

Canada



Name: Tunnelling Association of Canada (TAC)

Type of Structure: Federally incorporated not-for-profit society

Number of Members (2020): 404 (288 full, 59 corporate, 11 retired, 46 student)

Board of Directors (2020):

Officers: Erik Eberhardt - President, Rick Lovat - Immediate Past President, Bruce Downing - Vice President West, Steve Skelhorn - Vice President East, Michelle Richards - Treasurer, Andre Solecki - Secretary

Directors: Stephanie Robillard – British Columbia Region, Remco Kleinlugtenbelt – Alberta Region, Jason Mann - Manitoba and Prairies Region, Dan Ifrim – Ontario Region, Jean Habimana - Québec and Maritimes Region, Nichole Boulton, Andrew Caruana, Mark Diederichs, Connor Langford, Boro Lukajic, Seamus Tynan, Leila Sunderani

ASSOCIATION ACTIVITIES DURING 2020 AND TO DATE

After starting 2020 with a number of in-person events and talks organized by our local chapters and TAC Young Members Group (TACym), TAC transitioned to organizing online events with the confirmation of the worldwide COVID-19 pandemic. TACym helped lead this transition by initiating a webinar series in May of 2020. Subsequently, TACym and the TAC Ontario and BC Chapters have offered 13 online webinars, some jointly with other national groups and tunnelling organizations. Presentations included:

- **04/28/2020** – Tunnel Face Pre-conditioning Using Destress Blasting
- **06/25/2020** – Theoretical Gardiner Expressway Replacement Tunnel Project
- **07/16/2020** – Time-dependent Deformation of Shafts and Tunnels in the Greater Toronto Area
- **08/13/2020** – 6th Century BC Eupalinos Tunnel Excavated Simultaneously from Both Ends
- **09/03/2020** – Excavation Damage Zone Prediction for Deep Repository Engineering
- **09/24/2020** – Applying UAV and LIDAR Scanning Technologies to an Underground Gold Mine
- **09/28/2020** – Lessons Learned as a Trenchless Litigation Expert and Designer
- **10/29/2020** – Cost Analysis on Greater Toronto Area Tunnelling Projects
- **11/17/2020** – Use of a P3 D-B-F-M Contract and a Large Diameter Tunnel to Address Interstate Flooding Problems
- **12/10/2020** – EPB Pipejacking Through Challenging Ground Conditions



- **01/28/2021** – Risk and Risk Management in Underground Projects
- **02/25/2021** – Current and Future Tunnel Projects in Ontario
- **03/04/2021** – 2020 TAC Undergraduate & Dan Eisenstein Memorial Scholarship Presentations.

COVID-19 limitations on meetings in 2020 also resulted in the postponement of TAC's 2020 Conference and Awards Banquet. However, TAC organized a virtual Annual General Meeting for our membership, which also included the announcement and highlight videos for our 2020 TAC Achievement Award winners. The following

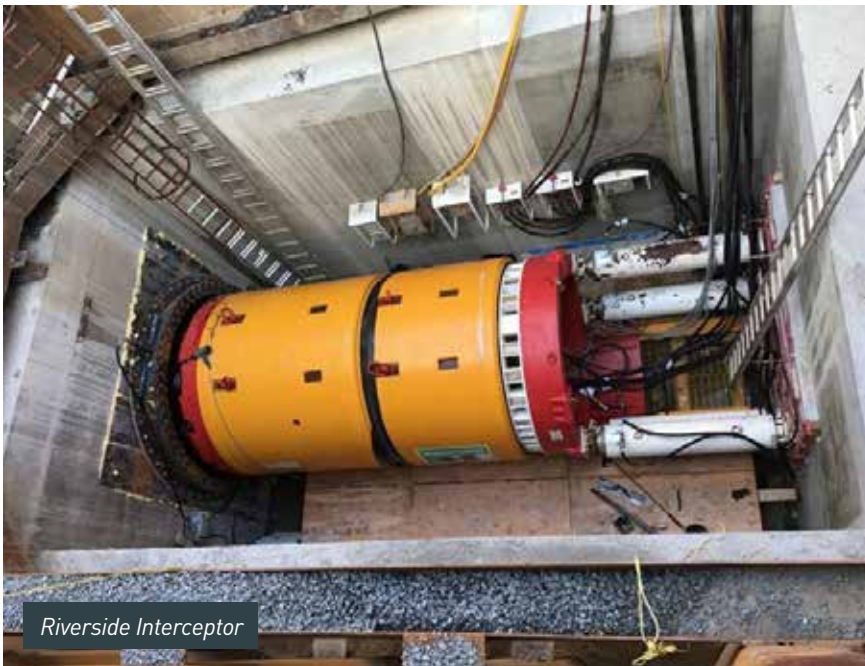
awards were presented:

- Lifetime Achievement Award – Richard Staples
 - Young Tunneller of the Year Award (new in 2020) – Connor Langford and Andre Solecki
 - Canadian Innovation Initiative Award – Harbour Resource Partners, an AECOM, Graham Construction and Michels Canada joint venture in partnership with the Capital Regional District (CRD), for the "McLoughlin Point Wastewater Treatment Plant Cross Harbour Force Main and Outfall"
 - Canadian Project of the Year (Up to \$100M CAD) – Ward & Burke Microtunnelling, Les Entreprises Michaudville, CIMA+, Golder, Hatch, ABS and la Ville de Saint-Lambert for the "Riverside Stormwater Interceptor"
 - Canadian Project of the Year (Over \$100M CAD) – Crosslinx Transit Solutions, an ACS-Dragados, AECOM, EllisDon and SNC Lavalin joint venture, along with Dr. Sauer and Partners, gGravity, Metrolinx, Thurber Engineering, IBI Group and Dufferin Concrete for the "Eglinton Crosstown LRT Mined Stations (Laird, Avenue and Oakwood)"
 - Photo of the Year Award – Hatch for "Ashbridges Bay Treatment Plant Outfall Shaft & Starter Tunnel"
 - Dan Eisenstein Memorial Scholarship – Madison Kennedy
 - TAC Undergraduate Scholarship (new in 2020) – Graham Swarbick
- Full 2020 TAC Achievement Award details and videos are posted on the TAC website at https://www.tunnelcanada.ca/awards_2020.php.

CANADIAN TUNNELLING ACTIVITIES Eastern Canada Snapshot

The 2020 market was strong with numerous projects keeping local contractors busy as well as attracting more international competition from the US and from around the world. Examples of key projects currently in progress include:

- Hwy 401 Rail Tunnel (Greater Toronto and Hamilton Area, Ontario): Design-Build-Finance project with a contract value of \$116.9M involving two tunnels being excavated less than 3m underneath two busy highways. Anticipated to be completed in 2021.
- Coxwell Bypass (Toronto, Ontario): 6.3m diameter and 10.5km long TBM-excavated tunnel, is the first project of Toronto's \$3bn Wet Weather Flow Master Plan that will prevent combined



Riverside Interceptor

Eglinton Crosstown LRT

sewer overflows from entering Lake Ontario and the Don River. Anticipated completion in 2024.

- Ashbridges Bay Outfall (Toronto, Ontario): \$300M project involving a 7m diameter, 3.5km long TBM-excavated outfall tunnel underneath Lake Ontario. Anticipated completion in 2024.
- Bassin Lavigne (Montréal, Québec): \$38M project involving 1.9km of tunnelling to provide supply and connecting tunnels to a 42m diameter, 25m deep retention basin for reducing wastewater overflow.
- Lafontaine Tunnel (Montréal, Québec): Design-Build-Finance project with a contract value of \$1.14bn to renovate the 53-year-old, 1.5km long, double tube immersed, Louis-Hippolyte-Lafontaine tunnel.
- Réseau Électrique Métropolitain, REM (Montréal, Québec): \$6.5bn light rail network project with 26 stations, 67km of track, and two major tunnels including a 3km long TBM excavated tunnel to be driven underneath the Montreal Airport runways. The project is made up of five segments with the first expected to be commissioned in 2022 and the last in 2024.

Upcoming Eastern Canada projects include the Montreal Blue Line in Québec, the East Brampton Watermain in Ontario, as well as much awaited subway work on the Scarborough extension (6km), Eglinton Crosstown West extension (9.2km), Yonge Street extension (7.4km) and Ontario line (16km with 9km underground); procurement activity is currently underway for each of these subway projects.

In addition to these large diameter

tunnelling projects, numerous microtunnelling projects are being constructed throughout Eastern Canada.

Western Canada Snapshot

The 2020 market was equally strong across the western Canadian provinces, with numerous projects by local contractors and international joint ventures. Examples of key projects currently in progress include:

- Combined Sewer Overflow Relief Project (Winnipeg, Manitoba): Three current projects with contract values of \$43M total, involving significant tunnelling components to help reduce flooding and protect water quality in rivers and Lake Winnipeg by reducing the frequency of combined sewer overflows.
- Valley Line LRT (Edmonton, Alberta): P3 project valued at \$1.95bn, that will add 27km to the current LRT and includes construction of two 500m long soft ground NATM tunnels. Expected to be completed by the end of 2021.
- Green Line LRT (Calgary, Alberta): \$4.9bn project to add 29 stations and 46km to the existing LRT and includes over 3km of tunnel in the City's downtown area. Construction has just begun and is expected to be completed in 2027.
- Inglewood Sanitary Trunk Project (Calgary, Alberta): \$76M project involving 4km of microtunnelling with 2400mm diameter. Project completion expected in 2021.
- North Shore Wastewater Conveyance (North Vancouver, BC): \$1bn project that includes 520m intake tunnel to move wastewater from the existing

Lions Gate Wastewater Treatment Plant to the new North Shore Wastewater Treatment Plant, and to move the treated wastewater from the new plant to the existing outfall. Construction is expected to be completed in fall 2021.

- Second Narrows Water Supply Tunnel (Vancouver, BC): \$430M project involving a 6.5m diameter, 1.1km long TBM excavated water conveyance tunnel under the Burrard Inlet, as part of Metro Vancouver's efforts to improve water security in the event of a large earthquake. Construction is expected to be completed in 2023.
- Annacis Island Wastewater Treatment Plant Outfall (Vancouver, BC): \$184M project involving an 800m long TBM excavated tunnel between two 40m deep shafts. The project showcases a challenging marine operation to complete the tunnel drive under the river and construct a riser structure and diffuser for the outfall.
- Broadway Subway Project (Vancouver, BC): \$2.8bn project to add a 6km TBM bored subway extension to the existing Millennium Line Skytrain with 6 new stations. Construction is expected to be completed in 2025. Preliminary planning is also underway to further extend the line an additional 7km to the University of British Columbia.
- Trans Mountain Pipeline Burnaby Mountain Tunnel (Burnaby, BC): \$12.6bn pipeline project that includes a 4m diameter, 2.6km long TBM tunnel to relocate an existing 24-inch delivery pipeline and replace with three 30-inch pipelines. Tunnelling is expected to be completed in 2022.