whole fleet is on track to be in operation by fall 2018.

## 19 New International Trade Crossing

**\$2.14 billion**



**2014 Rank:** 6

**Location:** Windsor, Ontario to Detroit, Michigan

**Owner:** Windsor-Detroit Bridge Authority

**Project/Construction**

**Manager:** Deloitte

**Engineer:** Morrison Hershfield; Parsons (previously Delcan) (bridge technical advisor); Davis Langdon (an AECOM company)

**Other:** Golder Associates (geotechnical/foundation engineering)

**Legal:** Fasken Martineau DuMoulin LLP (transaction advisor)

**Funding:** P3

This crossing is the largest and most ambitious binational border infrastructure project along the Canada-United States border. The project 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 Crossing Agreement called for

the establishment of a crossing authority, known as the Windsor-Detroit Bridge Authority (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 Crossing 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.

## Associated Project

### Rt. Hon. Herb Gray Parkway (\$1.4 billion)

This 11-km stretch connects Highway 401 to the New International Trade Crossing, while separating local and international traffic and keeping traffic flowing on the way to the U.S. border. The project's construction generated several local

controversies related to its lower-than-expected job creation, traffic noise, and treatment of surrounding neighbourhoods and properties. The parkway was substantially completed in 2014, with finishing work ongoing into 2015.

## 20 Confederation Line

**\$2.13 billion** 

**2014 Rank:** 18

**Location:** Ottawa, Ontario

**Owner:** City of Ottawa

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

**Engineer:** Capital Transit Partners—Morrison Hershfield, Jacobs Associates, STV Canada Consulting, and URS, an AECOM company (preliminary engineering); Parsons (previously Delcan) (functional design); Halcrow Group (tunnel design for EA report); Golder Associates; Hatch Mott MacDonald (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); MMM Group

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

**Other:** Delcan (technical advisor), Entro (wayfinding and signage)

**Legal:** Davis LLP (Rideau Transit Group Partnership); Borden Ladner Gervais LLP (counsel to City of Ottawa); Torys LLP (counsel to lenders); Stikeman Elliott LLP (Alstom); McCarthy Tétrault LLP (counsel to lenders)

**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 2.5-km tunnel that will rapidly move riders across downtown. Some parts of the existing bus rapid transit will be converted to LRT while others will be converted to park, pedestrian, or cycling areas. Unlike the existing O-Train, which is diesel powered, the new LRT will be electric. It will be a fully accessible and convenient system for all users, including cyclists. The 12.5-km rail line will consist of 13 stations between Tunney's Pasture in the west and Blair Station in the east, with three stations residing in the downtown tunnel.

The project also includes the widening of Highway 417 as well as the building of a maintenance and storage facility on Belfast Road, at which time selected vehicle assembly, as well as all cleaning, inspection, heavy maintenance, washing, and storage, will take place.

The maintenance and storage facility is expected to be complete by 2015. Operational testing of the line will commence in 2017, and full service will occur in spring 2018.

## 21 Calgary International Airport Development Project

**\$2 billion** 

**2014 Rank:** 17

**Location:** Calgary, Alberta

**Owner:** Calgary Airport Authority

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

**Program Manager:** AECOM

**Engineer:** Associated Engineering (prime consultants); CH2M HILL (sub to AE on new runway); Hatch Mott MacDonald (civil airside consultant on facilities and engineering design manager on runway development); Reed Jones Christoffersen (structural consultant); AECOM (electrical/mechanical consultant)

**Contractor:** EllisDon; Graham (air traffic control tower); CH2M HILL (airport trail tunnel under contract to the city)

**Other:** AirBiz (airport planning consultant); LVM (quality assurance); Entro (guest experience strategy, wayfinding, and signage); Engineering Harmonics (public address and digital signage consultants); SNC-Lavalin (on-call engineering services)

**Architect:** DIALOG (prime consultant)

**Supplier:** Canam (steel joists)

**Funding:** Private

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

The Calgary Airport Authority's Airport Development Program includes a new international concourse and a 14,000-foot-long, 200-foot-wide runway. The new terminal expansion, currently under construction, will more than double the size of the existing terminal building. The new runway is the longest civil runway in Canada. As the third-busiest and fastest-growing airport in the country, these projects are both capacity driven, ensuring the airport and its partners are well positioned for future growth and development. The airport development project, which includes both the runway development and the international facilities projects, will be the largest expansion this airport has ever undertaken.

The international terminal expansion incorporates a number of sustainable design principles, including high efficiency lighting and co-generation power. The new runway is able to depart the world's largest aircraft without payload restrictions and includes new parallel and cross-field taxiways, LED runway and taxiway lighting, and two taxiway underpasses.

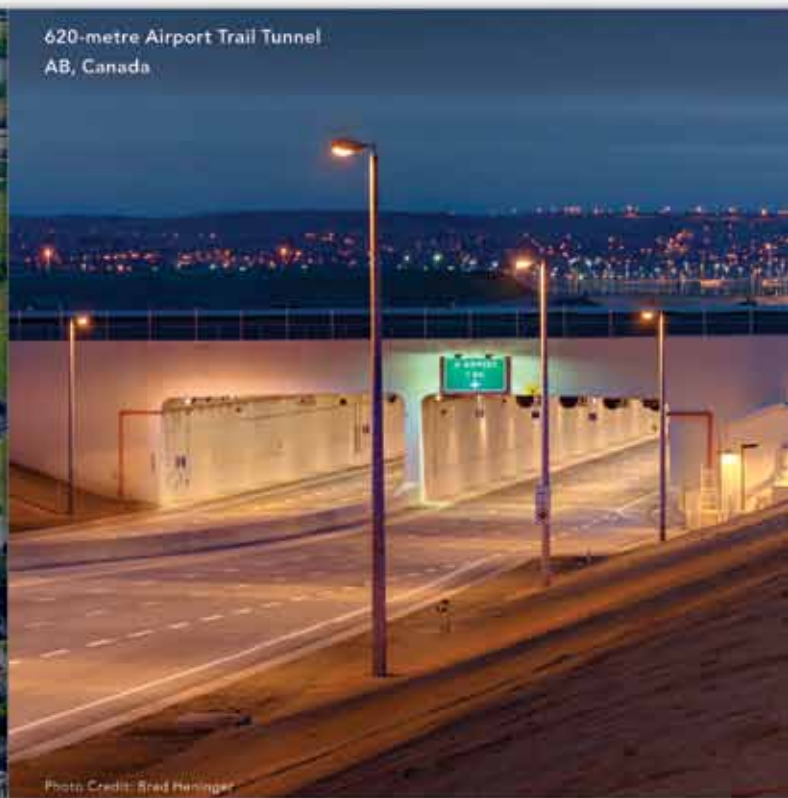
The new international concourse is scheduled to be completed in late 2015, and the airport's fourth and newest runway is now in full operation.



World class experience—local presence



Hanlan Feedermain, Woodward Ave. Wastewater Treatment Plant  
ON, Canada



620-metre Airport Trail Tunnel  
AB, Canada

Photo Credit: Brad Heninger

Energy

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Resources

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Credit: Ivanhoé Cambridge



## 22 45-141 Bay Street

\$2 billion 

NEW

**Location:** Toronto, Ontario**Owner:** Metrolinx and Ivanhoé Cambridge**Architect:** Wilkinson Eyre Architects (design); Adamson Associates (executive architect)**Other:** Halsall (sustainability consultants)**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 that will bring bus and rail services to one location. 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 45-141 Bay Street. The new bus terminal will serve thousands of GO customers and is an integral part of the Union Station Revitalization Project (No. 61) and Union-Pearson Express Spur Line (No. 92).

The project includes a proposed 2.5-million-square-foot office complex and elevated skypark over the rail corridor. The development will eventually be connected to the PATH system. The plan calls for a 2.7-million-square-foot office complex, including two 48-storey towers and an elevated park over railway tracks. It will have direct access to Union Station.

Construction is expected to start in spring 2015 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 

NEW

**Location:** Delta, British Columbia**Owner:** Port Metro Vancouver**Project/Construction Manager:** WorleyParsons (project management); WSP (construction management, quality assurance, reporting to the project manager and construction contract administration)**Environmental Services:** Hemmera (supporting project planning and leading the EA); Levelton Consultants Ltd. (air quality assessment)**Funding:** Private

- **Private** \$2 billion

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 km 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 submitted a project description to federal and provincial regulators in September 2013. On January 7, 2014, the Canadian Environmental Assessment Agency (CEAA) referred the proposed project to an independent review panel for an EA. Port Metro Vancouver is currently undertaking a range of desktop and field studies to understand the project's potential effects and how to mitigate them. The results of this work will be included in the environmental impact statement, which is expected to be submitted to the CEAA in 2015.

Construction is expected to begin in 2017. Subject to environmental approval, the project could be operational by 2023.



## The technical expertise behind the deal

Over the past 25 years, LeighFisher has provided consultancy advice on over \$100bn of successful bids, sales and bond/debt financing within the Aviation and Surface Transportation sectors and Infrastructure and Government Services.

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## 24 Northeast Anthony Henday Drive

### \$1.81 billion

**2014 Rank:** 20

**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); MMM Group; ISLEngineering and Land Services; GNEC/CTMS; Stantec; Amec Foster Wheeler; EBA; Buckland & Taylor (river crossing designer)

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

**Supplier:** Structural-Bridges/Rapid-Span Structures (steel bridge structures); Lafarge, AIL Construction Management; Goodco Z-Tech; Jatec-Nova Pole; High Pine

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

**Funding:** P3

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

This project is the last leg of the Anthony Henday Drive project. Scheduled to open in 2016, this 26-km, six and eight-lane highway is part of the larger Edmonton Ring Road project.

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.

Most of the driven steel H-piling on the bridge structures has been completed, and construction of the bridge decks, precast-concrete NU and box girders, and structural steel girders is underway. Installation of mechanically stabilized earth wall panels and excavation are also in progress. Granular base course is being laid, followed by asphalt paving. The construction of 17 bridges is complete, with traffic resuming on several of them. Design is complete, and construction will be ongoing until 2016.



Credit: City of Edmonton

## 25 Edmonton Valley Line – Stage 1

### \$1.8 billion

**2014 Rank:** 10

**Location:** Edmonton, Alberta

**Owner:** City of Edmonton

**Engineer:** Connected Transit Partnership—AECOM, Hatch Mott MacDonald, DIALOG, ISL Engineering and Land Services Ltd., GEC Architecture

**Other:** BTY Group (cost consultant)

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

**Funding:** P3

- **Federal** \$400 million
- **Provincial** \$600 million
- **Municipal** \$800 million

The Valley Line is the largest single infrastructure project in the history of Edmonton. It consists of a 27-km, 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.

The 13.1-km 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 project is currently in the design phase. The RFP was issued in fall 2014 for all shortlisted bidders, and the successful team will be selected in 2015.

Construction is expected to start in spring 2015, and service will be open to the public in 2020.



Edmonton Valley Line



Rt. Hon. Herb Gray Parkway



Maritime Link Project

# PLANNING

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Lower Mattagami Project

# ENGINEERING

## PROJECT & PROGRAM MANAGEMENT



Eglinton Crosstown Light Rail Transit



Calgary International Airport Developments

## 26 Vancouver International Airport Upgrades

**\$1.8 billion** 

**2014 Rank:** 21

**Location:** Vancouver, British Columbia

**Owner:** Vancouver Airport Authority

**Project/Construction Manager:**

Vancouver Airport Authority

**Engineer:** Stantec, MMM Group, SNC-Lavalin; Levelton Consultants Ltd. (materials engineering and quality management)

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

**Other:** Entro (wayfinding and signage)

**Legal:** McCarthy Tétrault LLP (represented VIAA)

**Supplier:** Canam (joists and steel deck)

**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.

Construction on the Domestic Terminal's A and B Piers is underway, and completion of the upgrades is estimated for 2022.

## 27 Humber River Regional Hospital

**\$1.75 billion** 

**2014 Rank:** 22

**Location:** Toronto, Ontario

**Owner:** Humber River Hospital

**DBFM Team:** Plenary Health Care Partnerships—Plenary Group/HCP Social Infrastructure (developer); Innisfree (equity); PCL Constructors Canada (design and construction); RBC Capital Markets (financial advisor/underwriter); HDR Architects; C.F. Møller Architects (digital hospital design); Halsall Associates

**Engineer:** Morrison Hershfield (consulting engineer); Smith and Andersen Consulting Engineers (mechanical/electrical consultant); Modern Niagara Toronto (mechanical); Plan Group (electrical); TBT Engineering (consulting engineer); Halsall (structural engineers/envelope engineer)

**Contractor:** PCL Constructors Canada

**Other:** Michael Brothers Excavating and Caledon Structures (formwork); Harris Rebar and Innocon (concrete); Prestressed Systems (precast); Infrastructure Ontario (procurement manager and project development); BTY Group (lenders' technical advisor); Entro (PSOS compliance); MMM Group (LEED, energy, measurement and verification, and commissioning); Golder Associates (concrete testing)

**Legal:** McCarthy Tétrault LLP (advised Infrastructure Ontario and Humber River Regional Hospital); Fasken Martineau DuMoulin LLP (advised lenders); Gowling Lafleur Henderson LLP (counsel to consortium)

**Supplier:** Canam (steel deck)

**Funding:** P3

• **Provincial** \$1.75 billion

This new hospital is being built on a block of approximately 27 acres as part of a larger campus owned by the Province of Ontario at Keele Street and Highway 401. Located in northwestern Toronto, the new hospital is in one of the fastest growing and most culturally diverse neighbourhoods in Canada. Aiming for LEED-Silver certification, this new hospital complex will be the first in Canada to be designed and constructed as a fully digital facility. Technology will be used in every facet of the building to improve efficiency and patient care, allowing a total of 107,000 visits a year for a catchment area of 850,000 people.

The building has been made watertight and construction is finishing up. Construction began in 2011 and is scheduled for completion by 2015.

## 28 Western Alberta Transmission Line

**\$1.65 billion** 

**2014 Rank:** 23

**Location:** Genesee area west of Edmonton to the Langdon area east of Calgary, Alberta

**Owner:** AltaLink

**Contractor:** SNC-Lavalin (EPC contractor and environmental mgmt)

**Funding:** Private

This 500-kV, 350-km transmission line will connect the Genesee area west of Edmonton to the Langdon area east of Calgary. Upon completion, the project will improve the reliability and efficiency of the Alberta interconnected electric system and ensure Albertans have access to the lowest-priced power.

About 950 structures will make up the new transmission line. To date, AltaLink has erected more than 600 structures and installed almost 800 structure foundations. The majority of structures are assembled in designated yards off of the right of way. Specialized helicopters are then used to lift, move, and erect sections of the structures. Using a helicopter significantly reduces the amount of construction traffic and corresponding environmental impacts on the right of way.

Construction is expected to be complete in spring 2015.



Credit: Hydro-Québec

## 29 Renovations to Beauharnois Generating Station

**\$1.6 billion** 

**2014 Rank:** 24

**Location:** Beauharnois, Quebec

**Owner:** Hydro-Québec

**Project/Construction Management:** Hydro-Québec Équipement

**Engineer:** Dessau, SNC-Lavalin, CIMA +

**Contractor:** HMI Construction Inc.

**Supplier:** 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.

## 30 Hurontario-Main LRT

**\$1.6 billion** 

**2014 Rank:** 25

**Location:** Mississauga and Brampton, Ontario

**Owner:** Metrolinx

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

**Engineer:** SNC-Lavalin (project lead) with Steer Davies Gleave (preliminary engineering); Golder Associates (geo-tech for EA and preliminary design)

**Other:** Steer Davies Gleave (initial transit system planning); DIALOG (urban design); LEA Group (ITS)

**Funding:** Public

### Financing

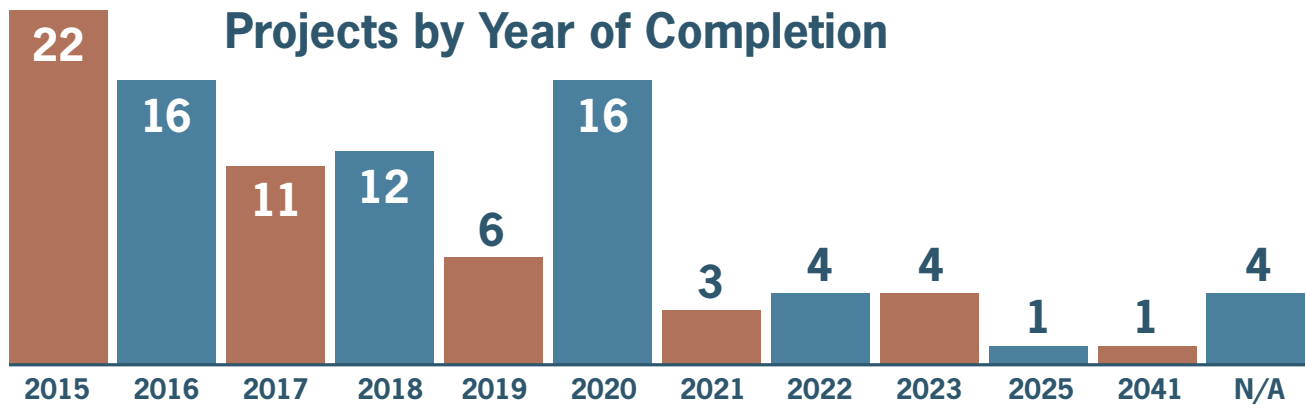
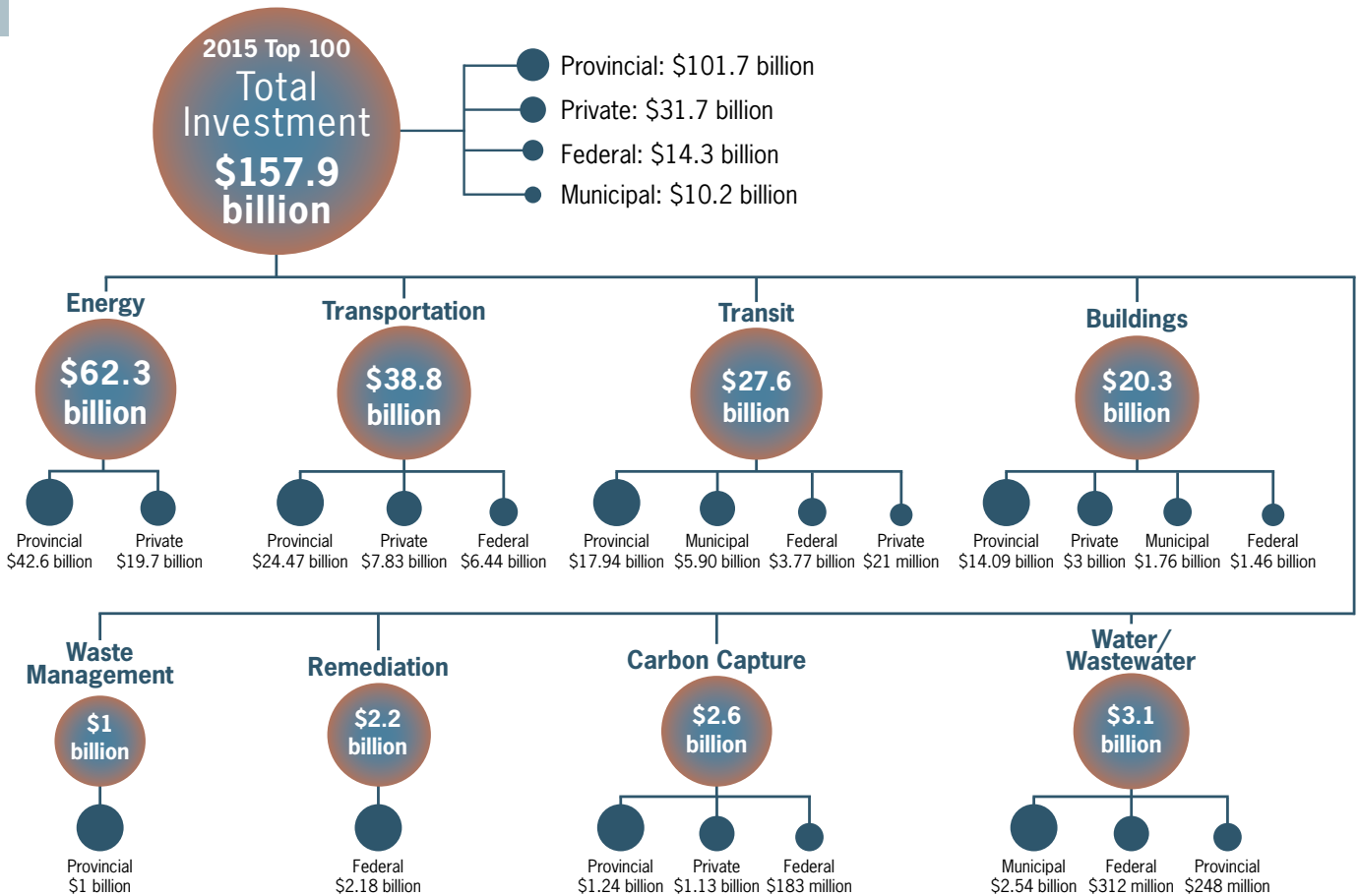
The cities and Metrolinx continue to explore funding opportunities for the project, including federal, provincial, municipal, and other sources.



Credit: City of Mississauga

The Hurontario-Main LRT is 23 km of new light rail transit that will run from Hurontario Street at the Port Credit GO Station in Mississauga, around Mississauga's City Centre area, and north on Hurontario Street to Brampton's downtown Main Street. The LRT vehicles will primarily run in segregated lanes at-grade and have signalized intersection priority, with an estimated average operating speed of 27 km per hour. A one-way journey from end to end will take 47 minutes—a trip that currently takes more than an hour. A maintenance and storage facility is also proposed as part of the project.

The project is currently in the final stage of preliminary design and the transit project assessment process. Subject to EA approval, pre-procurement planning will be initiated, leading to a formal project schedule and milestones.



**Top 100 Projects**  
PLATINUM ELITE 2015  
20 projects or more

**Top 100 Projects**  
PLATINUM 2015  
10 projects or more

**Top 100 Projects**  
GOLD 2015  
6 to 9 projects

**Top 100 Projects**  
SILVER 2015  
3 to 5 projects

**Top 100 Projects**  
BRONZE 2015  
2 projects

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Bridgepoint Hospital, Toronto, ON



Kicking Horse Canyon Highway, BC



Waterloo LRT, Waterloo, ON



Victoria Memorial Museum Building, Victoria, BC

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# P3 Canada Fund Investments

## \$1.2B at Work Across Canada



Kokish River  
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 2014, 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**



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**



Sorting and Waste Treatment Centre  
(Granby, QC)  
**Up to \$12.00M**



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.

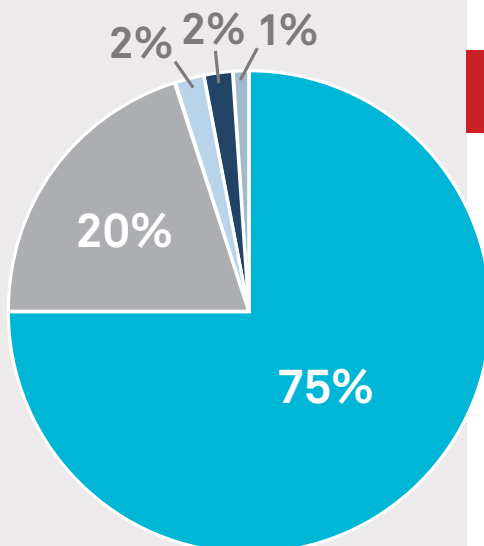
## New entrants

- The Fund has committed funding to 15 municipal P3s in 14 municipalities – and 12 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
- Brownfield Redevelopment
- Green Energy

## 31 Fort McMurray West Transmission Project

**\$1.6 billion** 

**NEW**

**Location:** Edmonton to Fort McMurray, Alberta

**Owner:** Alberta Electric System Operator (AESO)

**Funding:** Private

• **Private** \$1.6 billion

### Financing

The \$1.6-billion cost is a planning estimate with an expected accuracy of  $\pm 50$  per cent. Ownership will be turned over to the consortium selected, who will then design, finance, own, and operate the line and will earn fixed monthly payments for 35 years from AESO.

This project will consist of approximately 500 km of transmission line and associated facilities in order to support increasing growth in northeastern Alberta. A number of potential solutions have been studied to meet the growing energy needs of the Fort McMurray area, and AESO determined additional transmission lines will address the needs most effectively.

The project will include a 500-kV AC single-circuit transmission line, approximately 100 km 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 km in length, running from Livock 939S substation to the approved Sunnybrook 510S substation.

In January 2014, AESO named the five companies that competed for the opportunity to build, finance, own, and operate this piece of transmission infrastructure under the newly created, provincially mandated competitive process. The winning bidder was to be announced in December 2014. The target in-service date is 2019.

## 32 Maritime Link Project

**\$1.56 billion** 

**2014 Rank:** 26

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

**Owner:** Emera Newfoundland & Labrador (ENL) (NSP Maritime Link Inc.)

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

**Other:** Maclean Forestry (clearing in Nova Scotia); Major's Logging (clearing in Newfoundland); Nexans (subsea cable contract); ABB (converter and substations); JonelJim (site prep in N.S.); MCI (site prep in N.L.)

**Legal:** Cox & Palmer, Osler, Skadden Arps & McCarthy Tétrault LLP (underwriter for Maritime Link Financing Trust)

**Funding:** Private



### Financing

Funding is private with support of a Federal Loan Guarantee from the Government of Canada.

In its update to the Nova Scotia Utility and Review Board (UARB) on December 13, 2013, NSP Maritime Link reported its net cost estimate as \$1.56 billion, which is within the range approved by the UARB. The Maritime Link Financing Trust was completed in April 2014.

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-km subsea cables across the Cabot Strait, close to 50 km of overland transmission in Nova Scotia, and nearly 300 km 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. ENL started a geotechnical field program with Hatch in April 2014 to investigate and test soil and rock properties. Labour agreements have been finalized and signed, and construction is expected to be complete in 2017.

## Energy Development in Canada

Total investment in Energy: **\$62.3 billion**

**\$38.7 billion**

14 projects



**Hydroelectric**  
11,391 MW

**\$3.4 billion**

3 projects



**Natural Gas**  
1,935 MW

**\$2.5 billion**

1 project



**Nuclear**  
3,512 MW

**\$2.2 billion**

3 projects



**Wind**  
800 MW

**\$1.5 billion**

1 project



**Coal**  
520 MW

### Generation

- \$48.3 billion
- 22 projects
- 18,208 MW

### Transmission

- \$14 billion
- 9 projects
- 5,805 km of power lines

### 33 H.R. Milner Coal Plant Expansion

**\$1.5 billion** 

**2014 Rank:** 27

**Location:** Grande Cache, Alberta

**Owner:** Maxim Power

**Contractor:** Covanta Energy Corporation

**Funding:** Private

The goals of this initiative are to increase electrical generating capacity in Alberta and provide long-term economic benefits to the local and regional area. In August 2012, Maxim Power received the final approvals required to begin the expansion of the 40-year-old, 150-MW H.R. Milner Power plant, dubbed M2. Maxim plans to build two 260-MW combined-cycle gas turbine power plants on the site in stages. Natural gas will be supplied via an expansion of the existing natural gas pipeline currently supplying M1.

Construction is anticipated to begin in spring 2015. The first 260-MW power plant is expected to become operational in fall 2017 and enter commercial service in January 2018. It is anticipated the second stage of construction will begin in 2016.

### 34 Great Spirit Power Project

**\$1.5 billion** 

**NEW**

**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); Levelton Consultants Ltd. (quality management)

**Funding:** Private



Credit: Google Maps

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.

Financial close was to be reached at the end of 2014. Construction of the facility is to be completed in early 2018.

### 35 Evergreen Rapid Transit Line

**\$1.43 billion** 

**2014 Rank:** 30

**Location:** Metro Vancouver, British Columbia

**Owner:** TransLink

**DBF Team:** EGRT Construction—SNC-Lavalin, Graham, International Bridge Technologies, Jacobs Associates, Rizzani de Eccher, SELI Canada, SNC-Lavalin Constructors, MMM Group

**Engineer:** SNC-Lavalin (lead engineer); International Bridge Technologies (bridges); Hatch Mott MacDonald (Ministry's owner's engineer); Parsons (previously Delcan) (independent engineer); Golder Associates (sub to owner's engineer); MMM Group (structural, transportation, civil, and mechanical engineering services, and technical director)

**Contractor:** Graham, SNC-Lavalin Constructors, SELI Canada, Rizzani de Eccher, MMM Group, Jacobs Associates Canada

**Other:** Partnerships BC (procurement partner and project implementation); LeighFisher (lenders' technical advisor)

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

**Legal:** McCarthy Tétrault LLP (advised lenders to EGRT); Davis LLP (advised SNC-Lavalin and EGRT); Gowling Lafleur Henderson LLP (counsel to SELI)

**Architect:** DIALOG (sub-consultant to SNC-Lavalin)

**Supplier:** Structal-Bridges (expansion joints); Bombardier (vehicles)

**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
- **Private** Other partners: \$21 million

The Evergreen Line Rapid Transit Project is an 11-km, 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 2-km bored tunnel, seven stations, 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.

Columns have been completed on North Road as well as elevated guideway construction. The project will be fully integrated with the existing SkyTrain system with completion scheduled for 2016.

## 36 Shepard Energy Centre

### \$1.4 billion

**2014 Rank:** 35

**Location:** Calgary, Alberta

**Owner:** Enmax and Capital Power Corp.

**Engineer:** Black and Veatch

**Contractor:** SNC-Lavalin (EPC contractor); Kiewit Energy

**Turbine Supplier:** Mitsubishi Electric Power Products (steam and gas turbines)

**Funding:** Private

• **Private** \$1.4 billion

This 800-MW natural-gas-fired power plant will produce energy via two natural gas turbines and one steam turbine. The gas turbines are each capable of producing 240 MW, and the steam turbine is capable of producing up to 320 MW. The waste heat produced from the gas turbines will be captured and used to produce steam for the third turbine.

In 2013, Capital Power Corp. purchased a 50-per-cent share in the centre, so now Capital Power and Enmax have a joint venture agreement to build, own, and operate the facility. Construction began in July 2011, and in July 2014, Enmax applied for an extension on its construction deadline due to some earlier delays. However, the plant is still expected to be completed on schedule and begin operations in 2015.



Credit: Enmax

## 37 York VIVA Bus Rapid Transit (vivaNext)

### \$1.4 billion

**2014 Rank:** 32

**Location:** York Region, Ontario

**Owner:** York Region Rapid Transit Corp. and Metrolinx

**Project/Construction Manager:** Kiewit EllisDon, a Partnership (rapidways along Highway 7 between Bayview and Warden avenues in Markham)

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

**Program Manager:** MMM Group

**Engineer:** AECOM; Parsons (previously Delcan); KED; McCormick Rankin Corp.; MMM Group; URS, an AECOM company; Ecoplans Ltd.; IBI Group (design engineer)

**Environmental Services:** SPL Consultants (environmental consultant, EA); WSP

**Other:** Golder Associates (geotechnical and pavement services); Ecoplans Ltd.; Hanscomb; Revay and Associates; Entro; Hatch Mott MacDonald; Morrison Hershfield (prime design consultants); LeighFisher (independent quality certifier)

**Legal:** McCarthy Tétrault LLP

**Vehicle Supplier:** NovaBus

**Supplier:** Canam (steel joists); Van Hool

**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.

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## 38 Quest Carbon Capture and Storage Project

**\$1.35 billion**



**NEW**

**Location:** Scotford, Alberta

**Owner:** Athabasca Oil Sands Project JV (Shell, Chevron, and Marathon Oil)

**Contractor:** Fluor (EPC contractor)

**Supplier:** KBR Canada Ltd. (pre-assembled modules)

**Funding:** Public/Private

- **Federal** Clean Energy Fund: \$120 million
- **Provincial** CCS Fund: \$745 million
- **Private** Shell (60%), Chevron Canada (20%), and Marathon Oil Canada (20%): \$485 million

## Financing

The Alberta government invested \$745 million in Quest from a \$2-billion fund to support CCS, and the Government of Canada invested \$120 million through its Clean Energy Fund. The remaining funding is from Shell and its Athabasca Oil Sands Project partners, Chevron Canada and Marathon Oil Canada.

This project will capture more than one million tonnes per year of CO<sub>2</sub> from the Scotford Upgrader located near Edmonton and transport it up by an 80-km underground pipeline to a storage site north of the Scotford site. Here, it will inject it more than 2 km underground into a porous rock formation called the Basal Cambrian Sands, which is located beneath layers of impermeable rock. Sophisticated monitoring technologies will ensure the CO<sub>2</sub> is permanently stored.

The project received regulatory approval in July 2012, and Shell began construction in September 2012. Once operational in late 2015, it will join a handful of commercial-scale carbon capture and storage projects in operation worldwide.

## 39 Chamouchouane–Bout-de-l'Île Transmission Line

**\$1.35 billion**



**NEW**

**Location:** Saguenay to Montreal, Quebec

**Owner:** Hydro-Québec


**Supplier:** Siemens (SVC substation)

**Funding:** Public

This project includes building a new 735-kV, 406-km 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.

Public consultation is ongoing, and the project is still waiting on government authorization. If successful, construction is anticipated to begin around the end of 2015. Commissioning is planned for September 2018.

## 40 Route 185 Widening

**\$1.34 billion** 

**2014 Rank:** 34

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

**Owner:** Transports Québec

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

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

**Supplier:** Holcim Canada (cement)

**Funding:** Public


- **Federal** \$222.5 million
- **Provincial** \$1.08 billion



Credit: Transports Québec

This project will expand 94 km 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.

## 41 New Cancer Centre in Calgary

**\$1.3 billion** 

**NEW**

**Location:** Calgary, Alberta

**Owner:** Alberta Health Services

**Other:** Arup (prime consultant)

**Architect:** HKS and Marshall Tittlemore Architects (subconsultants)

**Funding:** Public/Private

- **Provincial** \$160 million budgeted for 2014-17
- **Private** Alberta Cancer Foundation: \$200 million

## Financing

Alberta's Fiscal Plan 2014-17 said the centre is projected to cost more than \$1 billion, with \$160 million budgeted for the project over the next three years. In March 2014, the Calgary Herald called it a "colossal \$1.3-billion facility." Regardless of the estimates being made, the final cost will depend on which financing plan is chosen, and a P3 is reportedly being considered.

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.

While the commencement of construction was originally slated for 2015, recent provincial budget documents indicate work on the facility won't get underway until 2016. An opening day is pegged for summer 2020.

## A Look Back at the Top 100

The total value of the Top 100 projects list has grown over the years (in billions of dollars)



## 42 Port Hope Area Initiative

**\$1.28 billion** 

**2014 Rank:** 36

**Location:** Port Hope and Clarington, Ontario

**Owner:** Natural Resources Canada and Atomic Energy Canada Limited

**Project/Construction Manager:** MMM Group (EPC management)

**Engineer:** AECOM (Port Granby project)

**Contractor:** Atomic Energy of Canada; Maple Reinders (Port Grandby)

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

**Financiers/Banks:** Natural Resources Canada

**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. 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. 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 aboveground 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.

The cleanup is expected to begin in 2016.

## 43 Highway 63 Twinning Program

**\$1.22 billion** 

**NEW**

**Location:** Grassland to Fort McMurray, Alberta

**Owner:** Alberta Transportation

**Engineer:** AECOM; Amec Foster Wheeler; ARA Engineering Ltd.; Associated Engineering; CH2M HILL (Athabasca River Bridge); EBA, a Tetra Tech Company; Focus; McElhanney Consulting Services Ltd.; Stantec; Stewart Weir & Co.; Thurber Engineering Ltd.; WSP Canada

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

**Funding:** Public

• **Provincial** \$1.22 billion



Credit: Alberta Transportation

The twinning of 240 km of Highway 63 between Grassland and Fort McMurray is for the safety of motorists and to improve traffic flow within Fort McMurray. By fall of 2015, 70 per cent of the twinning commitment is expected to be complete, and the remaining 30 per cent will 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](http://bit.ly/63twinning) for a full breakdown of contracts.

## 44 Alberta Carbon Trunk Line

**\$1.2 billion** 

**NEW**

**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

**Other:** WSP/Focus (geomatics services); NorthWest Refinery; Agrium Inc.

**Legal:** Dentons (counsel on EPCM agreement)

**Funding:** Public/Private

• **Federal** \$63.2 million

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

• **Private** \$641.8 million

This 240-km pipeline will collect CO<sub>2</sub> from industrial emitters in and around Alberta's Industrial Heartland and transport it to aging reservoirs throughout central and southern Alberta for secure storage in enhanced oil recovery projects. At full capacity, the line will provide access to reservoirs capable of producing an additional one billion barrels of high-quality light crude oil. These reservoirs will safely and securely store 14.6 million tonnes of CO<sub>2</sub> per year as the oil is produced.

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.

## 45 Romaine Complex Transmission Line

**\$1.2 billion** 

### NEW

**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-Quebec: \$1.2 billion

This project involves the construction of transmission lines needed to connect the 1,550-MW Romaine Complex (No. 3) 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 km 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

## 46 East Side Transportation Initiative

**\$1.125 billion** 

**2014 Rank:** 11

**Location:** Eastern Manitoba, Manitoba

**Owner:** East Side Road Authority

**Engineer:** SNC-Lavalin, AECOM

**Environmental Services:** Tetra Tech

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

**Funding:** Public

• **Provincial** \$1.125 billion

### Financing

The full budget is \$3 billion (the value assigned to the project in 2014's Top 100), but the East Side Road Authority said only \$1.125 billion has been committed by the provincial government so far. Discussions are underway with the federal government regarding federal involvement in the project.



Credit: East Side Road Authority

This initiative is a large-scale transportation project that aims to connect 13 First Nations communities on the east side of Lake Winnipeg that currently do not have all-season road access. The initiative will build 1,000 km of all-season road connecting the communities to Manitoba's road network.

By fall 2014, the Bloodvein River Bridge project will have been completed, providing all-season road access to the 1,800 residents of Bloodvein First Nation. The road north of Bloodvein and south of Berens River is under construction and should be completed by 2019. Further north, three Acrow bridge panels are being installed on the winter road network to increase the length of time the roads can be used by local residents and commercial truckers. The detailed and functional design is underway for this initiative.

## 47 John Hart Generating Station Replacement Project

**\$1.093 billion** 

**2014 Rank:** 47

**Location:** Campbell River, British Columbia

**Owner:** BC Hydro

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

**Environmental Services:** Hemmera (support to BC Hydro); SNC-Lavalin

**Other:** Frontier-Kemper, IMPSA, Hatfield (dam safety inspection); Golder Associates; Mott MacDonald (lender's technical advisor)

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

**Funding:** P3

• **Provincial** \$1.093 billion



Credit: BC Hydro

## Financing

BC Hydro will provide 60 per cent of the approximately \$700-million construction capital cost, with InPower BC General Partnership (to design, build, partially finance, maintain, and rehabilitate) 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.

This generating station project includes the replacement of three 1.8-km penstocks with a 2.1-km 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.

## 48 Highway 407 East Extension – Phase 1

**\$1 billion** 

**2014 Rank:** 39

**Location:** Pickering to Oshawa, Ontario

**Owner:** Ontario Ministry of Transportation

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

**Program Manager:** CH2M HILL (program manager to Infrastructure Ontario)

**Engineer:** SNC-Lavalin; Ferrovia Agroman S.A.; Janssen & Spaans Engineering; AIA Engineers

**Other:** Infrastructure Ontario (project development, procurement, and implementation manager); Morrison Hershfield and URS Canada (technical advisors to Infrastructure Ontario); Parsons (previously Delcan) (owner's engineer); AECOM (prime consultant—IEA, preliminary design, terms of reference); Golder Associates (pavement engineering and materials quality control); LeighFisher (lenders' technical advisor); Aecon

**Financiers/Banks:** Bank of Montreal and Desjardins (financing, bond underwriting, and lenders); CIBC World Markets (capital markets advisor to Infrastructure Ontario)

**Legal:** McCarthy Tétrault LLP

**Supplier:** Dufferin Concrete

**Funding:** P3

• **Provincial** \$1 billion

This first phase extends Highway 407 20.3 km easterly 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-km, four-lane divided highway to be built east of Lake Ridge Road in Whitby; and require a 5-km realignment of Highway 401 to accommodate the West Durham Line.

Phase 1 is currently under construction and is expected to be open to traffic in late 2015.



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## 49 Deep Geological Repository

\$1 billion



**2014 Rank:** 38

**Location:** Kincardine, Ontario

**Owner:** Ontario Power Generation

**Project/Construction Manager:**

Nuclear Waste Management Organization

**Other:** Golder Associates

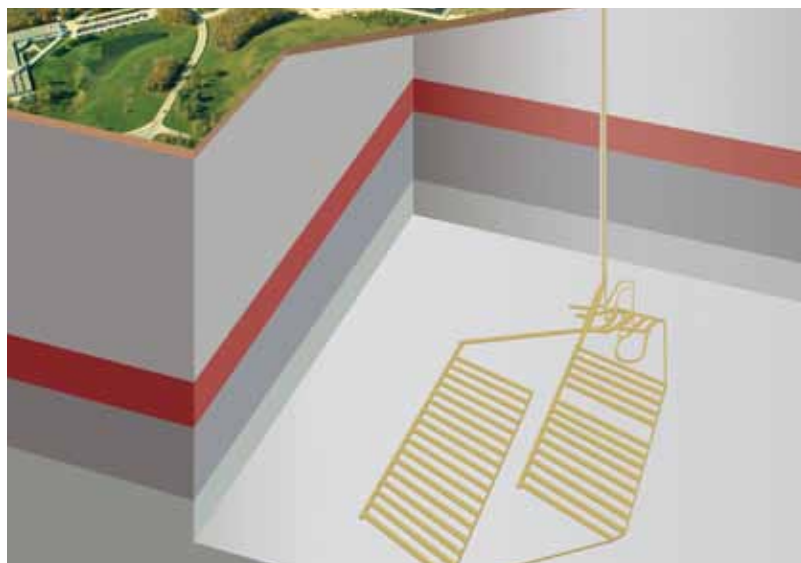
(environmental impact statement);

Geofirma Engineering Ltd. (geoscientific characterization); Tetra Tech;

WorleyParsons Ltd.; G.L. Tiley &

Associates Ltd.; AECOM

**Funding:** Public



Credit: Ontario Power Generation

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.

As of late 2012, the review period for the project was extended to allow for OPG to respond to information requests. Public hearings closed in fall 2014, and an EA report is being submitted to the federal Minister of the Environment in early 2015. The joint review panel for the project may then be authorized to decide on whether or not to license the project's site preparation and construction.

## 50 Finch West LRT

\$1 billion



**2014 Rank:** 41

**Location:** Toronto, Ontario

**Owner:** Metrolinx

**Project/Construction Manager:** Metrolinx supported by Pivotal Projects; Parsons Brinckerhoff (program management)

**Engineer:** CH2M HILL (owner's engineer); Halsall (engineer/sustainability consultant)

**Other:** AECOM (technical advisor); Parsons (overseeing technical advisor)

**Consulting Engineer:** SPL Consultants (geotechnical consultant)

**Vehicle Supplier:** Bombardier

**Supplier:** Dufferin Concrete

**Funding:** Public

• **Provincial** Ministry of Transportation capital allotment to Metrolinx: \$1 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.

## 2015 Top 100 Project Delivery

Total Investment: \$157.9 billion

48  
Public  
\$81.5  
billion

(51.6% of list value)

26  
Public-Private  
Partnerships  
\$40.4  
billion

(25.6% of list value)

18  
Private  
\$21.3  
billion

(13.5% of list value)

8  
Public/Private  
\$14.7  
billion

(9.3% of list value)



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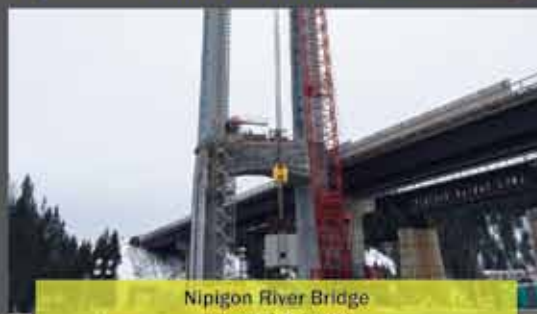
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Interior to Lower Mainland Transmission Project  
Merritt, BC, to Coquitlam, BC



Nipigon River Bridge  
Thunder Bay, ON



Northeast Stoney Trail  
Calgary, AB



## 51 Sheppard East LRT

**\$1 billion** 

**2014 Rank:** 46

**Location:** Toronto, Ontario

**Owner:** Metrolinx

**Project/Construction Manager:**

Metrolinx (project manager); 4Transit, a JV with Parsons (previously Delcan) and Hatch Mott MacDonald (project management consultant)

**Engineer:** CH2M HILL (owner's engineer); Parsons Brinckerhoff (program management); Halsall (structural engineers, sustainability consultants)

**Contractor:** Dufferin Construction (Agincourt grade separation)

**Other:** SPL Consultants (geotechnical consultant); URS, an AECOM company (EA and preliminary design); Parsons (overseeing technical advisor); LeighFisher (technical advice)

**Vehicle Supplier:** Bombardier

**Funding:** Public

- **Federal** \$333 million
- **Provincial** Ministry of Transportation capital allotment to Metrolinx: \$667 million

The Sheppard East LRT is a 13-km light rail transit line that will run in a dedicated lane in the centre of the street, along the surface of Toronto's Sheppard Avenue from Don Mills Station to Morningside Avenue. The line is projected to serve 3,000 people per hour in the peak direction by 2031.

A vital component of the new LRT line will be the Sheppard East Maintenance and Storage Facility. The facility will service the 100 light rail vehicles that will operate on the Sheppard East LRT and Scarborough RT. The 17,500-square-metre facility will be built on approximately 12.9 hectares of land located on the corner of Sheppard Avenue and Conlins Road.

Primary design and engineering work is currently underway. Completion is projected for 2021.

## 52 Regina Bypass Project

**\$1 billion** 

**NEW**

**Location:** Regina, Saskatchewan

**Owner:** Saskatchewan Ministry of Highways and Infrastructure

**Engineer:** Associated Engineering (owner's engineer)

**Other:** MMM Group (planning work)

**Funding:** P3

In a project that could cost more than \$1 billion, this 40-km highway will run from Highway 11 north of the city and around its southwest to meet the Trans-Canada Highway east of Tower Road. Once construction begins, it will be the largest transportation infrastructure project in the province's history.

The bypass route has been finalized and land acquisition is underway. Construction is expected to begin in summer 2015 with completion expected by 2018.

## Financing

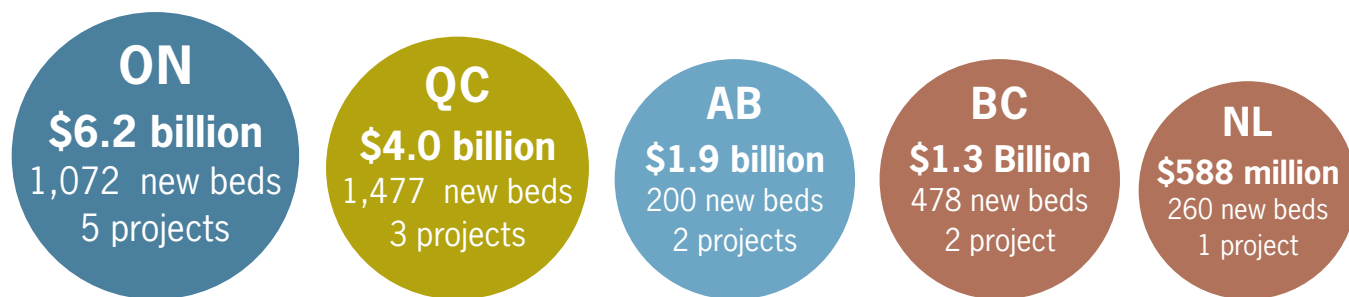
In August 2014, three consortia were invited to participate in the request for proposals:

- Queen City Infrastructure Group—HOCHTIEF, Aecon, InfraRed, Flatiron, AECOM, Tetra Tech, MMM Group, Volker Stevin Highways, and CIBC
- SaskLink Global Transportation Partners—VINCI, GraCorp Capital, Parsons, Graham, Carmacks, McElhanney, Urban Systems, Buckland & Taylor, exp, Clifton Associates, Delcan, and National Bank
- Wascana Development Partners—SNC-Lavalin, Kiewit, Stantec, Amec Foster Wheeler, WF Botkin Construction, Westridge Construction, and Scotiabank

The successful proponent will be announced in the summer 2015. The current project cost is merely an estimate, as the project is still undergoing procurement.

## Health Care Breakdown

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



Total Investment:  
**\$14.0 billion**

Total New Beds: \*  
**3,487**

Total Project Count:  
**13**

Credit: CHU Sainte-Justine



## 53 Sainte-Justine University Hospital Centre

**\$995 million** 

**2014 Rank:** 44

**Location:** Montreal, Quebec

**Owner:** Sainte-Justine University Hospital Centre

**Project/Construction Manager:** TDC Consortium—Tecsult, DECASULT (AECOM), CIMA +

### 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:** Expansion: SNC-Lavalin (EPC contractor)

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

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

### Architect:

Expansion: Provencher Roy, Menkès Shooner Dagenais Letourneux

Modernization: Brière, Demontigny, Gilbert et Associés, Hébert Fortin Martin Consortium, Jodoin Lamarre Pratte et Associés, Lemay et Associés, Métivier, Provencher Roy

**Supplier:** Demix Beton (concrete); Honeywell (HVAC and building automation system); Siemens (SBT installed base)

**Funding:** Public/Private

• **Provincial** \$925 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 more than 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.

## 54 Giant Mine Remediation Project

**\$903.5 million**



**NEW**

**Location:** Yellowknife, Northwest Territories

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

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

**Engineer:** AECOM (planning/study design of remediation plan)

**Funding:** Public

• **Federal** \$903.5 million

Between 1948 and 2004, the Giant Mine was a major economic driver for Yellowknife and the Northwest Territories. Mining operations at the site, which grew over the years to encompass more than 870 hectares, including a number of ponds and small lakes, were halted in July 2004. Since 2005, Aboriginal Affairs and Northern Development Canada (AANDC) and the Government of Northwest Territories 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 is contributing project management, engineering, procurement, and environmental services in the implementation of assessment and remediation of such contaminated sites.

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 long-term 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.

## 55 The Waneta Expansion

**\$900 million**



**2014 Rank:** 48

**Location:** South of Trail, British Columbia

**Owner:** Fortis, Columbia Power Corp., and the Columbia Basin Trust

**Engineer:** Golder Associates (environmental consulting engineers); Hatfield Consultants; Hatch

**Contractor:** SNC-Lavalin (EPC contractor); Aecon (civil design, construction)

**Financiers/Banks:** CIBC World Markets (advisor to Columbia Power and Columbia Basin Trust)

**Legal:** Fasken Martineau DuMoulin LLP (advising Waneta Expansion Limited Partnership)

**Turbine Supplier:**

Voith Hydro

**Funding:** Private

• **Private Fortis:** \$459 million  
CPC/CBT: \$441 million

This expansion project involves the addition of a second powerhouse downstream from the Waneta Dam on the Pend d'Oreille River, producing 335 MW. A new 10-km transmission line has been constructed to deliver a stepped-up output of 230 kV from the powerhouse to BC Hydro's Selkirk Substation. The energy will be sold to BC Hydro under a long-term energy purchase agreement.

Recently, construction has included completion of work on the runner, stator, and rotor for one unit, the installation of the gates, stoplogs, and sturgeon exclusion screens in the powerhouse, as well as blasting in the tailrace area and structural concrete work in the intake area. Completion of electrical and mechanical work, rotor and stator assembly for the remaining unit, and further preparations in the intake area continue.

Construction started in 2010 and completion is expected in 2015.

## Transit Expansion

Top 100 involves **166 km** of new transit lines at a cost of **\$166.3 million per km**.



**LRT**



**Subway**



**BRT**



**Rail**

Credit: 8 Wing Imaging/CFB Trenton



## 56 Canadian Forces Base Trenton Expansion

**\$860 million**



**2014 Rank:** 50

**Location:** Trenton, Ontario

**Owner:** Department of National Defence

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

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

**Environmental Services:** LVM

**Other:** Engineering Harmonics (AV consultants)

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

**Funding:** Public

• **Federal** \$860 million

Established in 1929, CFB Trenton has traditionally been an air base, home to the 8 Wing unit, and it is one of Canada's primary launching sites for military missions abroad.

The base is now undergoing a major expansion that will add the Land Advanced Warfare Centre (a multi-functional training and administrative campus) 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 eight components already complete. The project continues and is expected to be finalized by 2022.

## 57 K2 Wind Project

**\$850 million**



**2014 Rank:** 54

**Location:** Township of Ashfield-Colborne-Wawanosh, Ontario

**Owner:** Capital Power, Samsung Renewable Energy, and Pattern Renewable Holdings

**Project/Construction Manager:** Capital Power

**Engineer:** Amec Foster Wheeler and Stantec

**Contractor:** AMEC Black & McDonald (prime EPC subcontractor), Samsung Renewable Energy (holds main EPC contract)

**Environmental Services:** Stantec

**Other:** SENES Consultants, Archaeological Research Associates, Selde Corporation and Zephyr North Canada (Renewable Energy Approval application); MMM Group (Geomatics)

**Turbine Supplier:** Siemens

**Funding:** Private

This 270-MW renewable energy facility has a 20-year power purchase agreement from the Ontario Power Authority under the Green Energy Infrastructure Agreement. Once operational, it will generate clean power for approximately 100,000 Ontario homes annually and is located on privately owned lands in the Township of Ashfield-Colborne-Wawanosh, Ontario.

Like nearly all rural wind farms in Ontario, K2 Wind has incited opposition from some locals. The owners responded by creating a Community Renewable Energy Benefit, which pays \$1,500 annually to landowners not already participating through land lease option agreements but who are located within 1 km of project infrastructure. K2 has also entered into two agreements with the township: the Community Benefits Fund Agreement will deliver approximately \$15 million in funding to the township for community initiatives over the next two decades, and the Road User Agreement details how the township and K2 Wind will work together during the project's development.

Project construction began in March 2014, and commercial operation is expected to begin in the first half of 2015.

## 58 Prince Rupert Port Expansion

**\$820 million**



**2014 Rank:** 52

**Location:** Prince Rupert, British Columbia

**Owner:** Maher Terminals

**Environmental Services:**

SNC-Lavalin; Stantec (environmental mitigation strategy report)

**Other:** 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 20-foot equivalent units annually.

Phase 1, which was completed in late 2007, cost \$170 million, and 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 (just the container terminal, listed by itself in 2013's list) and includes a \$90-million Road Rail Utility Corridor, which started construction in March 2013 and was expected to be completed by the end of 2014. This corridor includes construction of five parallel rail tracks, a two-lane roadway, and a port-owned power distribution system along an 8-km corridor.

A final investment decision was to have been made by Maher at the end of 2014, and construction is slated to begin in 2015.

## 59 ION Region of Waterloo LRT

**\$818 million**



**2014 Rank:** 53

**Location:** Waterloo, Kitchener, and Cambridge, Ontario

**Owner:** Region of Waterloo

**Engineer:** Parsons Brinckerhoff (owner's engineer: includes technical advisor, program manager and owner's engineer role); WSP (sub to Parsons Brinckerhoff)

**DBFMO Team:** GrandLinq—Plenary, Meridiam, Aecon, Kiewit, and Keolis

**Other:** AECOM, BTY Group (lenders' technical advisor); Golder Associates (construction); Hatch Mott MacDonald (EA)

**Financiers/Banks:** CIBC World Markets

**Legal:** Fasken Martineau DuMoulin LLP (advised lenders); Norton Rose Fulbright LLP (acted for Waterloo); Dentons Canada LLP (O&M contractor's counsel); Gowling Lafleur Henderson LLP (counsel to GrandLinq)

**Architect:** PBK Architects (station stop design)

**Vehicle Supplier:** Bombardier

**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. LRT offers the best long-term value for expanding the local public transit system.

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-km 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-km route of adapted bus rapid transit (aBRT) from Fairview Park Mall to the Ainslie Street Terminal in Cambridge, with four stops along Hespeler Road. The aBRT service will begin operating in early 2015.

Stage 2 will see the BRT line converted to LRT, creating a seamless 37-km ION 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**



**NEW**

**Location:** Kingston, Ontario

**Owner:** Providence Care Hospital

**Project/Construction Manager:** EllisDon and Infrastructure Ontario (joint construction managers)

**DBFM Team:** Integrated Team Solutions—EllisDon, Fengate Capital Management Ltd., Parkin Architects, Johnson Controls, and Scotia Capital

**Architect:** Parkin Architects and Adamson Associates JV

**Other:** Infrastructure Ontario (procurement lead); Entro (signage and wayfinding); MMM Group (sustainability and other services)

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

**Legal:** McCarthy Tétrault LLP (counsel to lenders); Gowling Lafleur Henderson LLP (counsel to consortium)

**Funding:** P3



Credit: Parkin Architects

This new leading-edge hospital will embody the principle of patient-centred care, where care is delivered through an interprofessional approach. Rather than separating psychiatric care from rehabilitation services, the two will be treated under the same roof, allowing for healthcare teams to work in collaboration to meet the physical, mental, and spiritual needs of each patient. The building will house 270 beds, 120 of which will be dedicated to mental health care. There will also be room on site to expand in order to meet future needs. Construction began in May 2014 and should be completed by fall 2016.

Credit: EDF EN Canada Inc. &gt;



## 61 Rivière du Moulin Wind Farm

**\$800 million** 

**2014 Rank:** 56

**Location:** MRC de Charlevoix and MRC du Fjord de Saguenay, Quebec

**Owner:** EDF EN Canada

**Engineer:** LVM (geotechnical and materials)

**Contractor:** Construction Énergie Renouvelable (EBC Inc., Transelec/Le groupe TCI and Construction LFG Inc.)

**Other:** Unibéton (Ciment Québec Inc.), Charl-Pol Saguenay

**Supplier:** REpower

**Funding:** Private

This 350-MW wind farm consisting of 175 turbines is expected to be the largest in Canada once completed. Located on remote unincorporated land northeast of Quebec City, its proponents plan to use existing logging roads to access the turbine construction sites. Hydro Quebec has agreed to buy the power produced by the farm, and will be building a 345-kV transmission line to link it to the power grid.

The project will be built in two phases. The first, consisting of 150 MW, was completed at the end of 2014. The second, 200 MW, will be complete by the end of 2015. Almost 300 workers will be on site during peak-time activities, and about 20 permanent jobs will be created to operate the wind farm by the end of 2015.

## 62 Union Station Revitalization Project

**\$796.4 million** 

**2014 Rank:** 62

**Location:** Toronto, Ontario

**Owner:** City of Toronto

**Project/Construction Manager:** Carillion Construction (contractor, construction management)

**Engineer:** NORR Limited Architects & Engineers, part of the Ingenium Group (design; prime consultant)

**Contractor:** Clifford Restoration (building envelope restoration)

**Other:** Arup Canada (4D modelling, pedestrian flow, construction coordination analyses), SPL Consultants (geotechnical consultant); Entro (wayfinding and signage); Engineering Harmonics Inc. (AV specialty consultants); FGMDA (heritage consultant)

**Architect:** DIALOG (executive architect of retail features)

**Supplier:** Canam (steel deck)

**Funding:** Public

- **Federal** \$164.5 million
- **Provincial** \$172 million
- **Municipal** \$463.5 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, inclusive of adjustments to the northwest PATH project, and additional funding was provided by Metrolinx and other parties to fund the increased cost.

The station's revitalization includes an expanded pedestrian concourse, entrance and exit improvements, new PATH connections, and the restoration and preservation of some of the station's heritage elements. The city also plans to create a new lower retail level below the station. Restoration includes the rebuilding of the support columns underneath the lowest level of the station, as well as the installation of a completely new mechanical and electrical system. The new mechanical/electrical system was required to bring the building up to code.

**63 Seatera Program****\$788 million** **2014 Rank:** 58**Location:** Southern Vancouver Island, British Columbia**Owner:** Capital Regional District**DBF Team:** Harbour Resource Partners—AECOM, Graham, CEI, SENA, Gracorp, and Michels Canada**Engineer:** Stantec (engineering/planning services); Westland Resource Group, Associated Engineering, Kerr Wood Leidal Associates (consultants)**Other:** Ernst & Young (business case); Stantec (business case and technical planning services); Levelton Consultants Ltd. (geotechnical)**Legal:** McCarthy Tétrault LLP**Funding:** Public

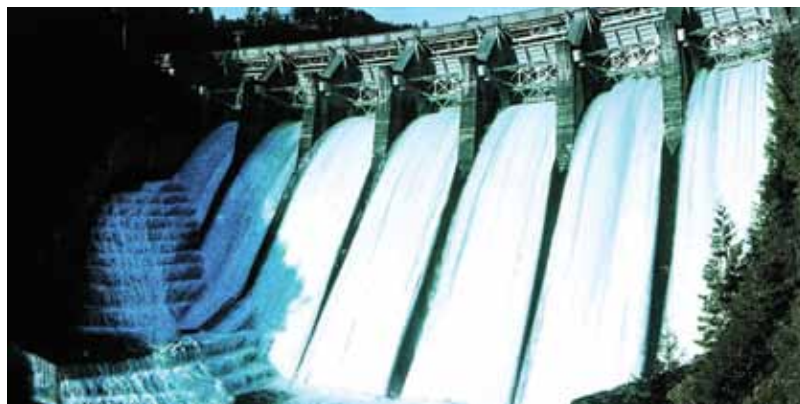
- **Federal** Federal Building Canada Fund, Green Infrastructure Fund, P3 Canada: \$253.4 million
- **Provincial** Provincial Ministry of Community and Rural Development: \$248 million
- **Municipal** Capital Regional District: \$287 million

The Seatera Program's goal is to implement an effective wastewater treatment solution for the municipalities of Victoria, Saanich, Oak Bay, Esquimalt, View Royal, Colwood, and Langford in British Columbia. Currently, wastewater from the core area and Greater Victoria receives only primary treatment before being dumped into the ocean via the Juan de Fuca Strait. In 2006, the BC Ministry of Environment mandated the region to bring in secondary wastewater treatment, and the Seatera Program is responsible for ensuring that the region is in line with new federal standards by the end of 2020.

At this point, the program has been paused while the CRD looks at other possible options, including alternate locations, a decentralized system, and tertiary treatment. Work continues on the replacement of the existing Craigflower Pump Station and the design for the Arbutus Road Attenuation Tank.

**64 Ruskin Dam and Powerhouse Upgrade****\$748 million** **2014 Rank:** 63**Location:** Mission, British Columbia**Owner:** BC Hydro**Engineer:** Golder Associates (right abutment); BC Hydro; MWH Americas Inc.**Contractor:** Flatiron, Dragados Canada**Other:** Hemmera (First Nation consultation and negotiation services)**Turbine Supplier:** Voith Hydro**Supplier:** HMI Construction, COH, Fortune Electric, ABB, L&S Electric of Canada**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.

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.

**Transportation Development**

Top 100 involves **2,624 km of new roads** and bridges at a cost of **\$12.2 million per km.**


 **Highway**

 **Bridge**

 **Airport**

 **Port**

Credit: BC Hydro



65

## Mica Generating Station Upgrade

**\$739 million**



**2014 Rank:** 60

**Location:** Revelstoke, British Columbia

**Owner:** BC Hydro

**Contractor:** Mitsubishi Electric Power Products

**Environmental Services:**

Klohn Crippen Berger (environmental manager); Levelton Consultants (air quality assessment); Hemmera (sub-consultant, input on restoration plan for remediation)

**Funding:** Public

• **Provincial:** \$739 million

Two additional 500-MW generators are being added to the Mica Generating Station, located north of Revelstoke on the Columbia River. The station, built in 1977, was intended to have six generators, but only four were initially installed. This project will bring it up to full capacity at 2,805 MW. To reliably deliver the additional generation to the grid, the project also required construction of a new capacitor station halfway along the Mica to Nicola 500-kV transmission line, near Seymour Arm. The capacitor station was completed in 2013.

Unit 5 came online in October 2014, and Unit 6 is expected to be operational by October 2015.

Credit: BC Hydro



66

## Interior to Lower Mainland Transmission Project

**\$725 million**



**2014 Rank:** 64

**Location:** Merritt to Coquitlam, British Columbia

**Owner:** BC Hydro

**Project/Construction Manager:** Hatch (construction program management)

**Engineer:** AECOM; SNC-Lavalin; Levelton Consultants Ltd. (materials engineering on behalf of contractor)

**Contractor:** Flatiron-Graham JV (design, procurement, construction for line); ABB (EPC contractor for series capacitor)

**Other:** Golder Associates

(environmental program management, geotechnical); Hemmera (First Nation consultation and negotiation support)

**Legal:** Fasken Martineau DuMoulin LLP (advised BC Hydro)

**Funding:** Public

• **Provincial:** BC Hydro: \$725 million

This 247-km, 500-kV transmission line will extend from Merritt to Coquitlam, delivering power to BC's Lower Mainland and Vancouver Island, which will deliver power to more than 1.4 million industrial, commercial, and residential customers. Increasing demand, changing patterns of use, and aging equipment have put pressure on the transmission grid, which continues to operate reliably but is reaching capacity in some areas. Conductor stringing commenced in summer 2014. The project will be completed and in service in 2015.

## 67 Union Station Infrastructure Renewal Program

**\$700 million** 

**2014 Rank:** 65

**Location:** Toronto, Ontario

**Owner:** Metrolinx

**Project/Construction Manager:** A JV with Hatch Mott MacDonald (lead), Parsons (previously Delcan), and IBI Group

**Other:** SPL Consultants (geotechnical consultant), WSP (design services); Morrison Hershfield (design engineer)

**Funding:** Public

The Union Station rail corridor is the 6.4-km hub of Toronto's transit network and consists of a complex arrangement of approach tracks, passenger platforms, and four interlockings at Cherry, Scott, John, and Bathurst streets. The corridor supports GO Transit commuter trains, Canadian Pacific, Canadian National, VIA, and ON Rail operations. It has 14 station tracks with platform access and more than 180 signals, 250 switch machines, 40 km 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. A new storage yard for 10 commuter trains was constructed, and an existing train storage yard refurbished. A new platform with associated underground passenger circulation facilities has also been completed inside the station. The program is expected to wrap up in 2019.



Credit: Metro Vancouver

## 68 Lions Gate Secondary Wastewater Treatment Plant

**\$700 million** 

**2014 Rank:** 97

**Location:** North Vancouver, British Columbia

**Owner:** Metro Vancouver

**Engineer:** AECOM; CH2M HILL

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

**Architect:** Miller Hull

**Funding:** Public

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 more than 90 per cent of organic matter and will be located 2 km east of the existing plant. Metro Vancouver will use a DBF 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



## 69 Marmora Pumped Storage Project

**\$700 million** 

**2014 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 near Peterborough, Ontario, the project will use cheaper, low rate off-peak energy to pump water into a raised reservoir, which will be located 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.

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 Ontario Power Authority to secure an energy services contract. They hope to complete the project by 2020.

## 70 Trans Labrador Highway Widening and Hard Surfacing

**\$683 million** 

**NEW**

**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 Mott MacDonald (pre-design, design, construction supervision, layout)

**Funding:** Public

The Trans Labrador Highway has been one of the most significant infrastructure projects in the province's history: 463 km have been paved and residents can now travel the more than 1,100 km from L'Anse aux Clair to Labrador City. 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.

## 71 BC Children & Women's Hospital/Health Centre Redevelopment

**\$678 million** 

**2014 Rank:** 66

**Location:** Vancouver, British Columbia

**Owner:** Provincial Health Services Authority

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

**Contractor:** Balfour Beatty Construction and Ledcor Design Build

**Other:** WSP (owner's rep); Turner & Townsend (lenders' technical advisor); Levelton Consultants Ltd. (geotechnical)

**Financiers/Banks:**  
Balfour Beatty  
Investments and Ledcor  
Developments Inc.

**Legal:** McCarthy  
Tétrault

**Architect:**  
ZGF Architects and  
CEI Architecture


**Supplier:**  
Canam  
(steel deck)

**Funding:** P3  
• **Provincial** \$534 million  
• **Private** Philanthropy  
BC Children's Hospital  
Foundation: \$144  
million toward Phase 2

This redevelopment project will provide a new eight-storey, 640,000-square-foot acute care centre, and the new facility will incorporate advances in medical technology, improve service efficiency, and create a better working environment for health professionals. It includes medical/surgical inpatient units, an emergency department, medical imaging and procedural suites, a hematology/oncology department, and a pediatric intensive care unit for BC Children's Hospital. The project will include private single-patient rooms, efficient design, environmental benefits, and the use of natural light and green space. The acute care centre is targeting LEED-Gold certification, achieving a high level of sustainability for the building.

The project was divided into three phases, including a renovation and relocation of BC Children's Hospital, renovation and expansion of BC Women's Hospital birthing program, and relocation of the Sunny Hill Health Centre for Children to the BC Children's Hospital.

## 72 Mosaic Stadium

**\$675 million** 

**NEW**

**Location:** Regina, Saskatchewan

**Owner:** City of Regina

**Project/Construction Manager:** PCL

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

**Other:** Mott MacDonald

**Funding:** P3

Part of the largest redevelopment in Regina's history, the future home of the Saskatchewan Roughriders will be centrally located at Evraz Place. Mosaic Stadium is to be an iconic structure not only for Regina but also for Saskatchewan and within the Canadian Football League. The location was chosen for its potential for future surrounding development, its proximity to downtown, and its easy access for both cars and pedestrians. The stadium will have a seating 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. The stadium has been designed to fit into the community by having a partially open roof; the other end is covered with a translucent canopy. The aerodynamic roof design reduces the effect of the region's cold northwestern winds.

Construction began in June 2014, and excavation, piling, and crane erection are complete. Substantial completion is expected in August 2016, and the first Roughriders game in the new stadium will be played in June 2017.

## 73 Juan de Fuca Power Cable

**\$665 million** 

**2014 Rank:** 68

**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

**Funding:** Private

This 550-MW electricity transmission line will be the first international power connection across the Strait of Juan de Fuca. The 50-km line will link Vancouver Island with the Olympia Peninsula region in Washington State, 30 km of which will be under water. The bidirectional 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, and commercial contracts with suppliers and users need to be arranged. The cable is expected to be operational by 2017.

## 74 Grande Prairie Regional Hospital

**\$621.4 million** 

**2014 Rank:** 71

**Location:** Grande Prairie, Alberta

**Owner:** Alberta Health Services

**Project/Construction Manager:** Graham (construction manager)

**Engineer:** Stantec; MMM Group (mechanical and electrical design)

**Architect:** DIALOG (prime consultants); Stantec with HOK (design); Stantec (landscape architecture); ISL Engineering and Land Services

**Funding:** Public

• **Provincial** Alberta Health Services: \$621.4 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 spring 2017.

## 75 Regina Wastewater Treatment Plant

**\$611 million** 

**NEW**

**Location:** Regina, Saskatchewan

**Owner:** EPCOR Utilities

**Project/Construction Manager:** Graham

**DBFOM Team:** EPCOR Water Services Inc., Graham, Lockerbie Stanley Inc./Aecon, Stantec, Gracorp Capital Advisors

**Engineer:** Stantec

**Contractor:** Graham, Lockerbie Stanley Inc.

**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.

Construction has begun, and as of August 2014, EPCOR is the wastewater provider for the City of Regina, taking on operations for the existing facility until the new facility is substantially complete in December 2016.



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- **Bert Clark**, President & CEO, Infrastructure Ontario

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**Cocktail reception:** 6 – 7 p.m.

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## 76 Rogers Place Arena Project

**\$606.5 million** 

**2014 Rank:** 72

**Location:** Edmonton, Alberta

**Owner:** City of Edmonton

**Project/Construction Manager:**

ICON Venue Group

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

**Contractor:** PCL (construction)

**Other:** BTY Group (cost consultant)

**Architect:** 360 Architecture;  
DIALOG (sub-consultant)

**Funding:** P3

• **Federal** \$7 million

• **Provincial** \$32 million

• **Municipal** \$279 million

• **Private** \$288.5 million

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 LRT 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. This phase will take approximately one year to complete. The entire build is expected to take 2.5 years, with the arena opening in fall 2016.

## 77 North Island Hospitals Project

**\$606.2 million** 

**2014 Rank:** 75

**Location:** Campbell River and Comox, British Columbia

**Owner:** Vancouver Island Health Authority

**DBFM Team:** Tandem Health Partners—Balfour Beatty Capital, Gracorp Capital Advisors Ltd., Connor Clark & Lunn GWest Traditional Infrastructure LP, Graham, Balfour Beatty with Farmer Construction Ltd., Stantec Inc., Blue Cottage Consulting, Honeywell, and Balfour Beatty Communities

**Engineer:** WSP (owner's engineer)

**Other:** DIALOG (compliance consultant)

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

**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.

## 78 Gordon M. Shrum Generating Station Refurbishment

**\$600 million** 

**2014 Rank:** 86

**Location:** Peace River, British Columbia

**Owner:** BC Hydro

**Turbine Supplier:** Voith Hydro


**Supplier:** Andritz Hydro (rotor poles)

**Funding:** Public

• **Provincial** BC Hydro: \$600 million

This generating station, located at the W.A.C. Bennett Dam, provides 24 per cent of BC Hydro's hydroelectric power. Several capital projects are underway to replace the station's 50-year-old equipment including the replacement of five turbines. Three have been replaced and returned to service, while the fourth is in progress. Each replacement takes about nine months, and all are 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.

## 79 Ontario East-West Transmission Tie

**\$600 million** 

**NEW**

**Location:** Thunder Bay to Wawa, Ontario

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

**Legal:**

Gowling

Lafleur

Henderson

LLP (counsel to NextBridge)

**Funding:**

Private

This transmission project is planned to consist of a new, 430-km, double-circuit, 230-kV transmission line, paralleling an existing transmission line corridor, which connects the Wawa Transformer Station to the Lakehead Transformer Station near Thunder Bay. Access roads as well as temporary laydown and work areas will be built to accommodate its construction. The need for the project was established by the Ontario Power Authority to provide a reliable electricity supply to northwestern Ontario and is expected to provide total eastbound and westbound capabilities in the order of 650 MW.

The EA has begun, and a series of public open houses took place in August 2014. The proposed terms of reference have been accepted by the Ontario Ministry of the Environment and Climate Change. The targeted in-service date is the first half of 2018.

## 80 Winnipeg Capital Integration Project

**\$590 million**



**NEW**

**Location:** Winnipeg, Manitoba

**Owner:** City of Winnipeg

**Consulting Engineer:** Dillon (lead consultant for Phase I, II, and III); Landmark Planning & Design (public consultation); McGowan Russell Group (active transportation, station design, station areas, landscaping)

**Funding:** P3

- **Federal** \$140 million (requested)
- **Provincial** \$225 million
- **Municipal** \$225 million

Officially called the Capital Integration Project, this will be 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.

The project is currently in the procurement phase and the RFQ was issued in fall 2014, and the RFP will be issued in early 2015. The successful proponent would likely be awarded in early 2016. Construction is expected to take from early 2016 to late 2019. Operator training and facility commissioning will then be carried out, with full operation expected to commence in April 2020.

## 81 New Hospital in Corner Brook

**\$588 million**



**NEW**

**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:** Halsall (structural engineers, sustainability consultants)

**Contractor:**

Marine Contractors (site excavation and grading); Brook Construction (underground concrete water reservoir)

**Other:** WSP (heliport planning)

**Funding:** Public

This new hospital in western Newfoundland will be a health-care facility based on best practices in hospital design and construction. Site preparation activities are underway, and this project has entered the design phase. Construction on the new long-term care facility will begin in 2015, and construction of the new hospital will begin in 2016. The hospital is expected to be completed by 2019.

## 82 Pointe Du Bois Spillway Replacement Project

**\$560 million**



**2014 Rank:** 78

**Location:** Pointe du Bois, Manitoba

**Owner:** Manitoba Hydro

**Project/Construction Manager:** Manitoba Hydro

**Engineer:** Levelton Consultants Ltd. (materials engineering on behalf of contractor)

**Contractor:** Peter Kiewit Infrastructure

**Architect:** KGS Group

**Supplier:** Alstom (spillway gate design, manufacture, and supply)

**Funding:** Public  
• **Provincial** Manitoba Hydro: \$560 million

Manitoba Hydro is replacing and upgrading various parts of its Pointe du Bois Generating Station, a 77-MW hydroelectric dam on the Winnipeg River, to improve safety for both the public and workers. The original project scope called for replacing both the generating station and the spillway, but in 2009, it was decided that the spillway alone would be replaced.

The plan was revised in 2012, following which Manitoba Hydro received new regulatory approval, and site excavation began late that year. Concrete work on the spillway structure is complete and the gates and operating mechanisms have been installed. Work continues on construction of the new main dam, which will link the spillway to the existing powerhouse, and excavation of new spillway channels is underway. The project is scheduled for completion by November 2015.

## 83 Armow Wind Farm

**\$550 million**



**2014 Rank:** 79

**Location:** Kincardine, Ontario

**Owner:** Pattern Renewable Holdings and Samsung Renewable Energy

**Project/Construction**

**Manager:** Golder Associates

**Environmental Services:** Natural Resource Solutions Inc.

**Other:** MMM Group (geomatics services); Golder Associates (renewable energy approval, consultation/engagement, archaeology, cultural heritage and GIS)

**Turbine Supplier:** Samsung Renewable Energy; Siemens

**Funding:** Private

This wind farm will use 92 turbines to produce 180 MW of energy. The Municipality of Kincardine had raised numerous concerns about the project's safety, specifically in relation to the proximity of turbines to the Kincardine Airport. The development agreement that resulted has been called state of the art in Ontario, with a generous community benefit package which should be a substantial boon to the municipality. All low-voltage collector lines on private property will be buried where feasible, and a tree preservation and replacement plan is also in effect.

The project survived an appeal to the Environmental Review Tribunal in May 2014 and continues as planned. Construction started in fall 2014 and is expected to wrap up in 2015.

## 84 Southeast Collector Trunk Sewer

**\$546 million**

**2014 Rank:** 80

**Location:** York and Durham regions, Ontario

**Owner:** Regional Municipality of York

**Project/Construction Manager:** A JV of Hatch Mott MacDonald and AECOM (detailed design and construction management)

**Contractor:** Zublin/Strabag (prime contractor, tunnel contractor); Zublin (subcontractor, shaft temporary support and base plugs); Maple Reinders (subcontractor, facilities contractor)

**Environmental Services:** AECOM (integrated EA)

**Other:** Monteith and Sutherland (survey); REA (health and safety); CRA (geotechnical and hydrogeological); LVM (geotechnical engineer, materials testing, quality assurance)

**Tunnel Boring Machine Supplier:** Caterpillar

**Supplier:** Armtec Holdings (precast concrete tunnel lining); Biorem (biofilters and bioscrubbers); Doka (formwork); BASF (ground conditioning); Miller Group (concrete and bentonite); Harris Rebar (rebar supply and installation)

**Funding:** Public

• **Municipal**  
\$546 million

Although this project has been in development since 2002, the EA was not approved until early 2010. The earth pressure balance tunnel boring machines, segmental precast concrete tunnel lining, and the biofilters and bioscrubbers used for odour control were all procured in advance by the owner. Hatch Mott MacDonald and AECOM (in a joint venture) completed the design of the tunnel, shafts, and surface facilities and are administering the construction contract. Project design involves a 15-km-long, 3,000-millimetre-diameter tunnel with 17 access shafts ranging between four and 48 metres in depth and four to 14 metres in diameter.

Construction is underway, with tunnelling completed and shafts and facilities being fitted. Live flows were commissioned by the end of 2014. The project is scheduled for completion by 2016.

## 85 Queen Elizabeth Power Station Expansion

**\$532 million**

**2014 Rank:** 82

**Location:** Saskatoon, Saskatchewan

**Owner:** SaskPower

**Construction Manager:**  
Alberici Western Constructors  
and Burns & McDonnell JV

**Environmental Services:**  
Golder Associates

**Funding:** Public

• **Provincial** SaskPower: \$532 million

This power station expansion will add 205 MW to the grid, enough capacity to power an additional 205,000 homes. The original facility was commissioned in 1959 with a net capacity of 430 MW. The project will see the D Plant at the natural gas facility converted from simple cycle to combined cycle, which will make it 10 to 15 per cent more energy efficient. This type of electricity generation is ideal for meeting peak loads, such as hotter periods in the summer or colder periods in the winter.

Civil works and piling is complete, as well as major equipment foundation. Site construction is expected to be complete by July 2015 and the new plant commissioned in September 2015.

## 86 CIBC Pan Am and Parapan Am Athletes' Village

**\$514 million**

**2014 Rank:** 81

**Location:** Toronto, Ontario

**Owner:** Infrastructure Ontario

**Project/Construction Manager:**  
Dundee Kilmer Developments—  
Dundee Realty Corp. (equity investor, developer); KD Infrastructure L.P. (equity investor, developer); EllisDon Leducor PAAV Inc. (design-builder)

**Engineer:** Halsall  
(structural engineers, sustainability consultants)

**Other:** BTY Group  
(independent certifier)

**Legal:** Fasken Martineau DuMoulin LLP (advised lenders); Gowling Lafleur Henderson LLP

**Architect:** Kuwabara Payne McKenna Blumberg Architects, architectsAlliance, Daoust LeStage, TEN Arquitectos, and MacLennan Jaunkalns Miller Architects

**Supplier:**  
Honeywell (HVAC and building automation system)

**Funding:** P3

The Toronto 2015 Pan Am Athletes' Village is being constructed on an 80-acre site next to the Don River in Toronto's West Don Lands. During the games, the village will be home to up to 10,000 athletes, coaches, and team officials; attract 250,000 tourists; and create approximately 5,200 jobs across the Greater Toronto Area. It will incorporate a full range of conveniences and amenities. After the Games, the Village area will become the Canary District, a mixed-use, inclusive, and pedestrian-friendly riverside community that will include market condos and townhomes as well as affordable housing, a new YMCA, and a George Brown College student residence.

Construction has continued this year since the topping-off ceremony in December 2013. The project was nearing completion by the end of 2014, and the village will be ready to turn over to the organizing committee in early 2015.

## 87 Dorval Interchange

**\$507 million**



**2014 Rank:** 84

**Location:** Dorval, Quebec

**Owner:** Transports Québec

**Engineer:** SNC-Lavalin (engineer and program manager); consortium of WSP, Dessau, and Tecult

**Other:** WSP (designer)

**Supplier:** Structal-Bridges (steel fabricator)

**Funding:** Public

• **Provincial** \$507 million

This project consists of improvements to ground transportation infrastructures which will eventually do away with the Dorval Circle and connect Pierre Elliott Trudeau International Airport directly to Highway 20.

Some of the work has already been completed or is underway, while other aspects of the project are still being planned. The project is expected to be completed in stages between 2015 and 2019.

## 88 Wilson Facility Enhancement and Yard Expansion

**\$500 million**



**2014 Rank:** 85

**Location:** Toronto, Ontario

**Owner:** TTC

**Project/Construction**

**Manager:** TTC; Bondfield Construction (construction management)

**Engineer:** AECOM, Hatch Mott MacDonald, TTC

**Supplier:** Powell, Nedco, Nortrak, Tomlinson, Thales, Ansaldo, Twinco, Dufferin Concrete

**Funding:** Public

• **Municipal** TTC: \$500 million

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

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.

## 89 Leslie Barns and Connection Track Project

**\$497 million**



**NEW**

**Location:** Toronto, Ontario

**Owner:** TTC

**Contractor:** Pomerleau

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

**Architect:** Strasman Architects, Gannett Fleming, Brown and Storey Architects in assoc. with Scott Torrance Landscape Architect

**Funding:** Public

• **Municipal** TTC: \$497 million

The TTC, in cooperation with the City of Toronto and Waterfront Toronto, 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 and service about half of Toronto's new streetcar fleet; major upgrades to underground infrastructure on Leslie Street from Commissioners to Queen streets; 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 expected completion date for Leslie Street construction is Spring 2015.

## 90 Peel Memorial Centre for Integrated Health and Wellness

**\$491 million**



**NEW**

**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) Ltd.

(developer); PCL Constructors Canada Inc.

(constructor); Diamond Schmitt Architects and

RTKL Associates (architects); RBC Capital Markets (financial advisor); Honeywell (facilities manager)

**Other:** Infrastructure Ontario (procurement lead); Entro (signage and wayfinding); MMM Group (geomatics and compliance services)

**Legal:** Fasken Martineau DuMoulin LLP (advised lenders)

**Funding:** P3

• **Private** \$49.1 million

This new 350,000-square-foot facility will be built on the site of the former Peel Memorial Hospital, which has since been closed and demolished. 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. It will take up to three years to complete and is expected to relieve some of the traffic at Brampton Civic Hospital, one of the busiest health centres in Ontario.

Prep work has begun on the site south of Queen Street East on the edge of the downtown core. Construction is expected to be completed in fall 2016.

## 91 Women's College Hospital Redevelopment

**\$460 million** 

**2014 Rank:** 91

**Location:** Toronto, Ontario

**Owner:** Women's College Hospital

**DBFM Team:** Women's College Partnership—Bilfinger Berger Project Investments, Black & McDonald/HSG Zander, Perkins Eastman Black/IBI Architects, The Walsh Group/Bondfield Construction

**Other:** Infrastructure Ontario (procurement manager and project development); MMM Group (mechanical and electrical compliance); Engineering Harmonics Inc. (AV specialty consultants); Siemens (service contract for installed base)

**Financiers/Banks:** Banco Espirito Santo de Investimento, Credit Agricole Corporate, ING Capital, Société Générale.

**Legal:** McCarthy Tétrault LLP (advising Infrastructure Ontario and Women's College Hospital)

**Architect:** Perkins Eastman Black/IBI Architects

**Funding:** P3

This hospital traces its history to 1883, and the Grenville Street complex was built in phases between the 1930s and the 1970s. The 400,000-square-foot replacement facility is being built in two phases on the current Grenville Street site. The redevelopment is targeting LEED-Silver certification and will replace all existing buildings, consolidating most hospital services into one location. Women's College Hospital will have no patient beds; all of its programs are delivered on an outpatient basis.

Phase 1 was completed and occupied in May 2013, and demolition of the old structure is complete. The project is scheduled for completion in March 2016.

## 92 Extension of Autoroute 35

**\$460 million** 

**2014 Rank:** 92

**Location:** MRC du Haut-Richelieu and MRC de Brome-Missisquoi, Quebec

**Owner:** Transports Québec

**Contractor:** Neilson-EBC consortium, L.A. Hébert, DJL

**Other:** LVM (quality assurance), WSP (main designer)

**Supplier:** Holcim Canada (cement)

**Funding:** Public

- **Federal** \$57 million (Canada Strategic Infrastructure Fund: \$44 million; Border Infrastructure Fund: \$13 million)

- **Provincial** Transports Québec: \$403 million

This 37.5-km extension is being added from Saint-Jean-sur-Richelieu to the Vermont border and is divided into four segments. Segments 1 and 2 are underway, while segments 3 and 4 are still being planned.

The extension, which began five years ago, was supposed to be completed in 2013. Quebec Premier Pauline Marois remains committed to completing the Autoroute 35 highway project despite provincial budget cuts to transportation. The first section of the extension south of St. Jean opened in fall 2014, with the final stretch to Vermont slated for completion in 2017.

## 93 Union-Pearson Express Spur Line

**\$456 million** 

**2014 Rank:** 93

**Location:** Toronto, Ontario

**Owner:** Metrolinx

**Engineer:** Hatch Mott MacDonald

**DBF Team:** AirLINX Transit Partners—Aecon and Dufferin Construction

**Legal:** McCarthy Tétrault LLP (National Bank and lenders); Borden Ladner Gervais LLP (Metrolinx and Infrastructure Ontario); McMillan LLP (AirLINX Transit Partners)

**Vehicle Supplier:** Sumitomo

**Other:** Arup (design advisor for screen doors/transportation consultant for business case)

**Funding:** P3

- **Provincial** Ministry of Transportation capital allotment to Metrolinx: \$456 million



A key component of Metrolinx's regional transportation plan, this dedicated airport express rail service will launch in spring 2015. It will connect Toronto's Union Station to Toronto Pearson International Airport, the two busiest transportation hubs in Canada. Trains will depart every 15 minutes, stopping at both the Bloor and Weston GO stations and arriving at the airport within 25 minutes.

A new 3-km spur line is being built to connect the existing GO Kitchener rail corridor and Pearson's Terminal 1. The spur rises above major highways and roadways, with a highest elevation of about 28 metres. Upgrades to the 22 km of track shared with GO Transit Kitchener line trains were completed in 2014 as part of Metrolinx's Georgetown South project (previously a Top 100 project). New stations are now under construction at Union Station and Terminal 1, with significant upgrades to the existing Bloor and Weston GO Stations to enhance accessibility and capacity. All elements of construction are currently underway.

## 94 Hanlan Water Project

**\$450 million** 

**2014 Rank:** 89

**Location:** Mississauga, Ontario

**Owner:** Region of Peel

**Engineer:** CH2M HILL (prime consultant for detail design and contract administration); MMM Group (detailed design consultants); The Municipal Infrastructure Group (value engineering for preliminary design); GHD (value engineer); Parsons Brinckerhoff (value engineer)

**Contractor:** McNally International (Contract 1, Lakeshore and Dixie roads to Golden Orchard Drive); T2DMP (Contract 2, Dixie Road from Golden Orchard Drive to Eastgate Parkway); Technicore Southland Mole JV (Contract 3, Eastgate Parkway and Tomken and Cawthra roads)  
**Environmental Services:** AECOM

**Other:** AECOM (preliminary design report); WSP (consultant); SPL Consultants (geotechnical consultant, materials testing, inspection consultant); Golder Associates (geo-rock engineering-mechanics)

**Supplier:** Dufferin Concrete, Dufferin Aggregates, Ontario RediMix and Holcim

**Funding:** Public

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

The Hanlan feedermain will run approximately 14.5 km 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 6 km 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.

## 95 Kicking Horse Canyon Project – Phase 4

**\$440 million** 

**2014 Rank:** 70

**Location:** Golden, British Columbia

**Owner:** British Columbia Ministry of Transportation and Infrastructure

**Legal:** McCarthy Tétrault LLP

**Funding:** Public

This is a long-term project that involves upgrades to the Highway 95 intersection, and a significant realignment of more than 4 km of the Trans-Canada Highway through the Kicking Horse Canyon to improve traffic operations and 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.

## 96 Route 389 Improvement Program

**\$438 million** 

**2014 Rank:** 94

**Location:** Baie-Comeau, Quebec

**Owner:** Transports Québec

**Project/Construction Manager:** AECOM

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

**Funding:** Public

• **Provincial** Transports Québec: \$438 million

This 570-km route extends north from Baie-Comeau to Fermont at the Labrador border, passing the Manicouagan Reservoir. It is significant as the primary land route to Labrador as well as for access to the hydroelectric dams and power stations along the Manicouagan River. The project involves resurfacing and other improvements to the highway, including building 55.8 km 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. The MTQ 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.

## 97 Upper Lillooet Hydro Project

**\$434 million** 

**2014 Rank:** 96

**Location:** Boulder Creek and Upper Lillooet River, British Columbia

**Owner:** Creek Power Inc.

**Project/Construction Manager:** Innergex Renewable Energy

**Contractor:** Westpark Electric Ltd., CRT Construction, EBC Inc.

**Other:** Lil'wat First Nation

**Legal:** McCarthy Tétrault LLP (advising Creek Power)

**Funding:** Private

This hydro project includes two run-of-river generation facilities located in the Pemberton Valley: 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.

The construction is scheduled from October 2013 to the end of 2016, when commercial operation is expected to commence.

## 98 Canadian Forces Base Esquimalt A and B Jetty Recapitalization

**\$430.6 million**



**NEW**

**Location:** Constance Cove, British Columbia

**Owner:** Department of National Defence

**Contractor:** Scansa Construction (utility corridor)

**Other:** AMEC Consulting (design authority for A jetty); Stantec (design authority for B jetty)

**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. This project will provide sufficient operational berthing space for four Halifax-class frigate, two Arctic/offshore patrol ships, one Queenston-class joint support ship, and one Victoria-class submarine. Significant portions of the dockyard's service-support infrastructure will be recapitalized: both existing jetty cranes will be replaced, and all utility infrastructure to the site will be renewed. The project will also include rebuilding roads and sidewalks as well as the expansion and improvement of the jetty-apron area.

## 99 Jewish General Hospital – Pavilion K

**\$426 million**



**2014 Rank:** 95

**Location:** Montreal, Quebec

**Owner:** Jewish General Hospital

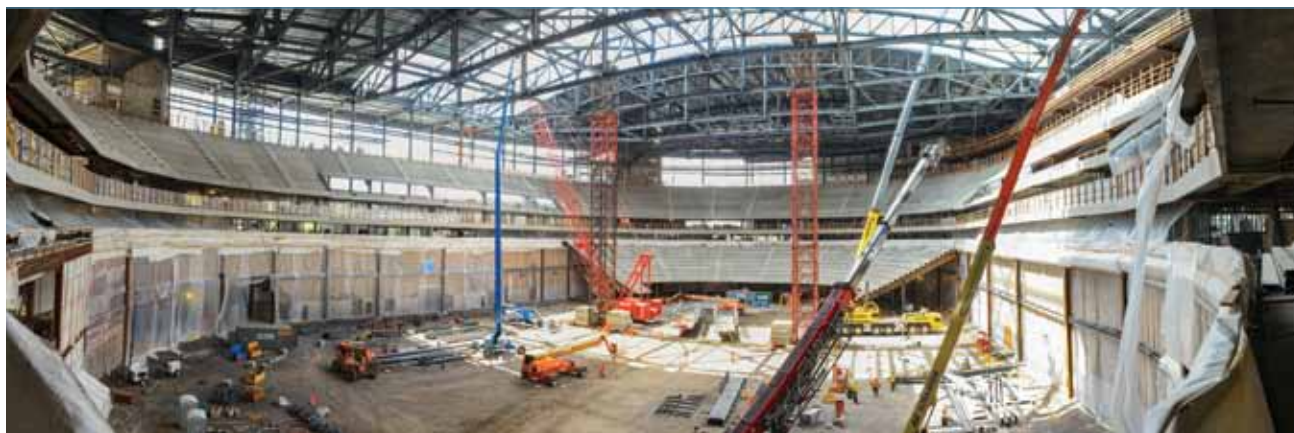
**Architect:** GKC, Jodoin Lamarre Pratte, and Marosi Troy Architects JV

**Supplier:** Demix Beton (concrete); Honeywell (HVAC and building automation system); Siemens (fire installed base)

**Funding:** Public/Private

This 12-storey project's first phase featured a state-of-the-art emergency department to address wait times and patient flow issues. Once entirely completed, Pavilion K will focus on patients requiring emergency treatment, surgery, or intensive, coronary, or neonatal intensive care. They plan to eliminate all three and four-bed rooms throughout the hospital, which will be replaced with 450 private (one-bed) and semi-private (two-bed) rooms.

Construction began in October 2010, and although it's on schedule and expected to be completed by December, medical equipment must first be put in place and tested before patients can be treated. The emergency department opened in February 2014, and plans call for Pavilion K to welcome its first patients in January 2016.



Credit: City of Quebec

## 100 Quebecor Arena

**\$400 million**



**2014 Rank:** 98

**Location:** Quebec City, Quebec

**Owner:** Quebec City

**Engineer:** Équipe intégrée SAGP (engineering and architecture); WSP (owner's advisor); Pomerleau (construction management); SNC-Lavalin (engineer and program mgmt)

**Legal:** Norton Rose Fulbright LLP (represented Quebecor)

**Supplier:** Groupe ADF (steel structure); Epsilon Concept (exterior envelope); Daharpro/Grondin/MGP (interior finishes); Canam (joists and steel deck)

**Funding:** Public/Private

- **Provincial** \$200 million
- **Municipal** \$152 million
- **Private** Quebecor: \$33 million for naming rights (\$63.5 million if an NHL team is secured)
- **Advanced** seat sales: \$15 million

This modern, 18,000-seat NHL-quality arena is under construction to give Quebec City a boost in the NHL expansion market. Quebec-based media firm Quebecor has purchased the naming rights to the arena, and during construction and for 25 years after, Quebecor has promised to work with provincial and municipal governments to ensure it is both an economic and cultural benefit to the city.

Construction began in the fall of 2012 and is ongoing. The roof is now closed and the exterior envelope is being completed. The work will now concentrate on the interior until the end of the project.



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