

Tunnelling Association of Canada Ontario Chapter

Current and future tunnelling projects in Ontario

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PROJECTS IN PRECONSTRUCTION & CONSTRUCTION PHASE

- Coxwell Bypass
- Ashbridges Bay Outfall
- Hwy # 401 Rail Tunnel Project, Toronto, Ontario
- MTO Capital Contract 2017-5003; Calamity Creek Culvert Replacement, New Liskard, Ontario
- Burnhamthorpe Water project, Peel Region, Ontario
- Ottawa Combined Sewage Storage Tunnel (CSST)
- Eglinton Crosstown (Stations)



Coxwell By-pass Tunnel, Toronto, Ontario



- **Contractor:** JayDee / Michels / C&M McNally (North Tunnel Constructors)
- **Owner:** City of Toronto
- **Engineer:** Black & Veatch / RV Anderson
- **Location:** Downtown Toronto
- **Project Status:**
 - 10.6km long tunnel
 - 6.3m internal diameter
 - Entirely in Georgian Bay Formation at a depth of approximately 55m.
 - Shielded TBM (Lovsuns)
 - 5 Tunnel shafts/chambers, 11 drop shafts/adits and 2 diversion chambers.

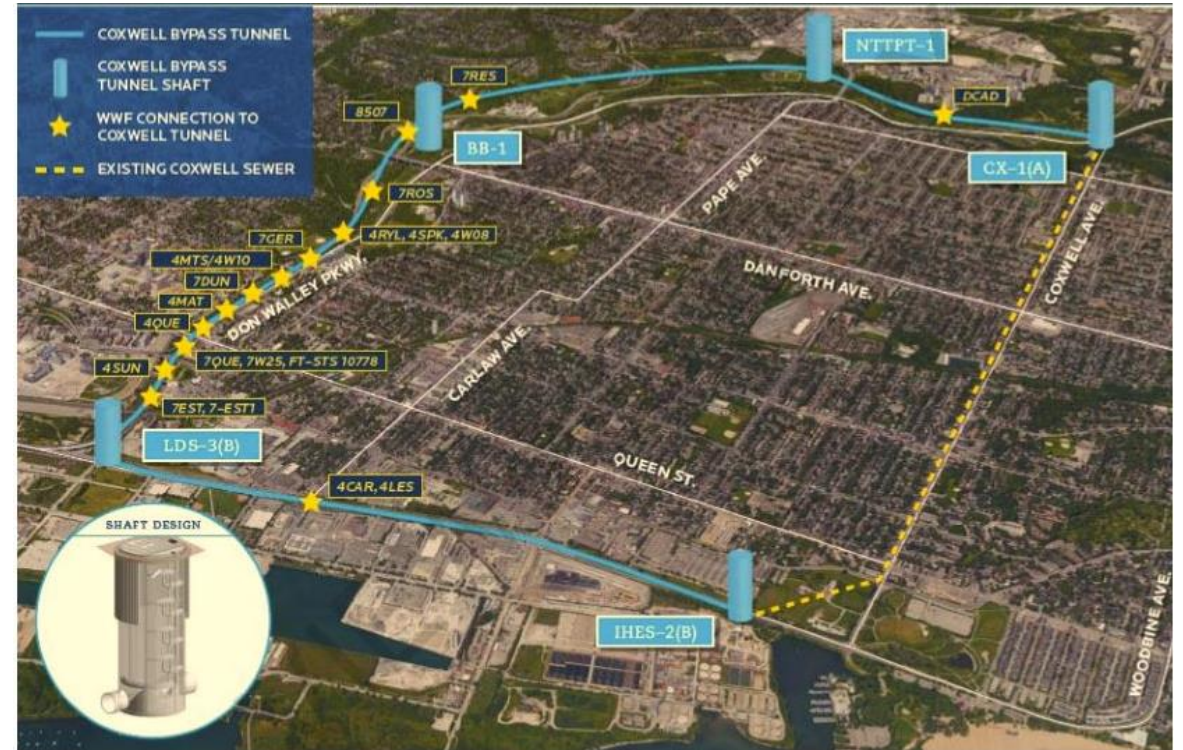
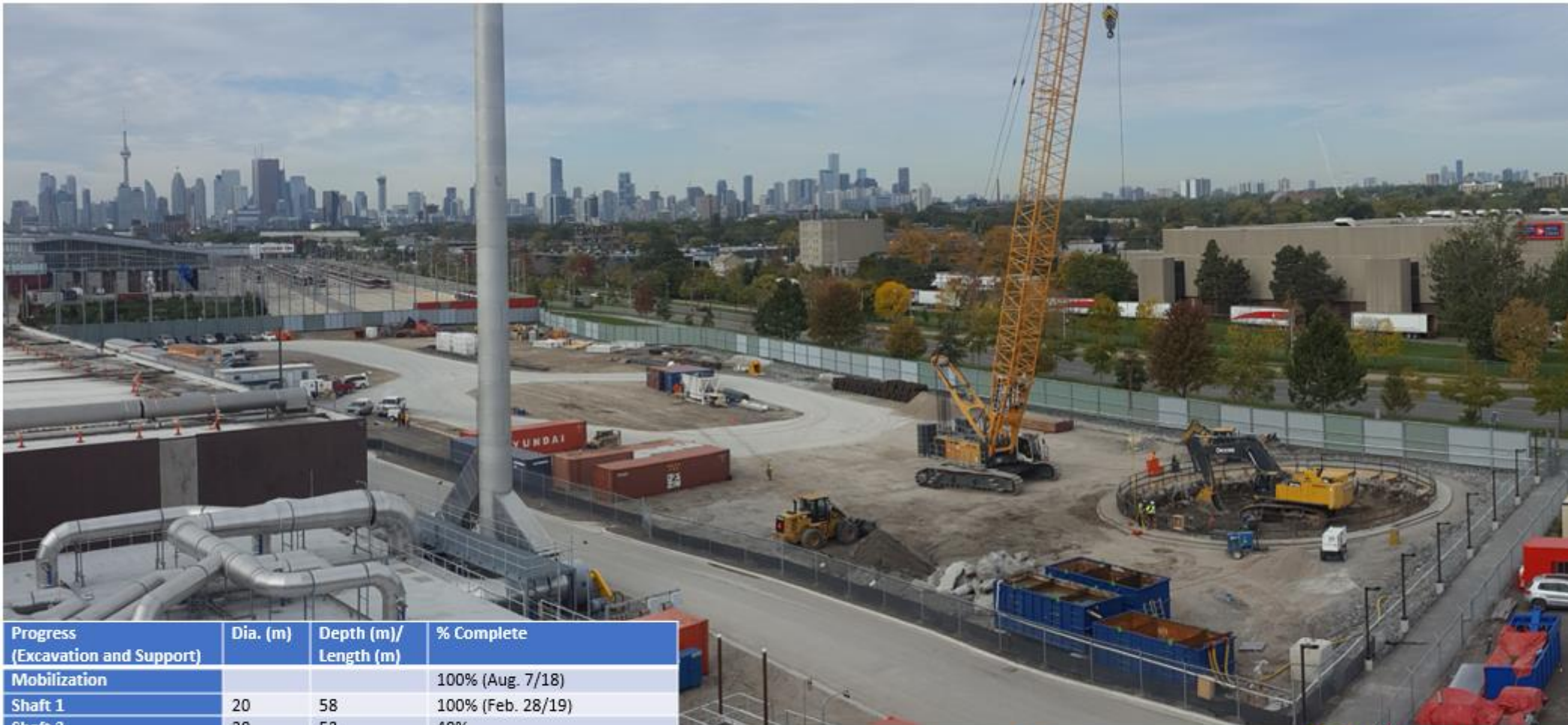


Figure 1 Coxwell Bypass Tunnel Alignment

Photo Source: City of Toronto



Coxwell By-pass Tunnel, Construction Progress



Progress (Excavation and Support)	Dia. (m)	Depth (m)/ Length (m)	% Complete
Mobilization			100% (Aug. 7/18)
Shaft 1	20	58	100% (Feb. 28/19)
Shaft 2	20	53	40%
Shaft 3	20	54	30%
Shaft 4	20	54	5%
Shaft 5	22	55	0%
Starter/Tail Tunnel	8	188	5%
TBM Tunnel	6.3	10,260	0%



Ashbridges Bay Treatment Plan Outfall (ABPTO) Tunnel

- **Owner:** City of Toronto
- **Location:** Downtown Toronto
- **Engineer:** Hatch / Jacobs
- **Contractor:** Southland Astladi JV
- **Project Status:**
 - 3.5km tunnel of 7m diameter (PCTL);
 - entirely in soft rock/shale of the Georgian Bay Formation.
 - Single Shielded TBM (Robbins)
 - 85m deep shaft (14m ID)
 - 50 risers in the lake (1m ID).
 - Project Awarded December 2019
 - Anticipated Completion: 2024



Photo Source: Hatch

Ashbridges Bay Treatment Plan Outfall (ABPTO) Tunnel



Photo Source: City of Toronto



Hwy 401/409 Rail Tunnel Project

- **Owner:** Metrolinx/Infrastructure Ontario
- **Location:** Toronto, ON
- **Engineer:** Dr. Sauer, WSP, Amec
- **Contractor:** Toronto Tunnel Partners Construction JV (STRABAG Inc./EllisDon Civil Ltd.)
- **Project Status:**
 - New Tunnel beneath Hwy 401/409 (21 lanes of traffic)
 - SEM construction proposed
 - Instrument installation completed
 - Substantial Completion: 2021



The existing rail tunnel beneath Hwy # 401 in the Toronto area (Source Infrastructure Ontario)



Hwy 401/409 Rail Tunnel Project



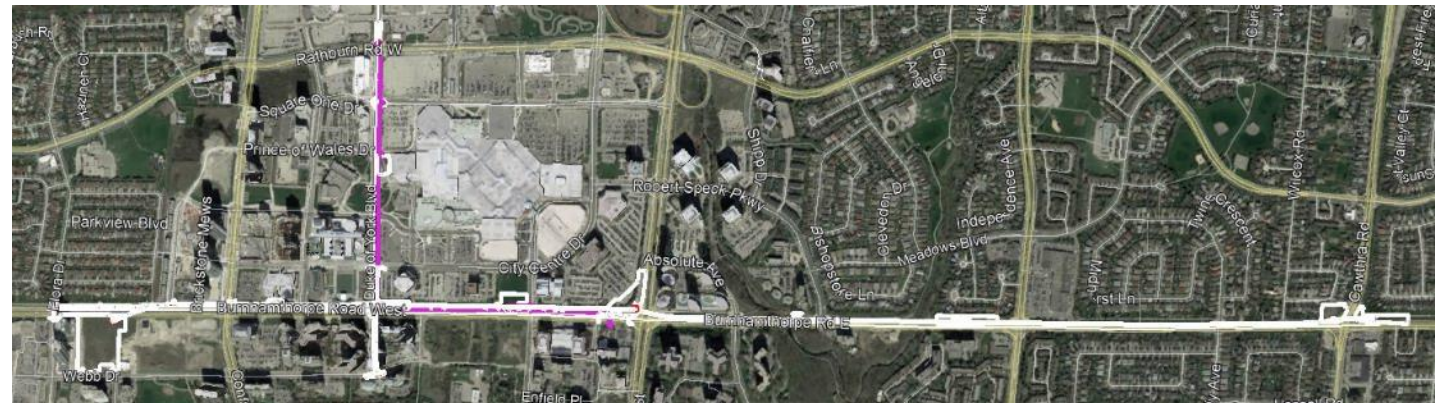
MTO Capital Contract 2017-5003; Calamity Creek Culvert Replacement, New Liskard, Ontario

- The Calamity Creek Culvert replacement project consists of two parallel tunnel crossings of Hwy # 11 near New Liskard Ontario.
- The two tunnels are approximately 160m long each, 2.5m internal diameter and will be constructed using an Earth Pressure Balance TBM.
- Along with the two tunnels, there are the launch and retrieval shafts, access roads, open cut, and settlement monitoring works to be performed.
- The design build project bid on January 31, 2018 and CDB (Construction Demathieu & Bard Inc.) were low bidders and were awarded the project. The tunnelling will be performed by CRS Tunnelling Inc.



Burnhamthorpe Water Project, Peel Region, Ontario

- **Owner:** Region of Peel
- **Location:** Mississauga
- **Engineer:** Hatch
- **Contractor:** Technicore Underground Inc.
- **Project Overview:**
 - Conventional tunnelling and microtunnelling
 - 3.8km of 3000mm diameter tunnel along Burnhamthorpe Road (between Grand Park Drive and Cawthra Rd) will house a 1500mm diameter watermain
 - 200m 600mm watermain (microtunnel) along Duke of York Blvd between Webb Drive and Burnhamthorpe Road
 - 1.4km 1200mm Sanitary Sewer (microtunnel) along Duke of York and along Burnhamthorpe Road



Burnhamthorpe Water Project, Peel Region, Ontario

- **Project Status:**
 - 1500 Watermain Tunnel
 - Shafts constructed
 - 20m tail tunnel mined with TBM
 - 31m watermain tunnel mined with TBM (in progress)
 - 600 Watermain Microtunnel:
 - Shafts constructed
 - 15m mined with SPB MTBM (in progress)
 - 1200 Sanitary Microtunnel
 - Shafts in construction



Ottawa Combined Sewage Storage Tunnel (CSST)

- **Owner:** City of Ottawa
- **Location:** Downtown Ottawa
- **Engineer:** Stantec / CH2M Hill
- **Contractor:** Dragados / Tomlinson JV
- **Project Status:**
 - Total Tunnel length: 4088m + 2199m
 - Herrenknecht Double Shield Rock TBM installing 3m ID segments
 - 6 major drop shafts 2-3m dia
 - 6m Geology is shale
 - Tunnelling is underway
 - Completion estimated: 2020



Photo Source: City of Ottawa

Eglinton Crosstown (Stations)

- **Owner:** Metrolinx
- **Location:** Toronto, ON
- **Contractor:** Crosslinx Transit Solutions (Dragados/Aecon/EllisDon/SNC Lavalin)
- **Project Overview:**
 - 15 Stations (3 mined)
 - Completion 2021
 - SEM Construction
 - Main Entrance: Cross Cut – left, right, centre drifts + bench + invert
 - Secondary Entrance: Access Adit – left, right drifts + bench + invert
 - Station + crossover/storage track: Full/Reduced Cavern – left, right, centre drifts + bench + invert

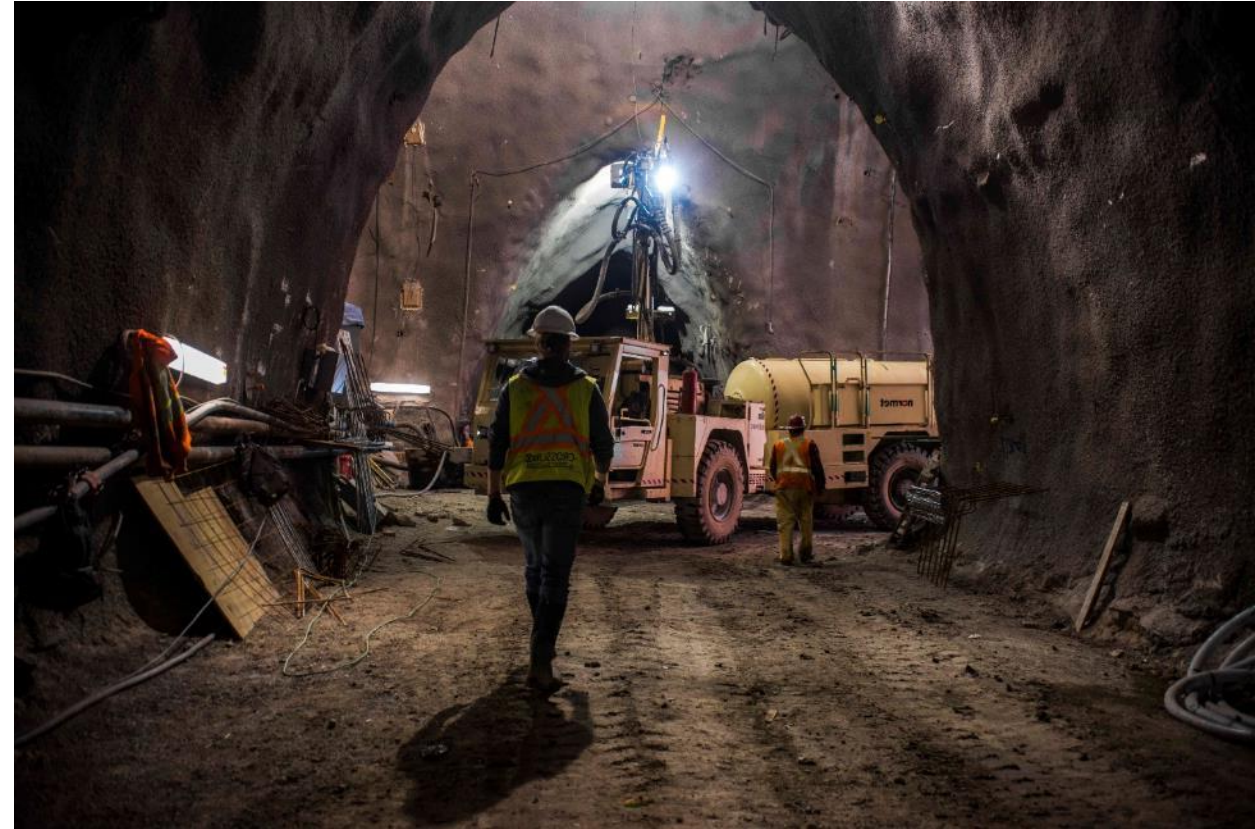


Photo Source: Metrolinx

Eglinton Crosstown (Stations)

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Eglinton Crosstown (Stations)

Photo Source: Metrolinx



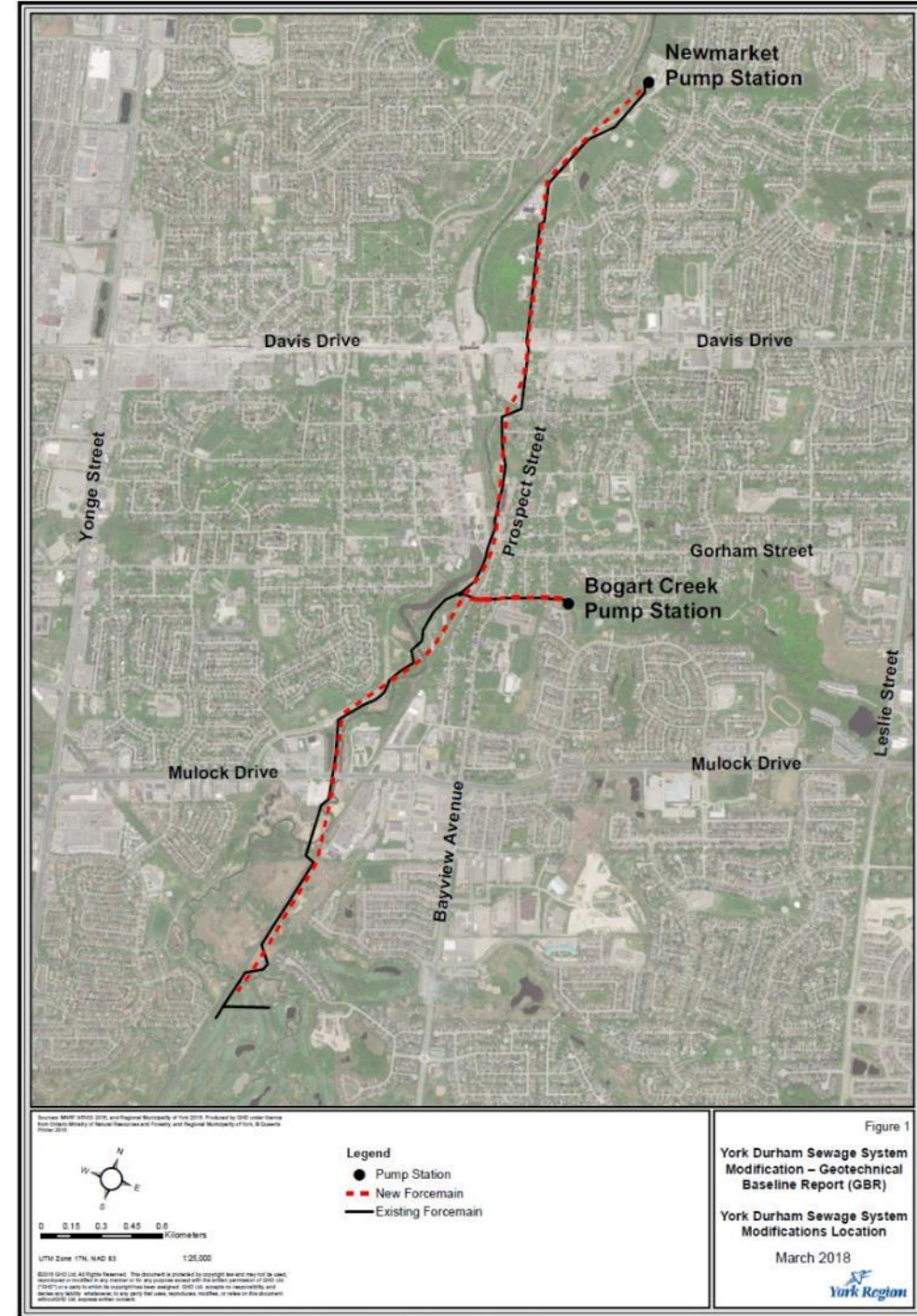
PROJECTS IN DESIGN PHASE

- YDSS Forcemain Twinning
- Snelgrove Watermains
- Halton South Georgetown Waste Water Servicing
- West Trunk Sewer Diversion
- West Brampton WM
- Fairbank-Silverthorn Storm Trunk Sewer System
- Integrated Pumping Station
- East to West Diversion Sanitary Trunk Sewer
- The West Vaughan Sewage System Project – York Region
- Dickinson Road Sanitary Trunk Sewer – Hamilton
- Scarborough Subway Extension
- Relief Line South
- Yonge Subway Extension



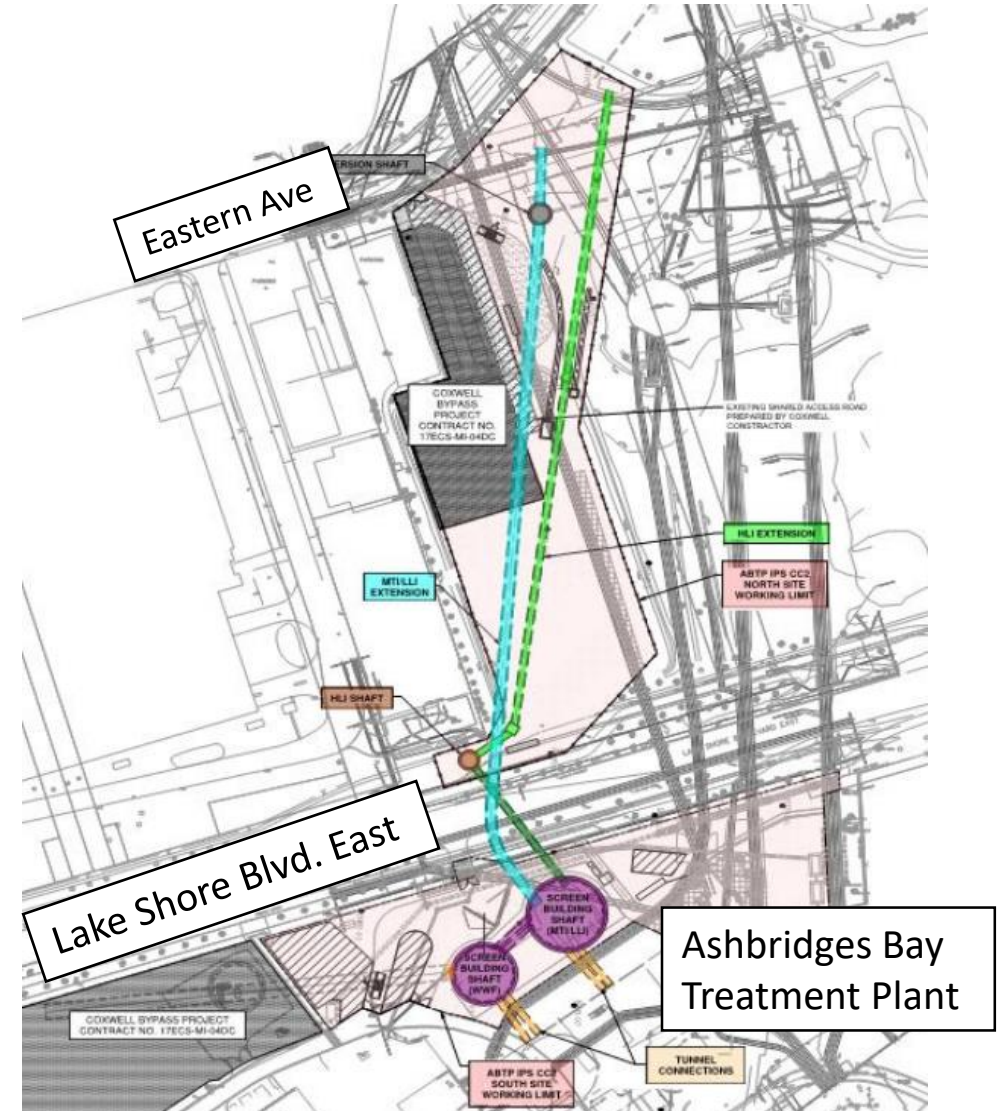
YDSS Forcemain Twinning

- **Owner:** York Region
- **Location:** Newmarket, ON
- **Engineer:** GHD
- **Project Overview:**
 - 5.5 km of 450 & 1050mm diameter forcemain
 - Sand, silt, till, with boulders below the water table
 - Approx. 5000 m of 2.5m i.d. microtunnels (8 drives).
 - Tunnel Drives ranging in length from 310 to 815 m
 - Several drives have curved alignment (minimum radius = 500m)
 - 60 m of 1.2m i.d. microtunnel (1 tunnel drive)
 - Total of 10 shafts – depths range from 12 to 18 m
 - 3 separate crossings of Metrolinx rail tracks
 - Several crossings of East Holland River
 - Second pass for installation of concrete forcemain
 - Tender closing on March 8, 2019 (tomorrow)



Integrated Pumping Station (Construction Contract 2)

- **Owner:** City of Toronto
- **Engineer:** Black & Veatch
- **Location:** Ashbridges Bay Wastewater Treatment Plant, Toronto
- **Project Description:**
 - 310 m long, 3.4 m internal diameter tunnel in Georgian Bay shale at a depth of approximately 25 m to be constructed by roadheader machine
 - 65 m slurry microtunnel crossing of Lake Shore Blvd. East (2.4 m diameter, 8 m deep)
 - Two Screen Building shafts (24 m diameter, 65 m deep and 30 m diameter, 25 m deep)
 - 8 m diameter Diversion Shaft, 25 m deep
 - 7 m diameter microtunnel reception shaft, 9 m deep
- **Project Status:**
 - Anticipated tender release: March 2019
 - Estimated construction start: Q3 2019



Source: Black & Veatch



Snelgrove Watermains

- **Owner:** Peel Region
- **Location:** Brampton, ON
- **Engineer:** GHD
- **Project Overview:**
 - Approx 3.6km of 1050mm 300mm & 600mm diameter watermain on Highway 10 (Hurontario) and Mayfield Road – tunnelling & open cut
 - Geotechnical investigation ongoing – anticipated to be mainly competent till for tunnel

Photo Source: GHD



- Tunnelling or microtunnelling or both (TBD)
- 2 tunnel drives
- 700m on west side of Highway 10
- 45m perpendicular crossing of Highway 10
- Crossings of East Holland River, and Highway 10
- Second pass for installation of watermain pipe
- Expecting to tender June/July 2019



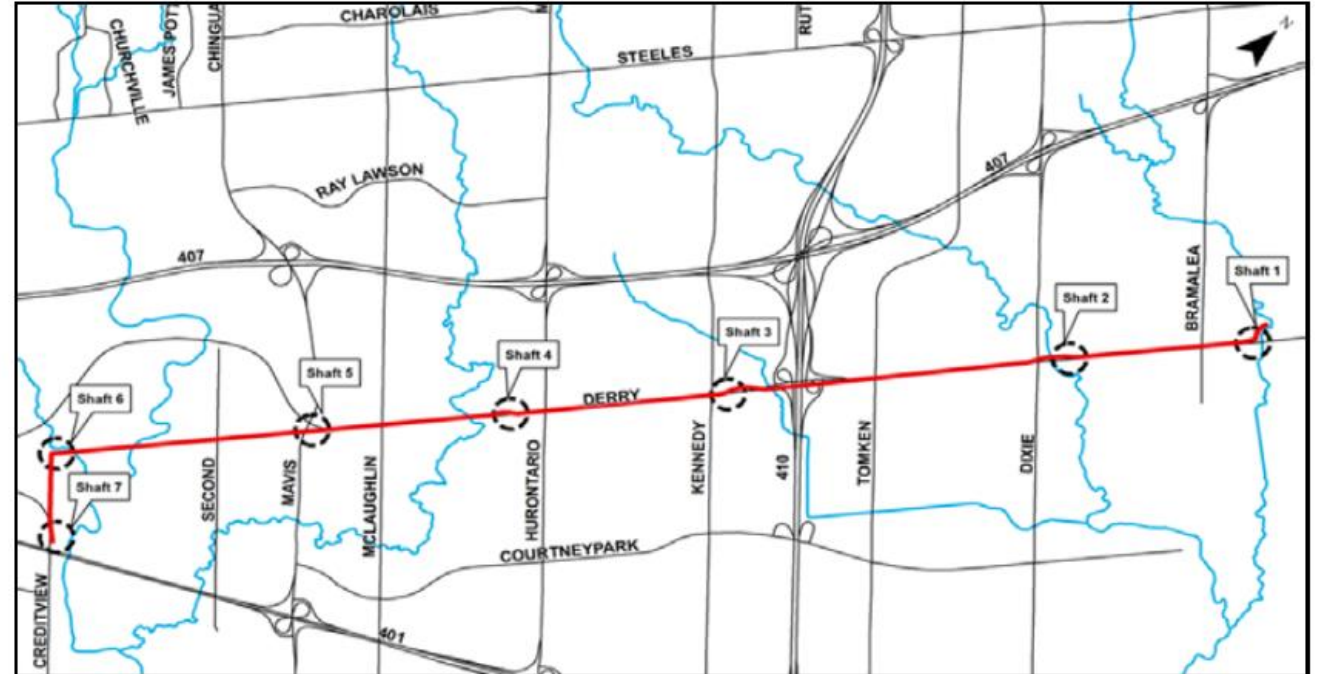
Halton South Georgetown Wastewater Servicing

- **Owner:** Halton Region
- **Location:** Milton/Halton Hills
- **Engineer:** Hatch
- **Construction:** 2020 to 2022
- **Project Overview:**
 - 15 km long 1200mm diameter sanitary trunk sewer
 - Depth ranging from 10 to 26 m
 - To be constructed trenchless (Microtunnel or TBM)
 - Multiple Crossings
 - Water courses
 - Union Gas Pipeline
 - CP Rail
 - Hwy 401



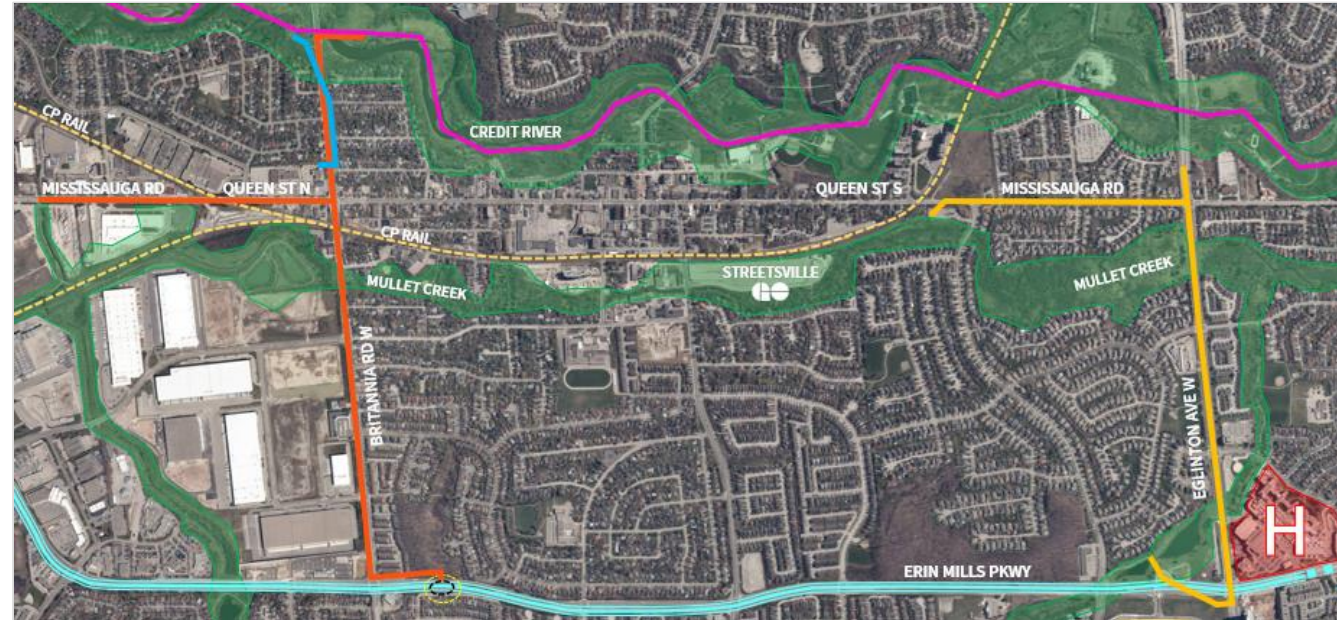
East to West Diversion Sanitary Trunk Sewer

- **Owner:** Peel Region
- **Location:** Mississauga
- **Engineer:** Jacobs
- **Tender:** Q2/Q3 2019
- **Construction Completion:** 2021
- **Project Overview:**
 - New 11 km, 2.4 mm diameter trunk sewer
 - Connections to the existing east trunk sewer and the west trunk sewers
 - Decommissioning of the existing Meadowvale Sewer Pumping Station
 - Mixed ground conditions but tunnel is primary in the Georgian Bay Shale
 - Multiple Contracts



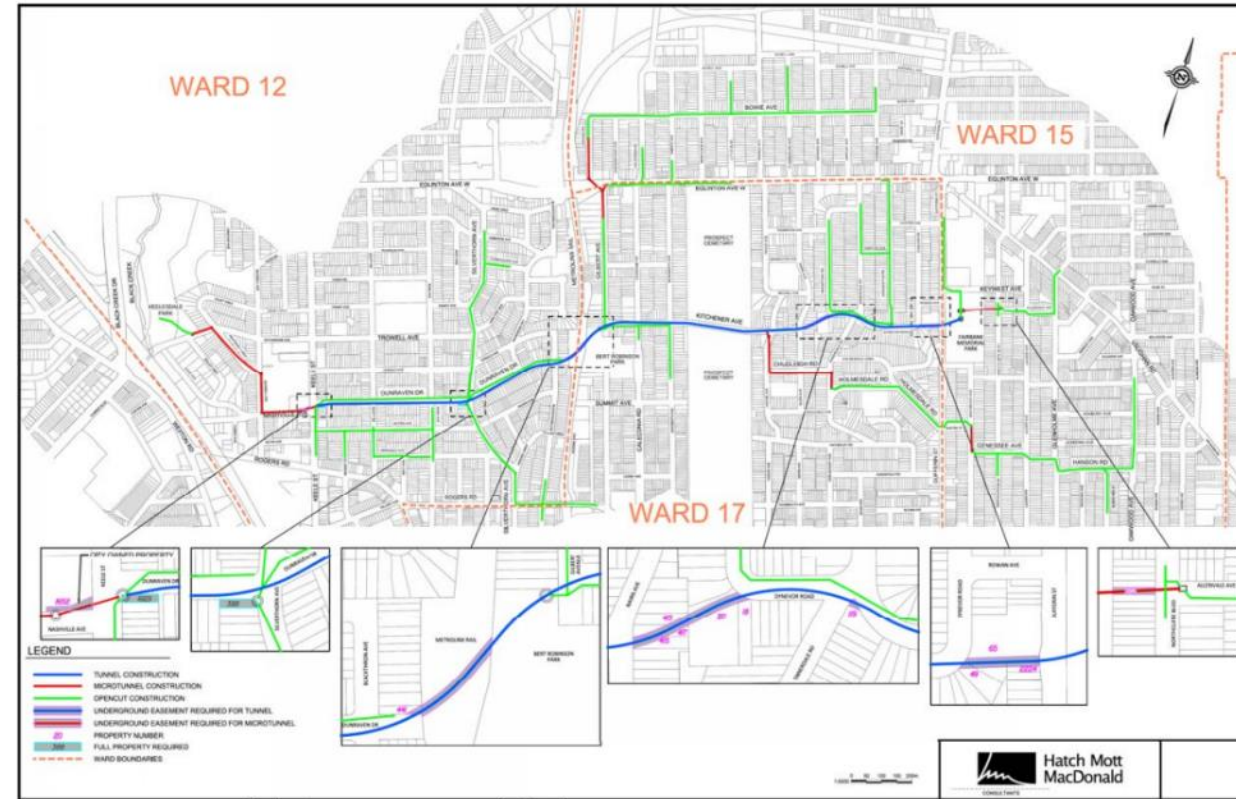
West Trunk Sewer Diversion

- **Owner:** Peel Region
- **Location:** Mississauga
- **Engineer:** Hatch
- **Construction:** 2021-2023
- **Project Overview:**
 - Diversion of flows from the existing Credit Valley Trunk Sewer to the West Trunk Sewer via three (3) diversion areas and 2 major Trunk Sanitary Sewers
 - ~5.5km of 15 – 45m Deep Trunk Sanitary Sewer (900/1200/1500mmØ) complete with automated diversion structures
 - CCDC Style Contract

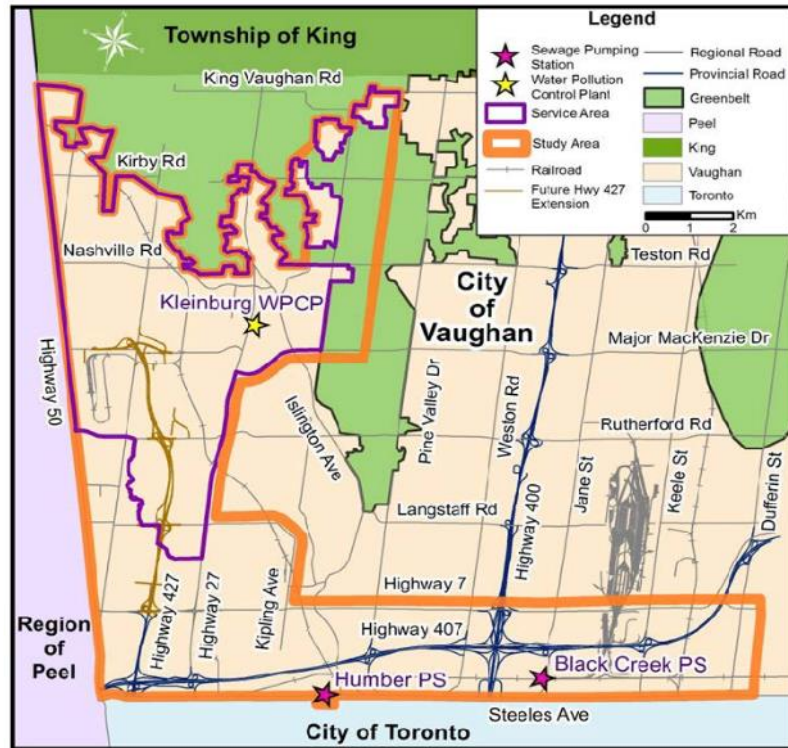


Fairbank-Silverthorn Storm Trunk Sewer System

- **Owner:** City of Toronto
- **Location:** Toronto
- **Engineer:** TBD
- **Construction:** 2021 to 2025
- **Project Overview:**
 - 2.2 km long 4.0m diameter inline storage tunnel and approx. 10.5 km of sub-trunk and local collector storm sewers
 - Sub-trunk and local collector sewers to be constructed via open-cut and trenchless methods (microtunnel)
 - Storm sewer outfall to Black Creek
 - Disconnect existing catchbasins from combined sewer and connect to new collector storm sewers
 - Design and implementation of catchbasin Inlet Control Devices



The West Vaughan Sewage System Project – York Region



West Vaughan Class EA Study and Service Area (CDR, 2014)



WVSS Project compared CDR and PDR alignments and compounds

The internal diameter will be 3m finished and the total length of tunnelling will be approximately 14km long.

(Source GeoData Engineering for YR)

Contract	Anticipated Construction Schedule
Humber Pumping Station package	2022 to 2025
Tunnel Phase 1 package	2024 to 2028
Tunnel Phase 2 package	beyond 2034



Dickinson Road Sanitary Trunk Sewer - Hamilton

Owner: City of Hamilton

Location: Hamilton, ON

Engineer: Cole

Construction: 2021 to 2025

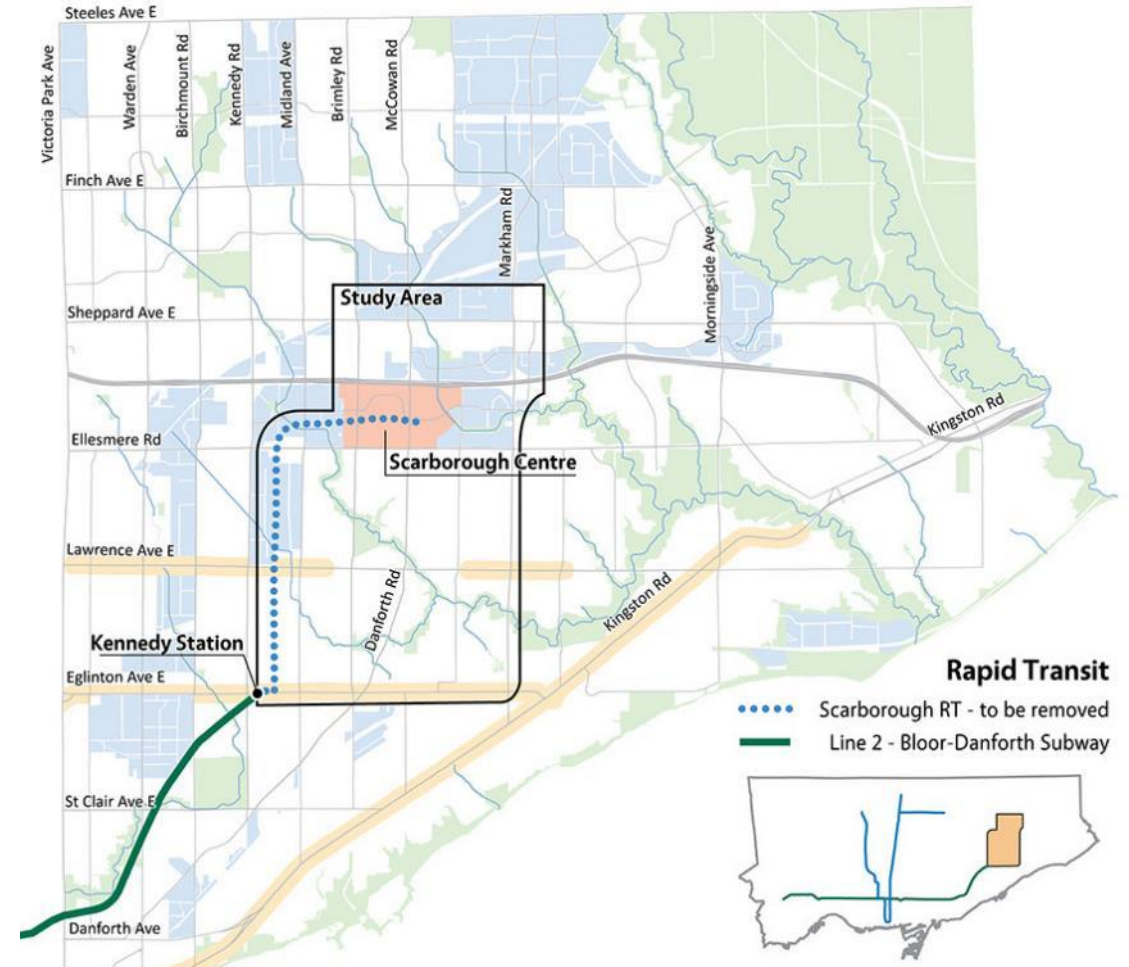
Project Overview:

- New 1200 mm dia x 3.7 km long gravity sewer along Dickenson Rd from Hwy #6 to about 900 m west of Nebo Rd, constructed by open-cut;
- Connecting to a new 1350 mm dia x 2.9 long gravity sewer along Dickenson Rd from the end of the above sewer to Trinity Church Rd and Golf Club Rd, constructed by tunneling;
- Connecting to a new 1350 mm dia x 3.4 km long gravity sewer along Golf Club Rd from the end of the above sewer to Regional Rd #56, also constructed by tunneling



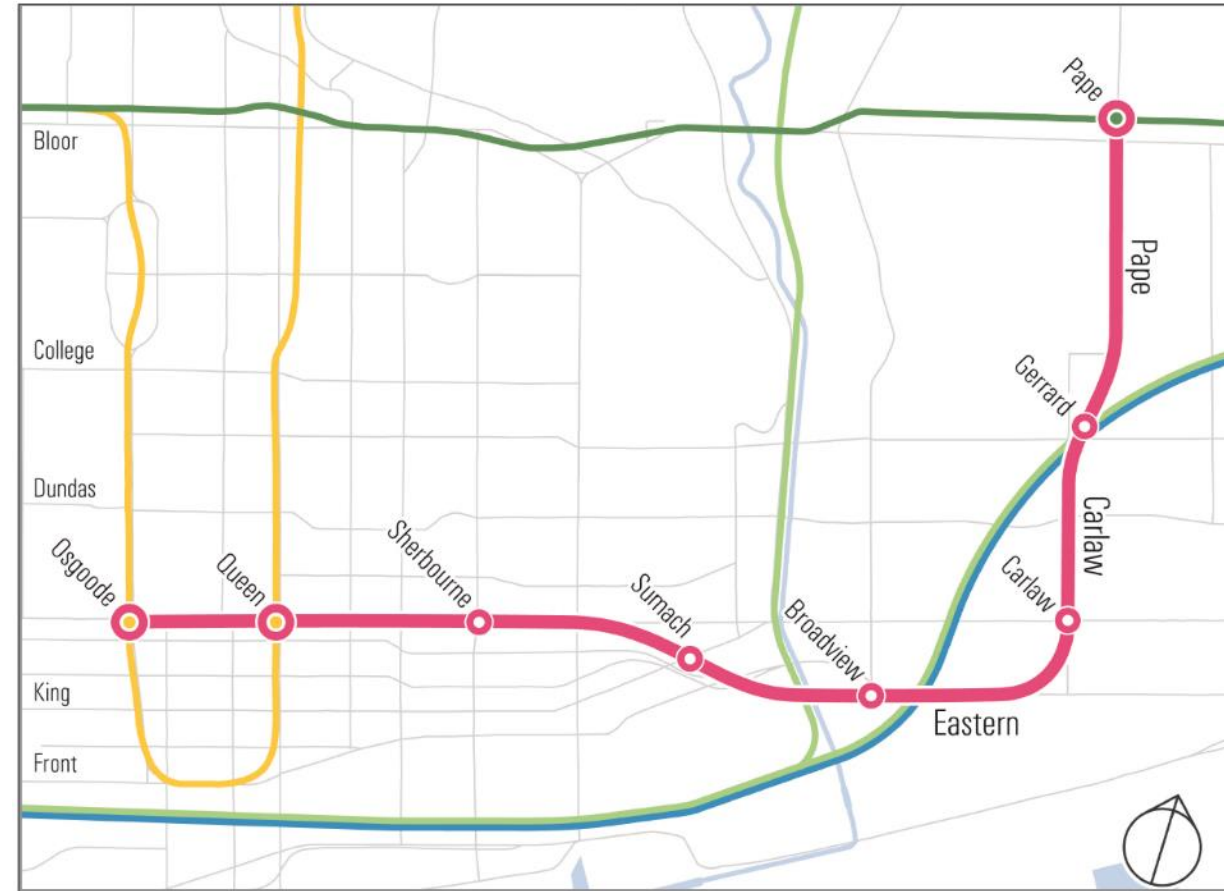
Scarborough Subway Extension (SSE)

- **Owner:** TTC
- **Location:** Toronto, ON
- **Engineer:** Hatch
- **Project Highlights:**
 - The extension of Line 2 from Kennedy Station to Scarborough Centre via McCowan Rd.
 - The Scarborough Subway Extension will include a station west of McCowan Rd, North of Triton Rd and a large bus terminal adjacent to the station.
 - Status: 60% design completed



Relief Line South (RLS)

- **Owner:** TTC
- **Location:** Toronto, ON
- **Engineer:** ARUP
- **Project Highlights:**
 - New 7.5-kilometre-long rapid transit line.
 - Five (5) in-line stations
 - Three (3) interchange stations at:
 - Pape Station on the Line 2 Bloor-Danforth Subway
 - Line 1 Yonge-University-Spadina Subway at Queen
 - Line 1 Yonge-University-Spadina Subway Osgoode Stations.
- **Status:** 30% design ongoing



Yonge Subway Extension (YSE)

- **Owner:** TTC
- **Location:** Toronto, ON
- **Engineer:** Hatch
- **Project Highlights:**
 - From its current terminus at Finch Station, in the City of Toronto, to Richmond Hill Centre Station (RHCS), located in the Town of Richmond Hill
 - A total length of approximately 7.4 km
 - Six underground stations
 - Status: 15% design ongoing



Questions ?

