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Central Brampton

Environmental Study Report – Schedule ‘C’ MCEA for the Kennedy Road Sanitary Trunk Sewer

Peel Region

60736820

October 2026

AECOM

Peel Region

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Revision History

Revision #	Revision Date	Revised By	Details
0A	2026-02-20	Faranak Amirsalari	Draft ESR for Peel's Review
00	2026-09-30	Faranak Amirsalari	Revised Final Draft ESR
01	2026-10-21	Faranak Amirsalari	Revised Final Draft ESR

Distribution List

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✓	City of Brampton
✓	Town of Caledon
✓	Toronto and Region Conservation Authority (TRCA)
✓	Credit Valley Conservation (CVC)
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✓	MCM
✓	Ministry of Transportation (MTO)

Executive Summary

Project Purpose and Scope

The current sanitary trunk sewers in the City of Brampton (Brampton) have capacity constraints to meet projected future demands. Peel Region must increase sanitary sewer capacity by 2030 to support planned development in central Brampton and parts of the Town of Caledon (Caledon). To address this, Peel Region is planning to build a new large sanitary trunk sewer (STS), that will move wastewater, by gravity, to future and existing trunk sewer systems to increase conveyance capacity in central Brampton and southern Caledon.

This lack of capacity to meet projected demands is based on Bill 23, the "More Home Built Faster Act", requiring the Region of Peel to upgrade their water and wastewater infrastructure. Bill 23 impacts the Region's water and wastewater infrastructure by:

- Accelerating housing targets from the planned timeline of 2051 to 2031.
- The provincial target is to build more than 245,000 residential units in local municipalities; of which 113,000 in Brampton and 13,000 in Caledon apply.

To address the accelerated demand requirements, the Kennedy Road STS is proposed. This sewer is approximately 19 kilometres long sewer, 1,500 to 2,100 millimetres in diameter, running from Old School Road and Hurontario Street (Caledon) to the future Etobicoke Creek Trunk Sewer (ECTS) at Kennedy Road South (Brampton). A 1,200 millimetres Queen Street STS from Rutherford Road North to this proposed Kennedy Road STS is also included in the project scope.

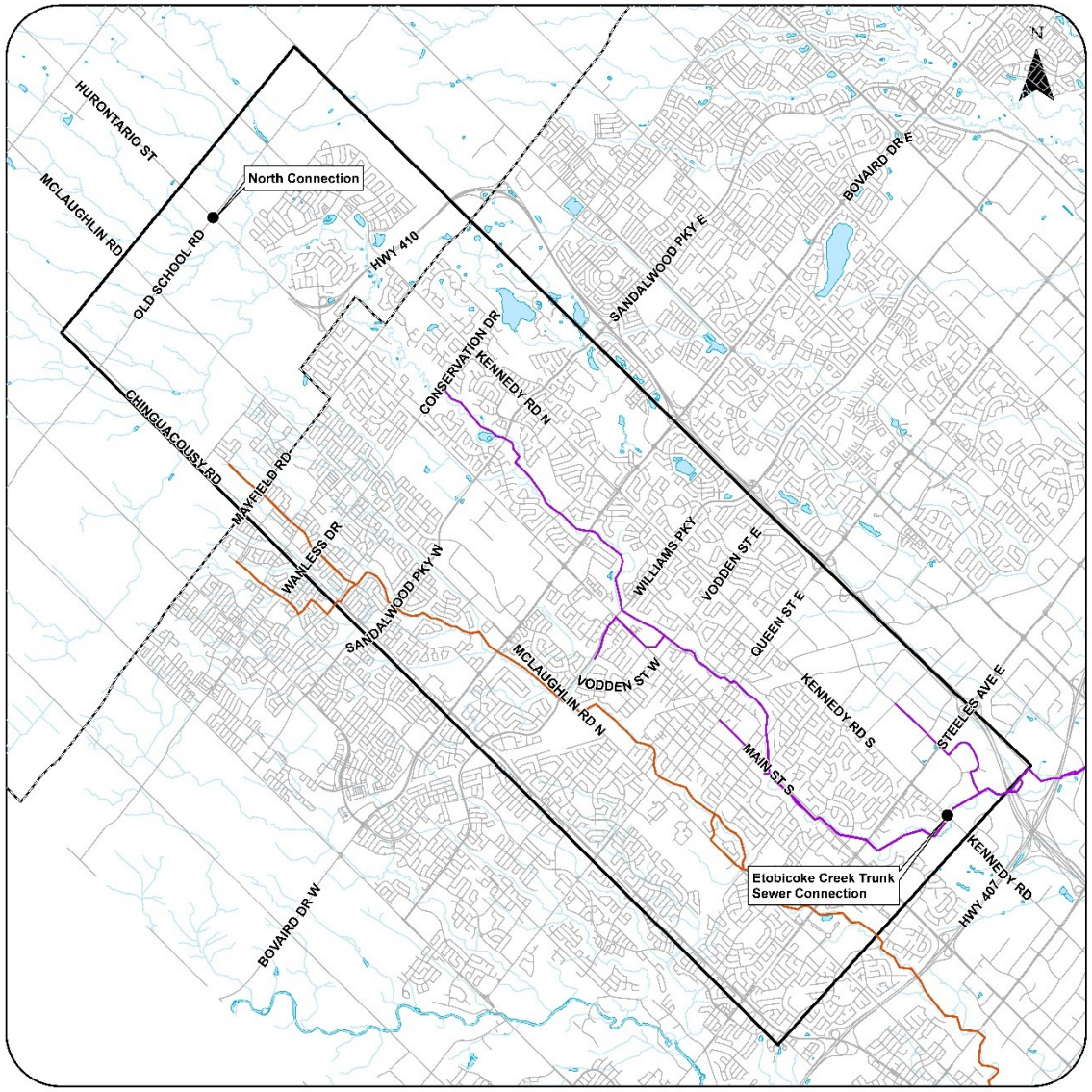
Coordinated Infrastructure Delivery

The Region is employing a Program management approach called the Flow Central Brampton Program (Program), bundling water and wastewater projects across the area to maximize efficiency, reduce conflicts, and accelerate timelines. The Kennedy Road STS is one of these coordinated projects. The Program addresses housing demands while enhancing existing assets, protecting the environment, maintaining excellent water and wastewater service while meeting community needs and fulfilling commitments to the province.

Study Area and Geographic Context

The Study Area's boundaries are from Old School Road to the north in Caledon, south of Steeles Avenue to the south in Brampton, Highway 410 to the east and Chinguacousy Road to the west, as shown in Figure ES-1. This area encompasses rapidly developing communities within Brampton and Caledon.

Figure ES-1: Kennedy Road Sanitary Trunk Sewer EA Study Area



Existing Trunks
- Etobicoke Creek
- Fletchers Creek

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General Legend
- Sanitary Trunk Sewer Connection
- Municipal Boundary
- Kennedy Rd Study Area
- Roads
- Watercourse
- Waterbody

Data Sources:
Government of Ontario, Region of Peel
PN: 60736820
January 28, 2026



MCEA Process

This project is being planned under the Municipal Class EA Schedule C (Phases 1 to 4) framework, which requires a multi-phase evaluation of needs, alternative solutions, alternative designs, and consultation as presented below in Figure ES-2.

Figure ES-2: Phases of the Municipal Class EA (MCEA) Planning Process



Phase 1 – Problem and Opportunity Statement

The following problem and opportunity statement has been developed for this MCEA study:

> To support growth through 2051, Peel Region must increase the capacity of key sanitary trunk sewers serving Central Brampton and the Town of Caledon. Currently, wastewater conveyance capacity in these areas is insufficient to meet future demands, requiring upgrades by 2030 to align with Provincial housing targets. The Kennedy Road STS Schedule C MCEA study will help address this need by facilitating stakeholder consultations – including review agencies, Indigenous communities, and the public – to guide the selection of an optimal solution and associated design concept. Additionally, the study enables coordination with other infrastructure projects, improving efficiencies and informing Peel Region's 2026 Water and Wastewater Master Plan Update.

Phase 2 – Route Evaluation and Selection

Following completion of Phase 1, Phase 2 (alternative solutions) included developing a routing evaluation methodology that looked at the long list of routing alternatives to arrive at a short-list for north (N1 and N2) and south (S1 and S2) routes as shown in Figure ES-3.

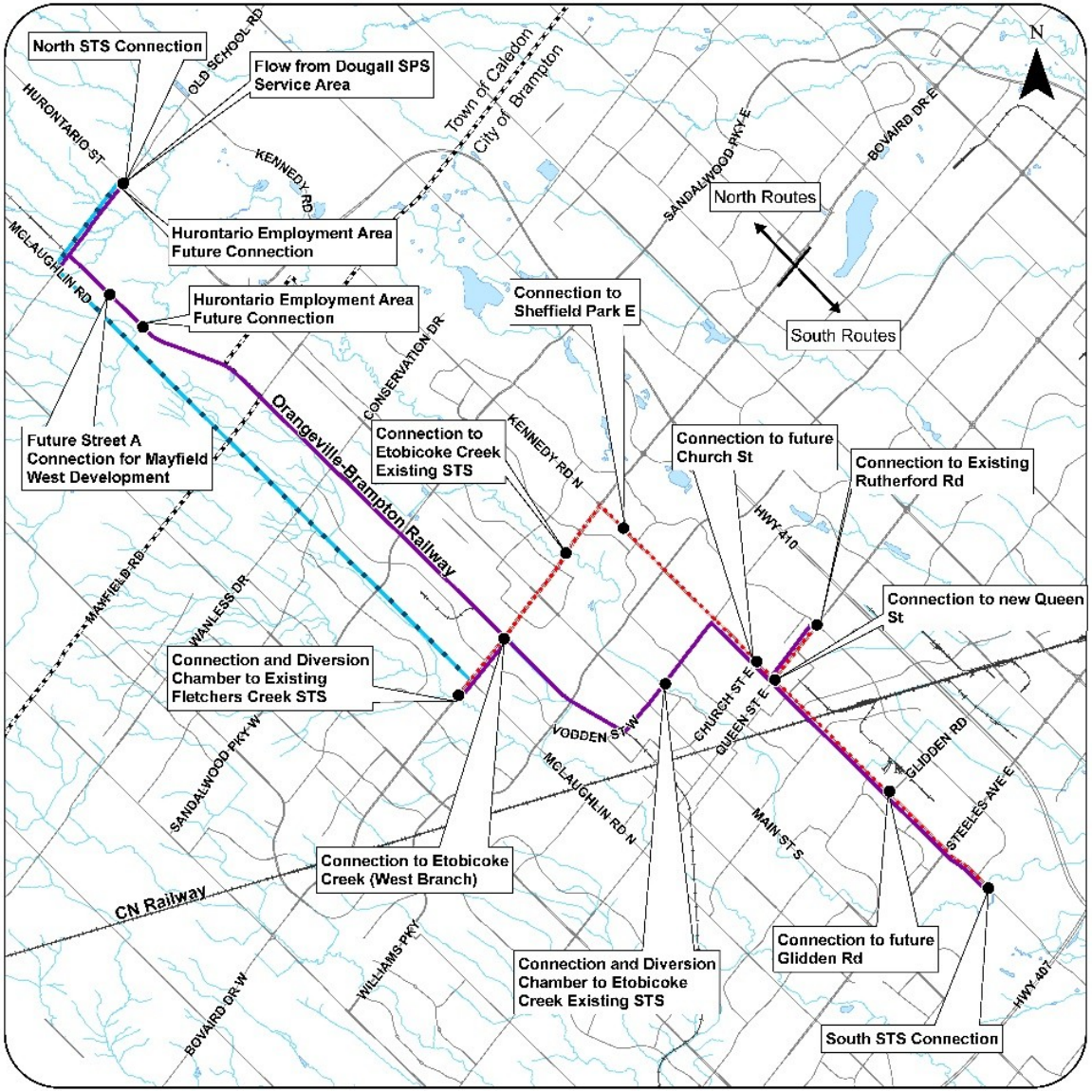
Short-listed routes were then evaluated using information from technical studies and infrastructure analysis to identify an overall recommended preferred STS route as shown below in Figure ES-4.

Phase 3 – Design Concepts

In Phase 3, the recommended preferred route was further evaluated looking at design alternatives which focused on construction methodology and shaft compounds evaluation and selection. To facilitate the evaluation of the construction methodology and identification and evaluation of shaft locations, the recommended preferred route was divided into 3 segments as shown below and in Figure ES-5:

- Segment 1: Kennedy Road from Etobicoke Creek to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road (approximately 5.8 kilometres). Although the Queen Street section was included in this EA, during the implementation phase, the segment along Queen Street will be implemented separately from the main project as Queen Street Sanitary Trunk Sewer.
- Segment 2: Vodden Street to Bovaird Drive, from Kennedy Road (approximately 3.8 kilometres) partly along Vodden Street and then along the Orangeville-Brampton Railway (OBR) corridor to Bovaird Drive; Bovaird Dr, OBR to Fletcher's Creek (approximately 900 metres) and also includes diversion chambers and connection at existing Etobicoke Creek and Fletcher's Creek Sanitary Trunk Sewers.
- Segment 3: OBR corridor Bovaird Drive to Old School Road and Old School Road from OBR to Hurontario Street (approximately 8.7 kilometres).
- Total alignment length: ~19 kilometres.

Figure ES-3: Short-Listed Routes



Shortlist Routes

- S1
- S2
- N1
- N2

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General Legend

- Sanitary Trunk Sewer (STS) Connections
- Municipal Boundary
- Railway
- Roads
- Waterbody
- Watercourse

Data Sources:
Government of Ontario, Region of Peel
PN: 60736820
Feb, 11, 2026



Figure ES-4: The Recommended Preferred Route

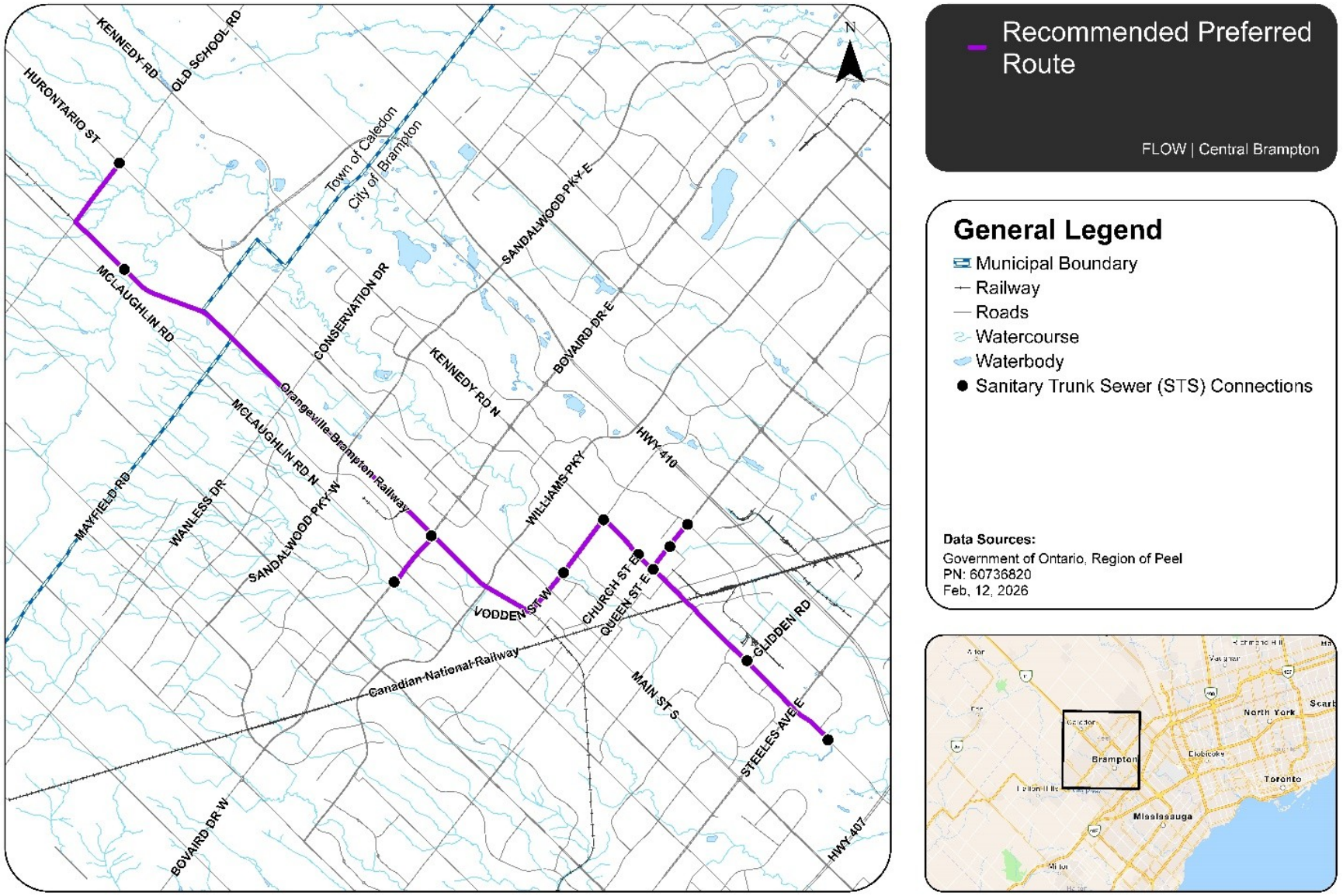
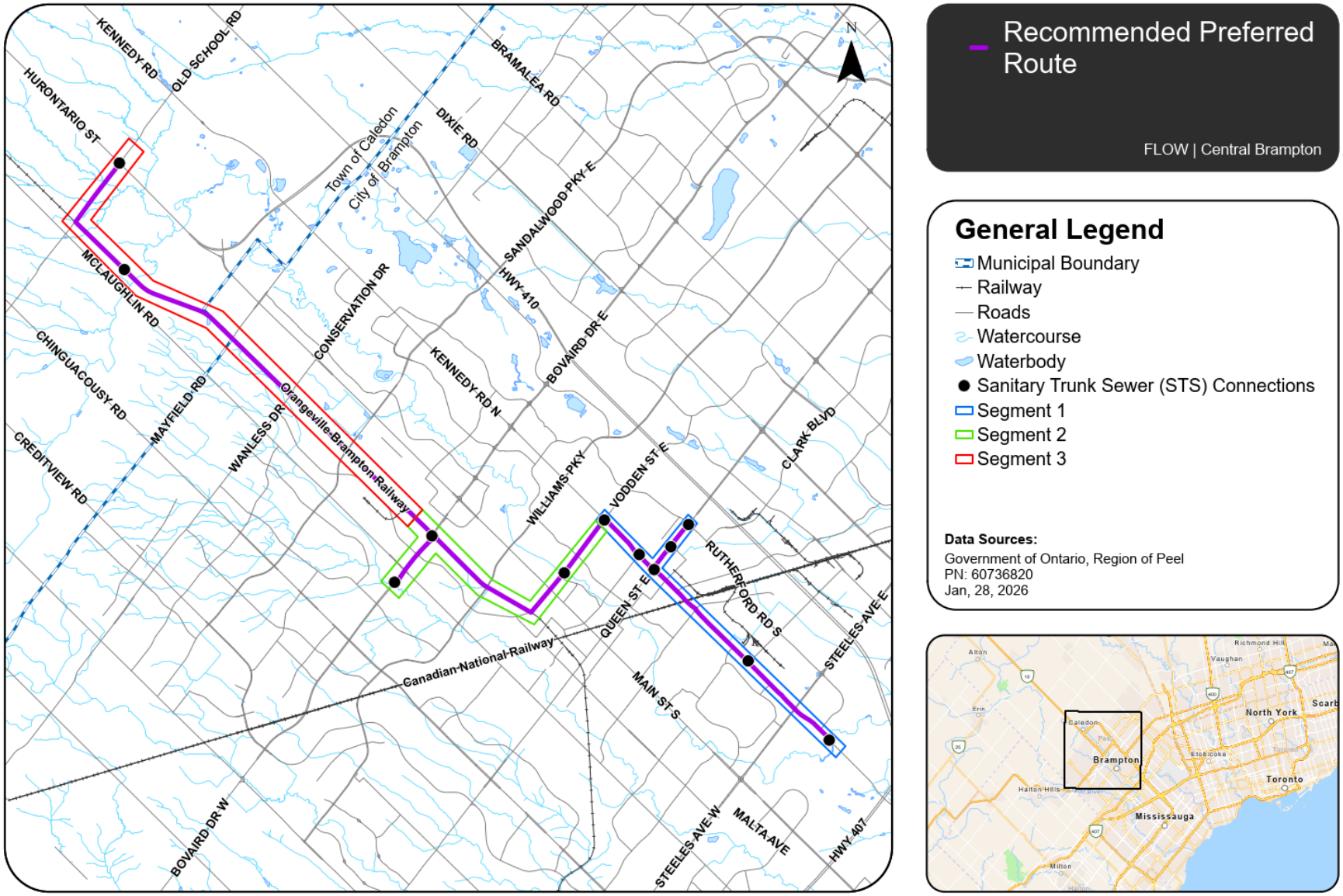
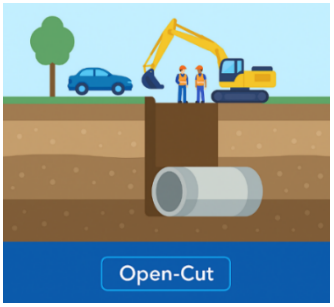


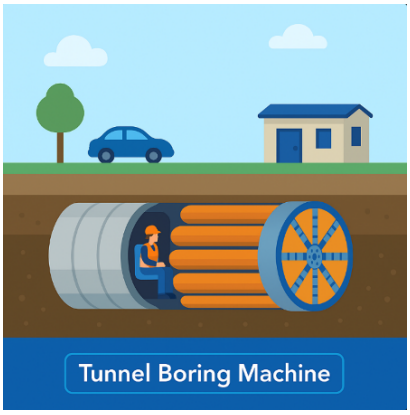
Figure ES-5: Phase 3 Preferred Route Segment Map



Construction Methodology

Given that the proposed sewer will need to be between 15 to 48 metre deep, construction by open-cut method (e.g., deep trenching) was ruled out based on significant impacts to the local community considering the built-up environment (e.g., potential conflicts with utilities and impacts to the travelling public, including lane and sidewalk closures) and available road right-of-way width.





Therefore, two trenchless construction methods were evaluated: 1) Tunnel boring machine (TBM); and 2) Micro-tunnel boring machine (MTBM). Both methods minimize disruptions on the surface to shaft compounds which are required to insert, remove and retrieve tunnelling machinery and manage construction of the tunnel itself. Tunnelling minimizes impacts to residents, traffic, and natural features compared to the open-cut method as described above. TBM method uses a large diameter tunnel boring machine that is controlled by an operator underground and can tunnel long distances between shafts thus, the shafts can be spaced further apart versus the MTBM method.

Conversely, MTBM is typically a smaller tunnel boring machine and tunnels shorter distances thus, less distance between shafts resulting in higher number of shafts compared to TBM method. They are operated from control containers located above ground.



Due to the relatively small diameters of the proposed sanitary sewer (1,500 millimetres and 1,800 millimetres) and the required maintenance hole spacing of approximately 1,000 metres, the TBM method is considered the least preferred option for Segments 2 and 3. This is primarily due to the significantly increased construction footprint, environmental impacts, cost, and schedule impacts, as summarized in Table ES-1.

The recommended preferred method of construction for each segment is as follows:

- **Segment 1:** either TBM or MTBM
- **Segment 2:** MTBM
- **Segment 3:** MTBM

The overall recommended construction methodology evaluation is summarized below in Table ES-1:

Table ES-1: Construction Methodology Evaluation Summary

Evaluation Category	Evaluation Criteria	Indicators	Segment 1:		Segment 2:		Segment 3:	
			TBM	MTBM	TBM	MTBM	TBM	MTBM
Technical	Tunnelling Considerations	Tunnel diameter	○	●	○	●	○	●
		Tunnel drive length and number of shafts	●	◐	●	◐	●	◐
		Shaft sizes and compound sizes	●	●	◐	●	●	◐
	Geotechnical & Hydrogeological	Versatility and different ground conditions	●	●	○	●	○	●
	Tunnelling considerations	Presence of gases	○	●	○	●	○	●
	Construction access	Ease of accessing shaft locations	●	●	●	●	●	◐
	Schedule	Project duration	●	●	◐	●	◐	●
Economic / Financial	Construction cost	Construction cost	◐	●	◐	●	◐	●
		Ease of maintenance; Ops and maintenance costs	◐	●	◐	●	◐	●
Natural Environment	Potential effects on fish and fish habitat	Disruption to fish and fish habitat (e.g., in-water works)	●	●	●	●	●	●
	Potential effects on terrestrial features	Loss of or disruption to natural heritage features	●	●	●	◐	○	◐
	Potential effects on SAR and SAR habitat	Loss of disturbance to SAR or their habitats	●	●	●	◐	○	◐
	Contaminated lands	Proximity to areas of potential environmental concern	●	◐	●	●	●	◐
	Groundwater impacts	Impacts to groundwater levels resulting from tunnelling in rock	◐	●	◐	●	◐	●

Evaluation Category	Evaluation Criteria	Indicators	Segment 1:		Segment 2:		Segment 3:	
			TBM	MTBM	TBM	MTBM	TBM	MTBM
Socio-Economic Environment	Number of potentially impacts sensitive receptors during construction	parks, high traffic commercial areas, residential areas	◐	○	●	◐	◐	●
	Traffic and active transportation impacts during construction	Expected number of open lanes during construction; impact on bike lanes and sidewalks; inconvenience	●	◐	●	◐	●	●
	Potential impacts on public transit during construction	Impact on potential lane closures	●	◐	●	◐	●	●
	Potential impact on agricultural operations	Impacts on Canada Land Inventory 1-3 Prime agricultural lands	●	●	●	●	◐	◐
Cultural Environment	Potential for loss or disturbance to potential archaeological resources	Areas requiring future archaeological assessment (e.g., Stage 2 AA)	◐	◐	◐	◐	◐	◐
	Impacts on built heritage and cultural heritage landscapes	Loss of or disruption to built heritage resources and cultural heritage landscapes	●	●	●	◐	●	◐
Legal / Jurisdictional	Property requirements	Number of permanent and temporary easements	◐	◐	◐	◐	●	◐
Climate Change	Climate change mitigation	Potential for generating green house gas emissions	◐	◐	◐	●	◐	●
	Climate change mitigation	Vulnerability of infrastructure projects/ infrastructure to climate change effects (e.g., flooding)	●	●	●	◐	◐	●
Overall Evaluation			●	●	◐	●	◐	●

Legend: ● = Preferred ◐ = Less Preferred ○ = Least Preferred

A detailed evaluation of the construction methodologies is included in **Appendix L1**.

Shaft Compounds Evaluation and Selection

Similar to Phase 2 route evaluation, alternative shaft compounds were subject to long-list screening followed by more in-depth evaluation of short list options.

It is important to note that, in Phase 3 construction methodology evaluation, following review of the interface with the future ECTS, the Project Team identified a new shaft compound at Kennedy Road and First Gulf Boulevard, just north of the previously identified connection shaft at the future ECTS. The introduction of this new shaft compound minimizes conservation authority permitting risks and approval timelines, in addition to avoiding long lane closures along Kennedy Road and Etobicoke Creek trail closures. It also shortens construction duration and minimizes utility relocations.

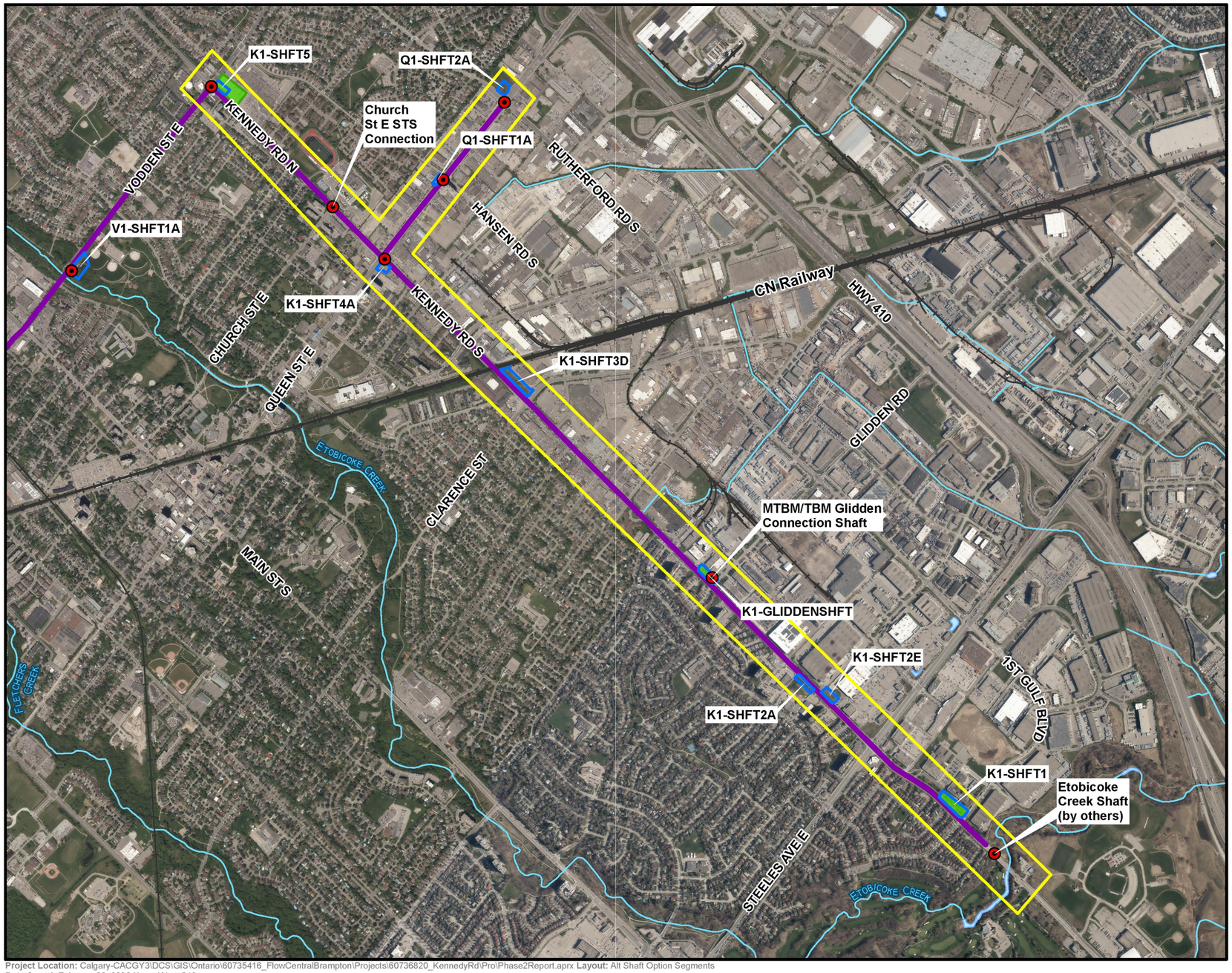
A total of 25 siting areas were screened with preferred site selected based on:

- Drive length optimization.
- Property and easement feasibility.
- Environmental and traffic impact minimization.

In addition to the above, 2 provisional shafts have been identified along the OBR to allow contractor flexibility to optimize constructability.

The preferred shaft compounds in Segments 1-3 are shown below in **Figure ES-6, Figure ES-7**, and **Figure ES-8,** respectively.

Figure ES-6: Segment 1: Kennedy Road from Etobicoke Creek to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road – Preferred Shaft Compound Locations





MTBM Shaft Compound Preferred
TBM Shaft Compound
Segment Boundary
Sanitary Trunk Sewer (STS) Connections
Preferred Route
Railway
Municipal Boundary
Waterbody
Watercourse

Flow | Central Brampton

Kennedy Road Sanitary Trunk Sewer

MTBM/TBM Shaft Alternative Compounds Segment 1

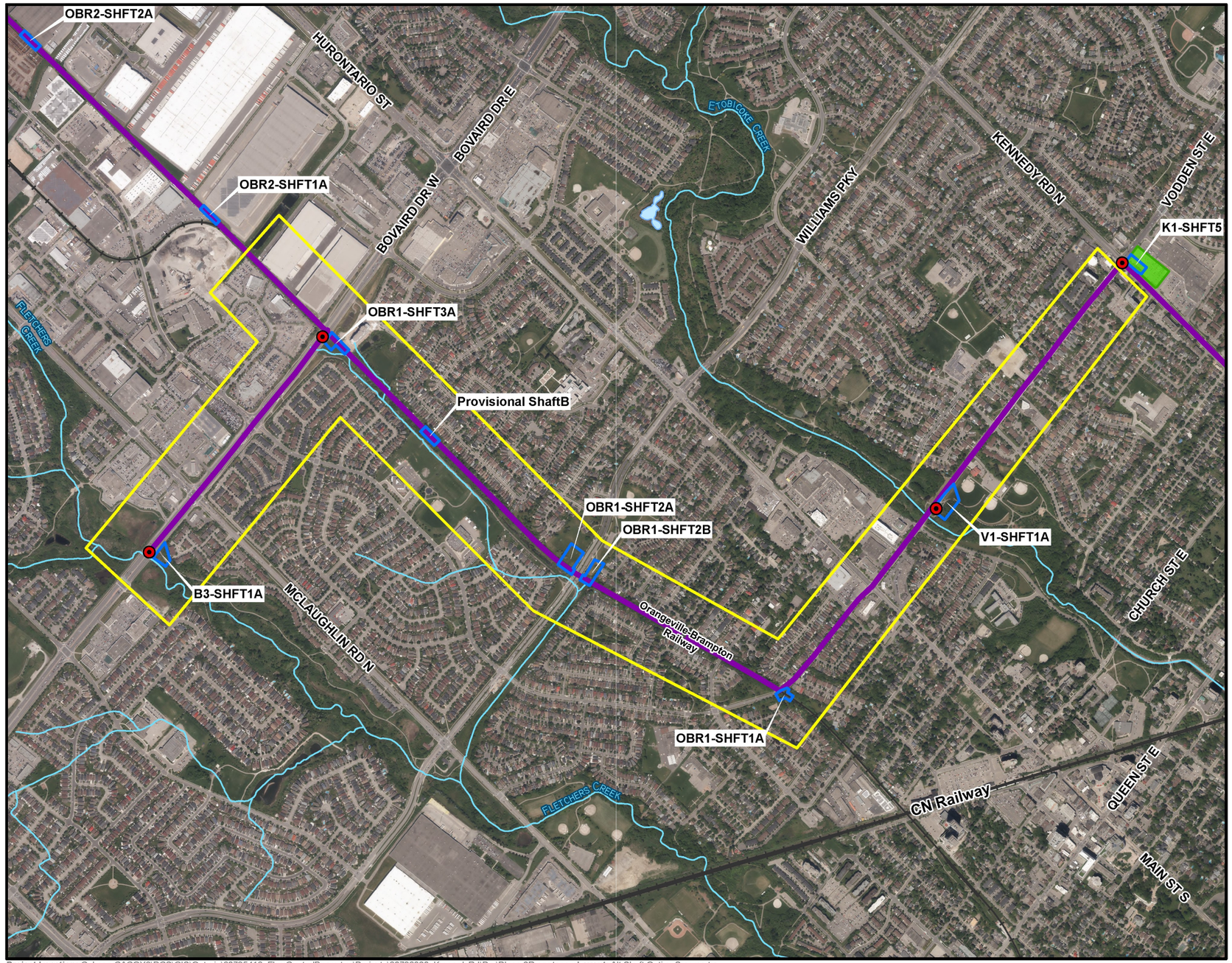
0 0.2 0.4 0.6 0.8
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PN: 60736820	Figure ES-6
February 12, 2026	AECOM

Data Sources:
Government of Ontario, Region of PEEL

Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Projects\60736820_KennedyRd\Pro\Phase2Report.aprx **Layout:** Alt Shaft Option Segments
Date Saved: February 06, 2026 **User:** WangS12

Figure ES-7: Segment 2: Vodden Street to Bovaird Drive from Kennedy Road; OBR – Bovaird Drive to Fletcher's Creek Preferred Shaft Compound Locations





- MTBM Shaft Compound Preferred
- TBM Shaft Compound
- Segment Boundary
- Sanitary Trunk Sewer (STS) Connections
- Preferred Route
- Railway
- Municipal Boundary
- Waterbody
- Watercourse

Flow | Central Brampton

Kennedy Road Sanitary Trunk Sewer

MTBM/TBM Shaft Alternative Compounds Segment 2

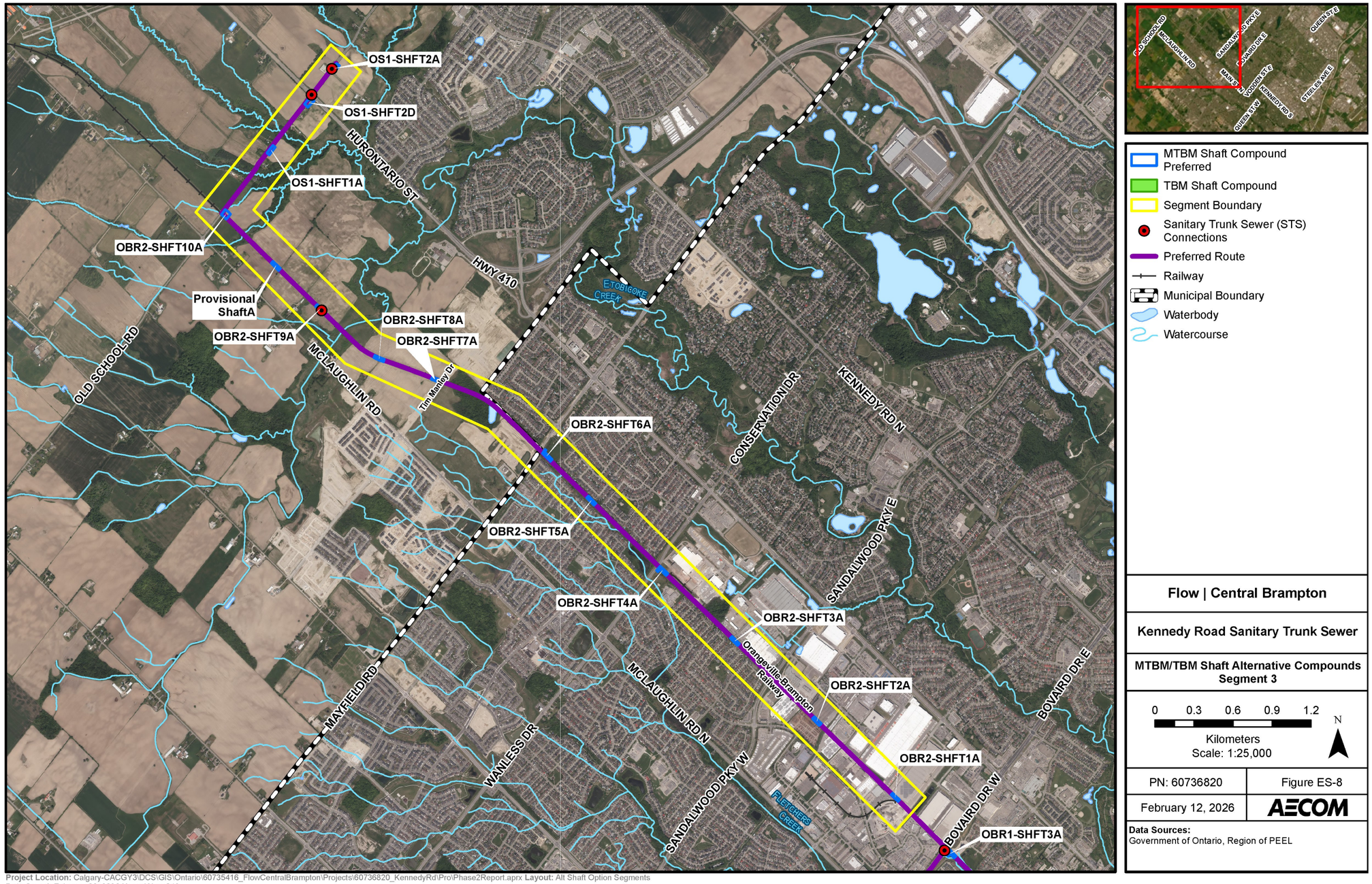
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PN: 60736820	Figure ES-7
February 12, 2026	AECOM

Data Sources:
Government of Ontario, Region of PEEL

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Figure ES-8: Segment 3: OBR Corridor to Old School Road and Old School Road from OBR to Hurontario Street Preferred Shaft Compound Locations



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A summary of the proposed shaft compounds, including staging areas ranging from 1,100 m² to 4,700 m², is given in Table ES-2. These shaft compounds consider the MTBM construction method for Segment 1 along Kennedy Road. If the TBM construction method is instead used along Kennedy Road, fewer shaft compounds are required, but these construction compounds would be larger in area. As noted above, both TBM or MTBM were equally preferred for Segment 1. The preference for MTBM versus TBM for Segment 1 will be confirmed during the detailed design phase.

Table ES-2: Summary of the Proposed Shaft Compounds Staging Areas

Shaft Designation	Shaft Location	Total Staging Area (m²)
K1-SHFT1	Kennedy Road South	2,227
K1-SHFT2	Kennedy Road South	1,842
K1-Glidden SHFT	Kennedy Road South/Glidden Road	1,802
K1-SHFT3	Kennedy Road South	1,099
K1-SHFT4	Kennedy Road South/Queen Street East	1,617
K1-SHFT5	Kennedy Road South/Vodden Street East	1,987
Q1-SHFT1	Queen Street East/Hansen Road North	1,135
Q1-SHFT2	Queen Street East/Rutherford Road South	1,960
V1-SHFT1	Vodden Street East (includes diversion chamber)	4,652
OBR1-SHFT1	Vodden Street West	1,450
OBR1-SHFT2	OBR/ Williams Pkwy	4,282
Provisional Shaft B	OBR	1,606
OBR1-SHFT3	OBR/ Bovaird Drive West	2,397
OBR2-SHFT1	OBR	1,793
OBR2-SHFT2	OBR	1,653
OBR2-SHFT3	OBR	1,587
OBR2-SHFT4	OBR/ Wanless Drive	1,997
OBR2-SHFT5	OBR	1,598
OBR2-SHFT6	OBR/ Mayfield Road	1,928
OBR2-SHFT7	OBR	1,766
OBR2-SHFT8	OBR	1,600
OBR2-SHFT9	OBR	1,600
Provisional Shaft A	OBR	1,587
OBR2-SHFT10	OBR/ Old School Road	2,697
OS1-SHFT1	Old School Road	1,656
OS1-SHFT2	Old School Road/Hurontario Street	2,526
Provisional Shaft B	OBR (between OBR2-SHFT9 and 10)	1,585
B3-SHFT1	Bovaird Drive West (includes diversion chamber)	2,261

This information will be reviewed at the detailed design stage to refine property acquisition requirements including easements.

An overview of the proposed sewer alignment technical parameters is given in Table ES-3.

Table ES-3: Summary of Sewer Alignment Technical Parameters

Segment	Street Name	Downstream Shaft	Upstream Shaft	Internal Diameter (mm)	Length (m)	Depth to Invert Level (m)
Segment 1	Kennedy Road	Etobicoke Sanitary Trunk Sewer Shaft	K1-SHFT1	2,100	219	26.9 – 31.9
	Kennedy Road	K1-SHFT1	K1-SHFT2	2,100	798	31.9 – 32.0
	Kennedy Road	K1-SHFT2	K1-GLIDDENSHAFT	2,100	736	32.0 – 34.7
	Kennedy Road	K1-GLIDDENSHAFT	K1-SHFT3	2,100	1,168	34.7 – 35.6
	Kennedy Road	K1-SHFT3	K1-SHFT4	2,100	869	35.6 – 41.1
	Queen Street	K1-SHFT4	Q1-SHFT1	1,500	457	12.4 – 16.5
	Queen Street	Q1-SHFT1	Q1-SHFT2	1,500	473	10.4 – 12.4
	Kennedy Road	K1-SHFT4	K1-SHFT5	1,800	1094	41.1 – 45.5
Segment 2	Vodden Street	K1-SHFT5	V1-SHFT1	1,800	1024	30.6 – 45.5
	Vodden Street	V1-SHFT1	OBR1-SHFT1	1,500	840	30.6 – 31.7
	OBR	OBR1-SHFT1	OBR1-SHFT2	1,500	842	31.7 – 33.6
	OBR	OBR1-SHFT2	Provisional Shaft B	1,500	600	33.6 – 34.9
	OBR	Provisional Shaft B	OBR1-SHFT3	1,500	472	34.9 – 37.6
	Bovaird Drive	OBR1-SHFT3	B3-SHFT1	1,500	935	12.4 – 21.4
Segment 3	OBR	OBR1-SHFT3	OBR2-SHFT1	1,500	619	37.6 – 42.1
	OBR	OBR2-SHFT1	OBR2-SHFT2	1,500	857	42.1 – 45.0
	OBR	OBR2-SHFT2	OBR2-SHFT3	1,500	867	42.7 – 45.0
	OBR	OBR2-SHFT3	OBR2-SHFT4	1,500	779	40.8 – 42.7
	OBR	OBR2-SHFT4	OBR2-SHFT5	1,500	720	40.8 – 42.6
	OBR	OBR2-SHFT5	OBR2-SHFT6	1,500	524	42.6 – 44.8
	OBR	OBR2-SHFT6	OBR2-SHFT7	1,500	1026	44.8 – 48.2
	OBR	OBR2-SHFT7	OBR2-SHFT8	1,500	462	46.7 – 48.2
	OBR	OBR2-SHFT8	OBR2-SHFT9	1,500	620	44.9 – 46.7
	OBR	OBR2-SHFT9	Provisional Shaft A	1,500	507	44.9 – 45.0
	OBR	Provisional Shaft A	OBR2-SHFT10	1,500	527	45.0 – 46.3
	Old School Road	OBR2-SHFT10	OS1-SHFT1	1,500	596	43.1 – 46.3
	Old School Road	OS1-SHFT1	OS1-SHFT2	1,500	605	42.0 – 43.1

Note: Refer to Section 7 for shaft siting areas and preferred shaft compound delineation in each segment.

Impact Assessment and Mitigation Measures

The following provides a summary of potential impacts and proposed mitigation measures related to construction of the project to ensure that any short-term disturbances are managed by the best available methods:

- Natural Environment: Potential vegetation removal, wildlife disturbance, and risk of frac-out during trenchless crossings. Mitigation includes ESC plans, wildlife handling protocols, invasive species control and developing a contingency plan for trenchless failure to identify high-risk operation and corresponding mitigation measures.
- Archaeology: Stage 2 assessments and subsequent clearance required at multiple shaft sites; compliance with MCM standards.
- Built Heritage: OBR (CHL 3) is identified as requiring Cultural Heritage Evaluation Report (CHER) and potential Heritage Impact Assessment (HIA).
- Traffic & Community Impacts: Short-term lane/sidewalk closures near shafts will be expected. Traffic management plans will include construction staging to keep traffic/transit moving around work areas. After construction all sites will be restored to pre-construction conditions or better.
- Air Quality and Odour: Air quality impacts are expected to be temporary and localized during construction and negligible during operation, as the enclosed system design does not support continuous or widespread emission pathways. Detailed design will consider odour generation potential, system airflow and ventilation conditions, and any localized odour control needs at access structures. Where necessary, appropriate measures (e.g., venting strategies or localized odour controls) will be incorporated to protect ambient air quality and comply with municipal and provincial requirements.
- Contaminated Groundwater and Dewatering: Potential groundwater contamination impacts are expected to be temporary and primarily associated with construction dewatering activities and receiving waterbody degradation. To minimize risks, groundwater quality will be characterized through hydrogeological investigations, with contaminants of concern assessed against applicable provincial and municipal criteria based on the proposed discharge location. A dewatering and discharge management plan will be developed during detailed design and erosion and sediment control measures will be implemented and maintained throughout construction to prevent sediment-laden water from affecting receiving water bodies.

The above measures will be further confirmed and defined during detailed design phase.

Permitting Requirements

Anticipated permitting requirements are listed below, and will be addressed during the detailed design phase:

- **Federal:** Fisheries and Oceans Canada (Species at Risk Act, Fisheries Act).
- **Provincial:** MTO, MCM, MECP (ECA Form 2 under Transfer of Review, SCA, Consolidated Linear ECA/Air ECA, Environmental Activity & Sector Registry (EASR) for dewatering).
- **Conservation Authorities:** TRCA and CVC permits under Ontario Regulation 41/24.
- **CN Railway:** Work Permit for pipe crossing.
- **TransCanada Pipeline Limited:** written consent for pipe crossing.
- **Municipal:** Road Occupancy Permits, tree removal approvals, sewer discharge agreements, including Public Utilities Coordination Committee (PUCC) approval.

Cost Estimate

The following provides cost estimates related to both the MTBM and TBM options:

- **MTBM Option:** $699.7M (including $78.3M allowances and $116.6M contingency).
- **TBM Option:** $848.7M (including $96.7M allowances and $141.4M contingency).

The cost estimate is based on a Level C estimate, appropriate for the preliminary design stage. Class C estimate is based on schematic/conceptual design or a comprehensive list of project requirements that are detailed enough to support an investment decision (e.g., budget approval). The cost estimate is prepared using measured quantities of all major items of work and is expected to have an accuracy requiring no more than ±15% design allowance. The estimate assumes a two-pass tunnel with precast concrete segments serving as the host and carrier pipe for TBM option. For MTBM option, a single-pass pipe is assumed.

Implementation Schedule

The proposed project implementation schedule is presented as follow:

- **EA & Preliminary Design:** August 2024 to June 2026
- **Detailed Design:** April 2026 to October 2027
- **Construction – Utility Relocations:** Late 2027

- **Construction – Sanitary Trunk Sewer:** April 2028 to February 2031 (three concurrent segments; potentially under one contract)
- **Final Acceptance (2-year warranty):** February 2033

Communications and Consultation

The following summarizes the high-level activities undertaken to support the engagement and consultation program:

- Development of a contact list that is maintained throughout the study.
- Distribution of all notifications to residents, including those fronting the preferred STS route (PIC # 2 Notice) and those within 120 metres of proposed shaft compounds (PIC # 3 Notice) key review agencies, stakeholders, Indigenous communities and interested members of the public.
- Posting of key information to Peel Region's dedicated webpage for the Project.
- Hosting three PICs to provide an opportunity for those interested to learn about the Project and provide feedback on the preferred STS alignment and conceptual design.
- Meeting, engaging and directly corresponding with key review agencies, stakeholders and Indigenous communities, as needed, to introduce the Project and ultimately obtain agreement in principle with the preferred STS alignment and conceptual design.

All comments received were considered and addressed to the extent possible by the Study Team. The Project's **Communications and Engagement** is detailed in **Section 2 and Appendix A.**

Next Steps

Following completion of the EA phase, the detailed design phase will finalize shaft locations, property acquisition including temporary and permanent easements, and permitting, including development of comprehensive traffic management and environmental mitigation plans.

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List of Acronyms

AA _____Archaeological Assessment
AIA_____Agricultural Impact Assessment
ANSI_____Area of Natural or Scientific Interest
APEC_____Areas of Potential Environmental Concern
APU _____Assessment of Past Uses
BHR _____Built Heritage Resources
BTEX _____Benzene, Toluene, Ethylbenzene and Xylenes
CAD_____Canadian
CEAA_____Canadian Environmental Assessment Act
CHER_____Cultural Heritage Evaluation Report
CHL _____Cultural Heritage Landscape
CHR _____Cultural Heritage Report
City _____City of Brampton
CDA_____Construction Disturbance Area
COS_____Contaminated Overview Study
CN _____Canadian National Railway
CTE _____Consent to Enter
CTC _____Credit Valley, Toronto and Region and Central Lake Ontario Region
CUP1 _____Deciduous Plantation Site
CUM1-1____Moist Old Field Meadow
CUS _____Cultural Savannah
CVC _____Credit Valley Conservation
DDRA_____Due Diligence Risk Assessment
DFO_____Department of Fisheries and Oceans Canada
DPCDSB ___Dufferin-Peel Catholic District School Board
EA _____Environmental Assessment
EAA _____Environmental Assessment Act
EASR _____Environmental Activity and Sector Registry
ELC _____Ecological Land Classification
ECA _____Environmental Compliance Approval
ECTS _____Etobicoke Creek Trunk Sewer
ESR_____Environmental Study Report
SGU _____Significant Growth Unit
EPA _____Environmental Protection Act

ESA _____ Environmentally Sensitive Area
ESA _____ Environmental Site Assessment
ESC _____ Erosion and Sediment Control
ESR _____ Environmental Study Report
FCTS _____ Fletchers Creek Trunk Sewer
FODM11 ___ Naturalized Deciduous Hedgerow Ecosite
GDR _____ Geotechnical Desktop Report
GTA _____ Greater Toronto Area
HIA _____ Heritage Impact Assessment
HIAR _____ Hydrogeological Impact Assessment Report
HVA _____ Highly vulnerable Aquifer
ID _____ Internal Diameter
IO _____ Infrastructure Ontario
IPZ _____ Intake Protection Zone
km _____ Kilometre
LCV _____ Long Combination Vehicles
MCM _____ Ministry of Citizenship and Multiculturalism
MCEA _____ Municipal Class Environmental Assessment
MEA _____ Ontario Municipal Engineers Association
MNR _____ Ontario Ministry of Natural Resources
MECP _____ Ontario Ministry of the Environment, Conservation and Parks
m _____ metre
mm _____ millimetre
m^2 _____ square metres
MBCA _____ Migratory Bird Convention Act
MTBM _____ Microtunnel Boring Machine
MTO _____ Ontario Ministry of Transportation
NHIC _____ Natural Heritage Information Centre
NHS _____ Natural Heritage System
OBR _____ Orangeville-Brampton Railway
OCPs _____ Organochlorine Pesticides
OTM _____ Ontario Traffic Manual
PAH _____ Polycyclic Aromatic Hydrocarbons
PAHs _____ Polycyclic Aromatic Hydrocarbons
PCBs _____ Polychlorinated Biphenyls
PDSB _____ Peel District School Board
PHC _____ Petroleum hydrocarbons

PIC _____Public Information Centre
RSC _____Record of Site Condition
PSW _____Provincially Significant Wetland
PTE_____Permission To Enter
PTTS _____Portable Temporary Traffic Signal
QA/QC ____Quality Assurance/Quality Control
Region_____Region of Peel (Peel Region)
RGA _____Rapid Geomorphic Assessment
ROW _____Right-of-Way
RSC _____Record of Site Condition
SAN _____Sanitary Sewer
SAP _____Sampling and Analysis Plan
SARA _____Species at Risk Act
SAR _____Species at Risk
SCA _____Species Conservation Act
SCR _____Soil Characterization Report
SEM _____Sequential Excavation Mining
SGRA_____Significant Groundwater Recharge Area
SHFT _____Shaft
SOCC _____Species of Conservation Concern
SPA _____Source Protection Area
STS_____Sanitary Trunk Sewer
SWH_____Significant Wildlife Habitat
TBD _____To be Determined
TBM_____Tunnel Boring Machine
TCPL _____TransCanada Pipeline Limited
THDM3 ____Dry-Fresh Deciduous Hedgerow Thicket
TIA _____Traffic Impact Assessment
Town _____Town of Caledon
TMP _____Traffic Management Plan
TRCA _____Toronto and Region Conservation Authority
VOC _____Volatile Organic Compounds
WC _____Watercourse
WPA _____Wellhead Protection Area
WRRF _____Water Resource Recovery Facility
WTP _____Water Treatment Plant

1. Introduction

1.1 Background

Peel Region's City of Brampton central wastewater system consists of two separate gravity sanitary trunk sewer systems, Fletchers Creek Sanitary Trunk System (STS) and Etobicoke Creek STS, which ultimately send flow to both the Clarkson Water Resource Recovery Facility and G. E. Booth Water Resource Recovery Facility respectively.

Bill 23, the "More Homes Built Faster Act", by Ontario supports the province's Housing Supply Action Plan. The plan aims to build more homes for Ontario families. With Bill 23, Peel's water and wastewater infrastructure needs are drastically accelerated. Housing targets for 2051 need to be met almost 20 years sooner. That means more than 245,000 residential units in Peel Region; 113,000 in Brampton and 13,000 in Caledon. To address near term water and wastewater infrastructure requirements Peel Region has initiated an accelerated water and wastewater infrastructure program.

To meet the Provincial housing targets for Brampton and Caledon and address the need for increased wastewater capacity by 2030, Peel Region has launched the Kennedy Road Sanitary Trunk Sewer (STS) MCEA (MCEA) Project. Following the Municipal Engineers Association MCEA (as amended in 2024) Schedule C process, this study will develop recommendations to ensure reliable sanitary trunk conveyance for existing and future growth while building flexibility for long-term wastewater management and conveyance capacity expansion. The MCEA study will include comprehensive public and stakeholder consultations, an evaluation of alternatives, and impact mitigation measures, ensuring a transparent, reproducible decision-making process.

The focus of this study is to increase the wastewater conveyance capacity in the Central Brampton and Caledon STS System to service key development growth areas which includes regional and local intensification corridors, major transit station areas, as well as future development lands in the Town of Caledon.

1.2 Study Purpose and Objectives

The purpose of this MCEA study is to provide a comprehensive and environmentally sound planning process which is open to stakeholder, review agency, public and Indigenous community participation to identify the preferred route and associated design concept for a new large diameter sanitary trunk sewer referred to as the Kennedy Road STS. Based on Peel Region's recent forecasted growth, the new sanitary trunk sewer needs to be in service ideally by 2030, or shortly after to meet the near term and long-term needs of the serviced area.

The objectives of this study are to:

1. Develop a comprehensive list of alternative solutions (i.e., routes) for the Kennedy Road STS. This involves the identification of a long list and short list of sanitary trunk sewer route alignments through a multi-step process generally involving:
    - Identification of high-level constraints.
    - Evaluation of downstream and upstream connection points at soon to be constructed Etobicoke Creek Trunk Sewer (ECTS) at Kennedy Road South (north of Highway 407) in Brampton; and Old School Road at Hurontario Street in Caledon.
    - Overlaying each constraint feature onto the grid of potential routes.
    - Screening out least desirable segments and identifying the most appropriate segments (preference for arterial or collector roads).
    - Establishment of continuous routes using the grid segments and connection points.
    - Identification of the final "short list" of STS routes to evaluate in further detail taking into consideration the evaluation criteria, including technical (including geotechnical/hydrogeological data and an assessment of conflicts with existing utilities), Social/Cultural, Economic, and Natural Environmental factors.
    - Arrive at a preferred route
2. Confirm the preferred short list routing option and evaluate routing design concept, including associated construction methods.
3. Provide a preliminary design concept with sufficient detail to understand the extents of the Project, preliminary cost estimate, property and/or easement requirements, and permit and approval requirements.
4. Identify the impacts and associated mitigation measures in constructing and operating the preferred Kennedy Road STS option.
5. Engage the public, agencies, municipalities, and Indigenous communities to understand opportunities and challenges of the Project, gather input into the identification and evaluation of the routing options to identify the preferred sanitary trunk sewer route and associated conceptual design, and address questions and concerns.

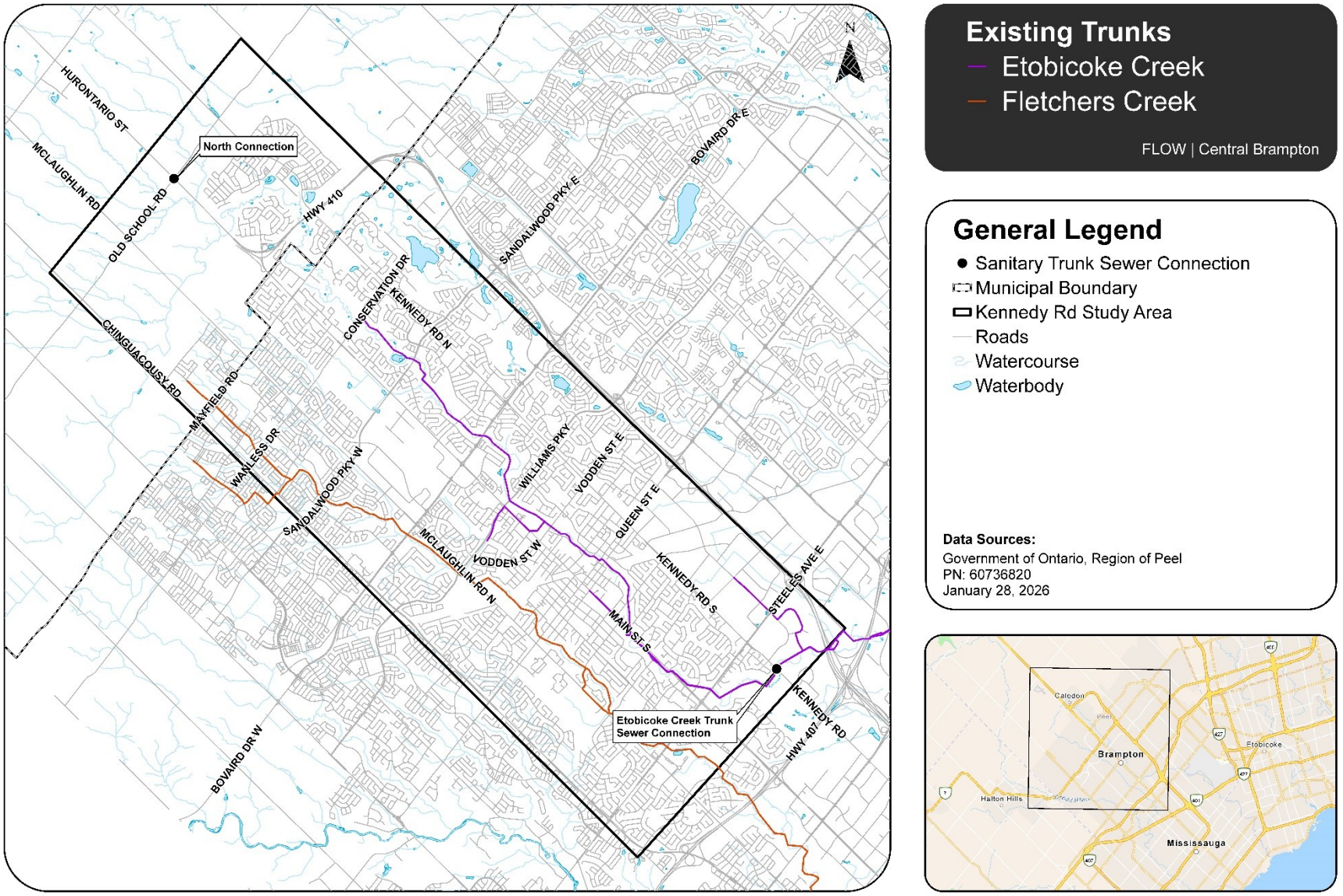
6. Satisfy the requirements of the *Ontario Environmental Assessment Act* through the completion of the Schedule C MCEA planning process, including delivering an ESR for the proposed Kennedy Road STS Project.

The focus of Phase 1 was to identify the study purpose and objectives as outlined above, provide a description of the Study Area profile (existing conditions baseline), define the problem or opportunity statement and outline next steps in the planning process.

1.3 Study Area

The Study Area's boundaries are from Old School Road to the north in Caledon, south of Steeles Avenue to the south in Brampton, Highway 410 to the east and Chinguacousy Road to the west, as shown in Figure 1-1. This area encompasses rapidly developing communities within Brampton and Caledon.

Figure 1-1: Kennedy Road Sanitary Trunk Sewer EA Study Area



1.4 MCEA Planning Process

1.4.1 Overview

All municipalities in Ontario are subject to the provisions of the Ontario *Environmental Assessment Act* and its requirements to prepare an Environmental Assessment for applicable public works projects. The Ontario Municipal Engineers Association "MCEA" manual (as amended in February 2024) provides municipalities with a phased planning procedure, to plan and undertake all municipal sewage, water, stormwater management and transportation projects that occur frequently, are usually limited in scale and have a predictable range of environmental impacts and applicable mitigation measures. This study is being undertaken in accordance with the 2024 "MCEA" manual.

In Ontario, infrastructure projects are subject to the MCEA process and must follow a series of mandatory steps as outlined in the MCEA manual. The MCEA manual consists of five phases and the application of the phases depends on the MCEA Schedule that applies to a project. The phases are summarized below, and shown in Figure 1-2:

- Phase 1 – Problem or Opportunity: Identify the problems or opportunities to be addressed and the needs and justification.
- Phase 2 – Alternative Solutions: Identify alternative solutions to the problems or opportunities by taking into consideration the existing environment, and establish the preferred solution considering public and agency review and input.
- Phase 3 – Alternative Design Concepts for the Preferred Solution: Examine alternative methods of implementing the preferred solution based upon the existing environment, public and agency input, anticipated environmental effects and methods of minimizing negative effects and maximizing positive effects.
- Phase 4 – ESR: Document in an ESR (ESR), a summary of the rationale, planning, design and consultation process for the Project as established through Phases 1 to 3 above and make such documentation available for scrutiny by review agencies and the public.
- Phase 5 – Implementation: Complete contract drawings and documents, proceed to construction and operation, and monitor construction for adherence to environmental provisions and commitments. Also, where special conditions dictate, monitor the operation of the completed facilities.

Figure 1-2: Municipal Class EA Schedule C Planning Process



The MCEA process ensures that all projects are carried out with effectiveness, efficiency and fairness. The process serves as a mechanism for understanding economic, social and environmental concerns while implementing improvements to municipal infrastructure.

1.4.2 Project Planning Schedules

As per the 2024 Municipal Engineers Association "MCEA" manual, municipal infrastructure undertakings are classified as exempt, eligible for screening, Schedule B, and Schedule C with each classification having different requirements. The selection of the appropriate schedule is dependent on the anticipated level of environmental impact, and for some projects, the anticipated construction costs and/ or results of a screening process for eligible projects. Projects are categorized according to their environmental significance and their effects on the surrounding environment.

Based on the 2024 Municipal Engineers Association "MCEA" manual, this Project (new sanitary trunk sewer) is categorized as a Schedule B planning activity (involves land acquisition for the establishment of a new sanitary trunk sewer outside of an existing road or utility corridor). However, given the scale and complexity of this Project, the Region decided to elevate the Project from a Schedule B to a Schedule C.

The following describes the MCEA planning schedules in accordance with the 2024 Municipal Engineers Association "MCEA" manual:

- **Exempt Projects:** Projects which were formerly classified as Schedule A and A+ projects and include various municipal maintenance, operational activities, rehabilitation works, minor reconstruction or replacement of existing facilities, and new facilities that are limited in scale and have minimal adverse effects on the environment. These projects are exempt from the requirements of the *Ontario Environmental Assessment Act*.[1]
- **Eligible for Screening to Exempt**: Some projects may be eligible for exemption based on the results of a screening process. The applicable screening is completed to determine whether a project is eligible for exemption from the *Ontario Environmental Assessment Act* or proceed with the applicable Schedule B or C process.
- **Schedule B:** Projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process (Phases 1 and 2), involving mandatory contact with directly affected public and with relevant review agencies to ensure that they are aware of the project and that their concerns are addressed. If there are no outstanding concerns, then the proponent may proceed to implementation. At the end of Phase 2, a project file documenting the planning process followed through Phases 1 and 2 shall be finalized and made available for public and agency review. However, if a concern is raised related to Aboriginal and Treaty Rights which cannot be resolved, a Section 16 Order may be requested and considered by the Minister of the Environment, Conservation and Parks. Schedule B projects generally include improvements and minor expansions to existing facilities or smaller new projects.
- **Schedule C:** Projects have the potential for significant adverse environmental effects and must proceed under the full planning and documentation (Phases 1 to 4) procedures specified in the MCEA manual. Schedule C projects require that an ESR be prepared and filed for review by the public and review agencies. If concerns related to Aboriginal and Treaty Rights are raised that cannot be resolved, then a Section 16 Order may be requested. Schedule C projects generally include the construction of new facilities and major expansions to existing facilities.

1. On June 19, 2019, as part of the More Homes, More Choices Act the Environmental Assessment Act was amended to exempt Class A and A+ projects from MCEA requirements as they were considered to be low impact projects with minimal environmental effects. The 2023 MCEA document also allows for some Schedule B projects to be exempt based on the results of an archaeological screening process.

To summarize, while the Kennedy Road STS Project is a Schedule B planning activity recognizing the scale and complex nature of the Project including Study Area characteristics and the potential impacts on the environment, Peel Region has elevated the Project from Schedule B to C. As such Phases 1, 2, 3 and 4 of the MCEA planning process as described above apply to this study.

By planning the Project as a Schedule C, Peel Region is ensuring the maximum detail of study, including examination of alternative sanitary trunk sewer routing options including design concepts, in addition to public and agency consultation review.

1.4.3 Proposed Municipal Project Assessment Process

As part of the Environmental Assessment Modernization proposal, the province of Ontario proposed a regulation to revoke the MCEA and make a streamlined MCEA regulation with a time-limited process that focuses on certain higher-risk water, shoreline and sewage projects.

Once approved the new regulation will replace the current 2024 MCEA with a streamlined Municipal Project Assessment Process (MPAP) where only identified higher risk municipal infrastructure planning projects would continue to be subject to the *Ontario Environmental Assessment Act*. The new regulation would take a project-list approach by describing the municipal infrastructure types that would follow the Environmental Assessment process. Only projects listed in the regulation would have Ontario Environmental Assessment Act requirements. It is proposed that some projects deemed to be low risk, which are currently subject to the MCEA, would no longer require its application. This would include all projects currently subject to Schedule B of the MCEA including new sanitary trunk sewers not located within an existing road allowance or utility corridor.

On August 6, 2027, the Province issued notice that as of January 1, 2027 the MCEA process will be revoked and replaced with two new processes: MPAP and the Archaeological Assessment Process (AAP). Recognizing the Project timeline (Notice of Completion to be issued in Fall 2026), Peel Region has followed the current 2024 MCEA planning process.

2. Communications and Engagement

2.1 FLOW | Central Brampton Program

Flow | Central Brampton is a program designed to build water and wastewater infrastructure projects, faster, throughout Brampton. The Province plans to build 1.5 million more homes in Ontario over the next decade—with 113,000 in City of Brampton. These provincial housing targets have drastically increased the demand for water, wastewater and road infrastructure.

In support of the Province's plan to meet local housing needs, the City of Brampton has advanced its Housing Brampton strategy and reinforced its commitment through the Municipal Housing Pledge. In response, Peel Council has approved over $1 billion in capital investments to support these services, reinforcing our commitment to building the essential water and wastewater infrastructure needed for our communities, now and in the future.

Flow | Central Brampton will meet these demands, grouping many projects together under one program umbrella and driving efficiency. Flow | Central Brampton's 30+ water and wastewater projects cover an approximate geographical area from Ray Lawson Boulevard in the south, Old School Road in the north, Mississauga Road in the west and Torbram Road in the east.

As part of the program management approach, the Kennedy Road STS Project is being undertaken and will address sewage conveyance capacity needs while supporting anticipated growth and protecting the environment.

2.2 Kennedy Road STS Project Communications and Engagement Plan

In addition to addressing questions and concerns, the goal of this study, in terms of engagement, includes working closely with the public, agencies, municipalities, and Indigenous communities to understand opportunities and challenges of the study, gather input into the alternative solutions to evaluate and identify the preferred sanitary trunk sewer alignment and prepare a conceptual design. The following summarizes the high level activities undertaken to support the engagement and consultation program:

- Development of a contact list that is maintained throughout the study.
- Distribution of all notifications to residents including those fronting the preferred STS route (PIC # 2 Notice) and those within 120 metres of proposed shaft compounds (PIC # 3 Notice), key review agencies, stakeholders, Indigenous communities and interested members of the public.

- Posting of key information to Peel Region's dedicated webpage for the Project.
- Hosting three PICs to provide an opportunity for those interested to learn about the Project and provide feedback on the preferred STS alignment and conceptual design.
- Meeting and directly corresponding with key review agencies, stakeholders and Indigenous communities, as needed, to introduce the Project and ultimately obtain agreement in principle with the preferred STS alignment and conceptual design.

All comments received were considered and addressed to the extent possible by the Study Team. The Project's **Communications and Engagement Plan** is detailed in **Appendix A1**.

2.3 Project Contact List

A contact list has been compiled of the relevant key review agencies, Indigenous communities, Conservation Authorities, stakeholders, as well as interested members of the community that have responded to the engagement tactics, such as the notifications and Public Information Centres (PICs). This list was maintained and updated as the study progressed. External agencies, stakeholders and Indigenous rights holders include, among others:

- Indigenous Nations and Indigenous rights holders
- CVC
- TRCA
- Rail including Canadian National Railway/ Metrolinx and GO Transit
- Federal Agencies
- Provincial Agencies
- Municipal Agencies
- Development industry
- School Boards
- Emergency services
- Business and community organizations
- Social media and local new outlets
- Utilities
- Property owners

The contact list is provided in **Appendix A2**.

2.4 Stakeholder Communications

2.4.1 Peel Region

Peel Transportation

Recognizing the potential impacts of the project on region and local road networks, the Peel Regions' Transportation division was engaged through the process to provide input to the development of traffic models and review of the Traffic Impact Assessment Report (refer to Section 9.7) to ensure that it adequately addresses impacts to local and regional road networks during construction. Region representatives also attended some meetings with the City of Brampton's Transportation division to provide input to the traffic models.

Peel Region's Water and Wastewater Division

As part of the Project Team, representatives from the division provided input to all phases of the project including identification of the preferred sanitary sewer route, construction methodology evaluation, and evaluation of shaft compound alternatives, which included two workshops.

2.4.2 City of Brampton

Kick-off Meeting

An introductory EA kickoff meeting was held with the City of Brampton (the City) on December 9, 2024 to introduce the Flow Program and the Kennedy Road STS EA. Project timelines and schedule were discussed with agreement to share EA background studies with the Town. Representatives from the City's Capital Works, Transportation Engineering and Planning, Traffic Operations, Development Services and Park were in attendance. The preliminary routing options were discussed, as well as coordination opportunities and establishing a "one-window" contact with the City.

Transportation

Three meetings were held with City of Brampton's Transportation Division to scope development of traffic models and review modelling results to confirm potential impacts to road networks during construction. The City also reviewed the Traffic Impact Assessment (TIA) Report as part of the Draft ESR circulation prior to issuing of the Notice of Completion.

Parks and Forestry

As part of the Flow program, the Kennedy Road STS project was introduced with particular emphasis on coordination with City's Rail to Trail Project. City's Parks and Forestry department will continue to be actively engaged through the Flow Program.

A meeting was held on July 25, 2025 as part of the Flow Program to discuss coordination of Flow City of Brampton projects in relation to the Orangeville-Brampton Railway (OBR) multipurpose trail project. The meeting also confirmed the City of Brampton's protocols for tree protection plans and tree removals.

The Region also shared supporting studies' reports (e.g., Natural Environment Report, Fluvial Geomorphic Assessment Report, Stage 1 Archaeological Assessment, Cultural Heritage Report) with the City's Rail to Trail Project Team. The City has reviewed the Draft ESR prior to issuing of the Notice of Completion. Comments primarily related to mitigation of impacts to and restoration of parks and open spaces, construction phasing, in addition to ensuring access for maintenance and operations. These will be accordingly addressed in the detailed design phase.

2.4.3 Town of Caledon

Engineering Public Works & Transportation

An introductory EA kickoff meeting was held with the Town on December 9, 2024 to introduce the Flow Program and the Kennedy Road STS EA. Project timelines and schedule were discussed with agreement to share EA background studies with the Town. Representatives from the Town's Development Engineering and Development planning were in attendance. Applicable development applications and their sanitary servicing strategies were also discussed. The draft ESR was also shared with the Town prior to issuing of the Notice of Completion. Comments from the Town's Capital Engineering Department primarily related to ensuring that any disturbances to Old School Road including recent improvements will be restored to original condition or better and the need to maintain drainage in and around shaft compound areas during construction. Other comments included the need to review and confirm if removal of existing barriers (i.e., rails and ties) within the OBR if required to facilitate construction access. These items will be addressed during the detailed design phase.

Rail to Trail

A Rail to Trail Project Coordination meeting was held on August 25, 2025 to provide a status update on the Kennedy Road STS EA which included discussions on how potential shaft compounds within the OBR corridor will be designed and integrated with the future Rail to Trail project.

The Region also shared EA Phase 2 background reports (e.g., Natural Environment Report, Fluvial Geomorphic Assessment Report, Stage 1 Archaeological Assessment, Cultural Heritage Report, Agricultural Impact Assessment) with the Town's Rail to Trail Project Manager.

The Town of Caledon initiated Rail to Trail Project kickoff meeting on December 9, 2025. Representatives from the Kennedy Road STS Project Team attended the meeting with Town's consultant and provided input with respect to the Kennedy Road STS planning, design, and construction schedule.

Realty

An introductory meeting with the Town's Realty Department was held on February 19, 2025 to discuss Kennedy Road STS project and Permission to Entre (PTE) requirements. Discussion items included confirming PTE requirements and timelines with a focus on using streamlined process with the aim to reduce turnaround times, establishing line of communication to share EA information, schedule and next steps.

Engagement with the Town's Realty department continued as part of Flow communications program meetings which included status updates on the Kennedy Road STS project.

2.4.4 Conservation Authorities

Toronto and Region Conservation Authority (TRCA)

A project pre-consultation meeting was held with TRCA on December 12, 2024 which introduced the Flow Program management approach, provided an overview of the project, including study area and natural environment desktop existing conditions. The long-list of alternative routing options being considered was also shared along with the short-listed south and north routes.

In response to the Notice of Commencement and PIC #1, TRCA confirmed their interest in the project due to potential impacts on natural systems, natural hazards, and climate change resilience within the study area. TRCA emphasized the need to avoid, mitigate, or restore impacts to natural hazards and wetlands, with compensation considered only as a last resort.

TRCA also requested ongoing coordination throughout the EA process, including being engaged at key project milestones. They noted that parts of the study area fall within Significant Groundwater Recharge Areas (SGRA) and Highly Vulnerable Aquifers (HVA).

As part of TRCA's review of PIC #2, in a letter dated June 8, 2025, they advised that any work on TRCA-owned lands will require PTE and archaeological screening and encourages the Region to locate shaft compounds and new infrastructure outside TRCA

regulated areas wherever possible. The Study Team confirmed that there are no TRCA-owned properties impacted by the preferred route and as such, TRCA archaeological screening is not required. In addition, TRCA noted that infrastructure construction can significantly affect watercourses and wetlands and requested clearer comparative information—such as the number of watercourse and wetland crossings—for each alternative route to support the selection of a preferred option (addressed through Phase 2 Evaluation). TRCA also noted grading within wetlands should be minimized, with impacts quantified at detailed design.

From a technical standpoint, TRCA also noted the requirement for a geotechnical study, slope stability assessments near valley slopes, appropriate design and implementation of trenchless works and shafts, development of construction provisions and protection measures, determination of required earthworks and grading strategies to maintain global stability, and submission of complete engineering drawings detailing all design specifications. The Project Team acknowledged that this information will be accordingly addressed during the detailed design and permitting phase.

The Project Team distributed the draft Natural Environment Report and Fluvial Geomorphology Reports for TRCA's review on September 11, 2025. Comments on these reports were received from TRCA on October 8, 2025 and have been addressed in the final reports (included in Appendices D and E, respectively). TRCA received all EA notices and also attended regular Flow Program update meetings which included an update on the Kennedy Road STS project among other Flow program projects.

TRCA provided acknowledgement of PIC #2 documents and provided additional comments primarily relating to avoiding placement of shaft locations within regulatory floodlines and sensitive natural heritage features where possible.

On December 11, 2025, TRCA staff acknowledged receipt of PIC #3 documents, and on January 20, 2026 requested additional clarification on how the Region will protect for any future trail initiatives related to important component of the TRCA Trail Strategy that straddles both CVC and TRCA jurisdictions. The Project Team advised that the Region has been working closely with both City of Brampton and Town of Caledon including the Rail to Trail Project design teams to ensure that the proposed sanitary trunk sewer is properly integrated with the future multi-use trail which will be constructed after the new sewer is in place and operation.

TRCA was also circulated the draft ESR including full Appendices on February 23, 2026. Comments primarily related to ensuring coordination with other overlapping projects within Peel Region, City of Brampton, Town of Caledon and MTO during detailed design and permitting process, in addition to provision of erosion prevention and sediment control measures during detailed design, permitting and construction phases.

All correspondence with the TRCA is included in Appendix A3A.

Credit Valley Conservation (CVC)

A project pre-consultation meeting was held with CVC on December 11, 2024 which introduced the Flow Program management approach, provided an overview of the project, including study area and natural environment desktop existing conditions. The long-list of alternative routing options being considered was also shared along with the short-listed south and north routes.

In response to the Notice of Commencement (November 21, 2024) and PIC #1 presentation materials (December 11, 2024), CVC provided comments pertaining to CVC permitting requirements where portions of the sanitary trunk sewer fall within regulated areas, environmental protection considerations, and expectations for continued engagement throughout the EA process. CVC also noted that their scour assessment guidelines should be considered for all watercourse crossings, and stated that infrastructure such as sewers and maintenance holes should be located outside hazard areas associated with these watercourses, unless justified otherwise.

CVC also provided comments on the draft Natural Environment Report and Fluvial Geomorphology Report which have been addressed in the final reports (included in Appendices D and E, respectively). CVC received all EA notices and also attended regular Flow Program update meetings which included an update on the Kennedy Road STS project among other Flow Program projects.

CVC was also circulated the draft ESR including full Appendices on February 23, 2026. Comments primarily related to addressing potential impacts of dewatering associated with tunnelling and shaft construction on adjacent wetland hydrology, avoiding tree removals within erosion hazard associated with Fletcher's Creek, and minimizing construction encroachment into regulated wetlands – all of which to be reviewed and addressed during the detailed design and permitting phase.

2.4.5 Provincial Agencies

The following provides a summary of engagement and correspondence with key provincial agencies which included issuance of all notices as per the project contact list (refer to Appendix A2). A copy of all formal agency correspondence is included in Appendix A3A.

Ministry of Transportation Ontario (MTO)

A project pre-consultation meeting was held with MTO on January 21, 2025 which introduced the Flow Program management approach, provided an overview of the project, and MCEA process. The routing methodology, including the long-list of alternative routing options being considered were also shared along with the short-listed south and north routes. Sanitary trunk sewer connection points at Old School

Road and Hurontario Street (Highway 10) were discussed and MTO's control area including need for encroachment permit were confirmed.

MTO received all EA notices and also attended regular Flow Program update meetings which included an update on the Kennedy Road STS project among other Flow Program projects. MTO was also circulated the draft ESR on February 23, 2026. MTO comments primarily related to clarification related to the interfacing projects with MTO which will be captured in the detailed design phase.

Infrastructure Ontario (IO)

Infrastructure Ontario received all EA notices. No correspondence was received to date from IO.

Ministry of the Environment, Conservation and Parks (MECP)

On March 11, 2025 MECP provided an acknowledgement letter in response to the Notice of Commencement and PIC #1, identified Indigenous communities potentially impacted by the project, in addition to duty to consult requirements and ministry's "areas of interest" (e.g., source water protection, climate change considerations, air quality, dust and noise impacts, ecosystem protection and restoration, species at risk, surface and groundwater, contaminated site, etc.). Ministry areas of interest are being addressed within this ESR. The MECP was also circulated the draft ESR on February 23, 2026. Comments on the draft ESR primarily related to the potential generation of odours and how they will be further analyzed and mitigated during the detailed design stage.

In response to MECP's comments, a screening-level air quality assessment was added and odour control and mitigation measures were expanded upon (see Section 9.11.2 and Section 9.11.3).

Ministry of Citizenship and Multiculturalism (MCM)

On December 30, 2024 the MCM provided an acknowledgement of the Notice of Commencement and PIC #1 and noted guidance on identifying and addressing potential impacts to cultural heritage resources including archaeological resources and built heritage resources and cultural heritage landscapes.

The MCM was also circulated the draft ESR on February 23, 2026 which included the Stage 1 Archaeological Assessment Report and Cultural Heritage Report. All Ministry comments related to the Cultural Heritage Report and Stage 1 Archaeological Assessment Report were addressed prior to the issuance of Notice of Completion and ESR filing. The revised Stage 1 Archaeological Assessment Report in response to Ministry's comments is provided in Appendix H.

Ministry of Indigenous Affairs

On December 4, 2024, the Ministry acknowledged receipt of the Notice of Commencement and PIC #1 and noted a new contact person for future notices who was added to the project contact list accordingly.

Ministry of Natural Resources (MNR)

On December 27, 2024 and January 13, 2025, the MNR acknowledged receipt of the Notice of Commencement and PIC and provided an information package to support the environmental assessment process as well as its regulatory authority to issue authorizations, permits licenses and approvals. The Ministry also noted the need to complete a screening of natural heritage resources to confirm MNR's interests.

The MNR was also circulated the draft ESR on February 23, 2026 for review. No comments were received.

2.4.6 Other Agencies and Stakeholders

Canadian National (CN) Rail

A project pre-consultation meeting was held with CN Rail on March 14, 2025 which introduced the Flow Program management approach, provided an overview of the Kennedy Road STS project including the associated CN Rail crossings within the study area. The proposed Kennedy Road CN Rail trenchless crossing was presented and discussed and based on information presented CN Rail noted at this time they have no major concerns and will provide more comments after design and engineering drawings are submitted. CN Rail also noted that the need and timing for flagging will be confirmed at preliminary design stage.

CN Rail provided as-built drawings and requirements and was circulated all EA notices. CN Rail also attended quarterly Flow Program update meetings which included an update on the Kennedy Road STS project among other Flow Program projects. CN Rail was also circulated the draft ESR on February 23, 2026. To facilitate CN's review, the project team provided specific information on where the proposed STS interacts with the CN rail corridor in June 2026. CN will continue to be engaged throughout the detailed design and approvals stages.

Metrolinx

A project pre-consultation meeting was held with Metrolinx on January 23, 2025 which introduced the Flow Program management approach, provided an overview of the Flow Program projects which had CN Rail crossings, including the Kennedy Road STS project. The proposed Kennedy Road railway trenchless crossing was presented and discussed and Metrolinx noted that the Kennedy Road railway bridge is likely owned by

CN Rail (CN Rail ownership confirmed) and Metrolinx has rights to run Kitchener–Waterloo-Toronto commuter trains.

Metrolinx was circulated all EA notices and the draft ESR on February 23, 2026. No comments were received.

TransCanada Pipelines

In response to Notice of PIC#3, on behalf of TransCanada Pipelines, MHBC Planning submitted a letter on January 20, 2026 requesting that the TransCanada Pipeline right-of-way should be shown on all drawings related to the proposed OBR2-SHFT2A compound shaft to confirm design considerations as the design process advances. The letter also provided restrictions for siting within and outside of their right-of-way in addition to the need for written consent where their right-of-way is impacted. The letter also provided design guidance for the TransCanada pipeline crossing.

On January 28, 2026, the Region responded and acknowledged that the majority of TransCanada comments will be addressed as EA commitments that will be carried forward in the preliminary and detailed design phases. In addition, the Region requested GIS information for the TransCanada Pipeline right-of-way within the study area.

TransCanada will continue to be involved in the detailed design and written consent approval process. Correspondence with TransCanada is provided in **Appendix A3B.**

Peel District School Board (PDSB)

The PDSB was provided with all EA notices and further correspondence was issued with respect to potential impacts to school board properties which in turn included a follow-up meeting with the Project Team to understand potential permanent and temporary easements related to proposed shaft compounds at Turner Fenton Secondary School and Sir Wilfrid Laurier Public School.

A meeting was held with a representative of the PDSB to discuss the two proposed shaft compound at the Turner Fenton Secondary School and Sir Wilfrid Laurier Public School. Discussions included request for permanent and temporary easements. following the meeting, an email was received from PDSB's planning department that indicated they did not support the proposed shaft compounds due to negative impact to property and operation of the school. PDSB will continue to be involved in the detailed design and property negotiations.

Dufferin-Peel Catholic District School Board (DPCDSB)

Following the issuance of the PIC#3 Notice, it was noted that the DPCDSB was not included in the project's Contact List. As such, AECOM reached out to a representative at DPCDSB's planning department who set up a general mailbox (Planning@DPCDSB.org)

that the project team can use for all notifications going forward. The PIC#3 Notice with links to the project webpage were also forwarded to the DPCDSB's general mailbox.

Long Combination Vehicles (LCV) Companies

The consultation process included outreach with two separate companies that had LCV permits to operate on City and Regional roadways to travel to and from a specific property and the 400 series highway system. Designated LCV routes within the Study Area include roads that accommodate LCVs include Kennedy Road, First Gulf Boulevard, Biscayne Crescent, and Steeles Avenue.

- PepsiCo Canada

  Multiple email exchanges were undertaken to identify potential traffic impacts during construction and understand permit requirements. PepsiCo will continue to be involved in the detailed design and review of potential impacts to proposed lane closures within the LCV route to better understand mitigation measures during construction. PepsiCo provided AECOM with the LCV permit via email on August 25, 2025. PepsiCo confirmed via email that 13-16 LCVs operate into Brampton per week on average, including weekends and weekdays.

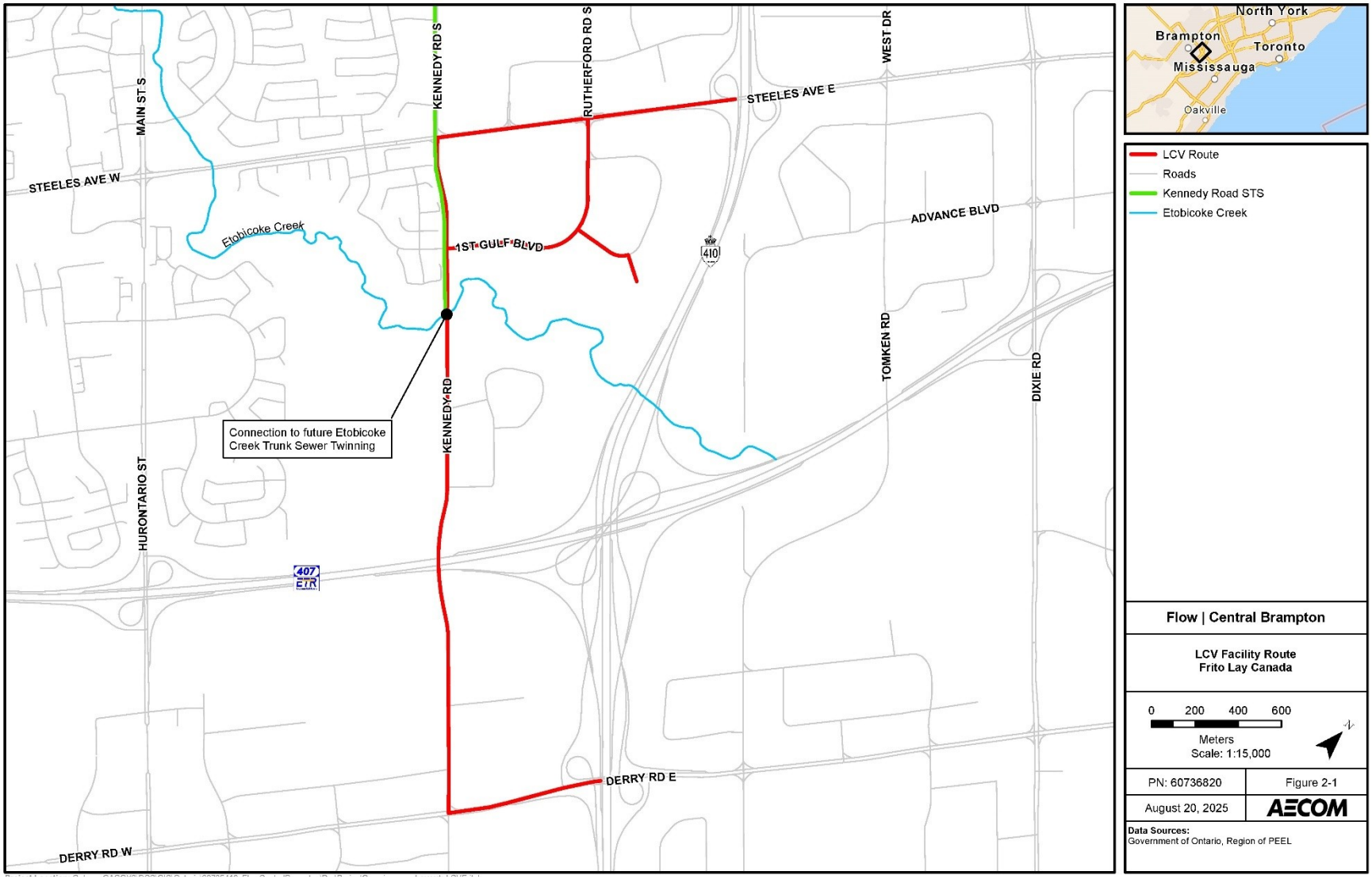
  The Certificate of Origin/Destination issued for PepsiCo Canada ULC (#OD0007) specifies an inbound route to the Frito Lay Canada Facility on Clipper Court via Highway 410 northbound to Steeles Avenue East, Steeles Avenue East to First Gulf Boulevard, and First Gulf Boulevard to Biscayne Crescent. The egress route is specified via Biscayne Crescent, First Gulf Boulevard to Kennedy Road South, Kennedy Road South to Derry Road, and Derry Road to Highway 410 southbound. Inbound travel is not permitted on weekdays from 6:00 AM to 7:00 AM. Outbound travel is not permitted on weekdays from 7:00 AM to 9:30 AM and from 3:30 PM to 6:30 PM. The LCV route is shown below in Figure 2-1.

- GLS

  Multiple telephone and email outreach efforts were made to contact GLS for LCV information. In October 2025, the Study Team was able to connect with GLS via telephone, and they noted having one permit in Brampton but is rarely used as GLS operates a new location in Vaughan, Ontario. GLS noted they would provide the permit via email, but did not respond after two follow-ups.

  The Project team will continue to try and reach out to GLS in the detailed design phase to review potential impacts to proposed lane closures within the LCV route and to better understand mitigation measures during construction.

Figure 2-1: LCV Facility Route to PepsiCo's Frito Lay Canada Facility



2.4.7 Developers

Extensive consultation and engagement were undertaken with the development community throughout the EA process. This included having a dedicated afternoon session for the development community as part of each in-person PIC.

The following developers were engaged and consulted through the EA process:

- **Building Industry Land Development (BILD) Association**
  In order to maximize engagement with the broader land development community, all PIC notices and materials were provided to a representative from BILD who circulated the materials to the BILD membership list.

- **Orlando Corporation**
  Representatives from Orlando Corporation attended PICs #1 and #2. Following PIC #1 Orlando Corporation submitted a letter on February 6, 2025 requesting expansion of the study area to include water and wastewater servicing for the Hurontario Employment Secondary Plan Area. The Region responded by letter on April 16, 2025 providing rationale for maintaining the current study area boundary while noting that servicing of the subject secondary plan will be addressed through the FLOW South Caledon Water and Wastewater Program.

- **Brookvalley Management Inc. (Brookvalley)**
  Representative from Brookvalley attended PIC #1. Following PIC #1 Brookvalley provided feedback regarding how their Mayfield West land holdings could be serviced and suggested alternative routing options (e.g., using Hurontario Street). On February 11, 2025 the Region responded providing clarification of the long-list and short-list routing evaluation process which resulted in the elimination of Hurontario Street. The Region also confirmed that the proposed construction method will be trenchless which will significantly reduce impacts to residents along north short-listed routes with the exception of proposed shaft compounds.

- **David Schaeffer Engineering Ltd. (DSEL)**
  Correspondence related to request for information with DESL is included in Appendix A3C.

- **Gillco Management Corporation**
  On April 28, 2025 a representative from Gillco Management Corporation c/o Ten King Holding Inc. submitted a letter requesting expansion of the study area to include water and wastewater servicing for the Hurontario Employment Secondary Plan Area. The Region responded by letter on May 13, 2025

providing rationale for maintaining the current study area boundary while noting that servicing of the subject secondary plan will be addressed through the FLOW Caledon South Water and Wastewater Program.

- Hurontario Employment Secondary Plan Area Land Owner Group
  - On February 6, 2025, on behalf of the Hurontario Employment Land Owner Group, Glen Schnarr & Associates Inc. sent a letter to the Region providing development status of the Hurontario Employment Secondary Planning Area and requesting expansion of the study area to include water and wastewater servicing for the Hurontario Employment Secondary Plan Area. The Region responded by letter on April 16, 2025 providing rationale for maintaining the current study area boundary while noting that servicing of the subject secondary plan will be addressed through the FLOW South Caledon Water and Wastewater Program.
  - On February 13, 2025 TYLin International Canada Inc. (TYLin) sent a letter to the Region providing input to how deep the new sewer should be in order to facilitate servicing of their land, and requesting expansion of the study area to include water and wastewater servicing for the Hurontario Employment Secondary Plan Area. The Region responded by letter on April 16, 2025 providing rationale for maintaining the current study area boundary while noting that servicing of the subject secondary plan will be addressed through the Flow South Caledon Water and Wastewater Program. Additionally, the Region noted that the anticipated depth of the new sewer will be sufficient to service the Secondary Plan Area by gravity.
- Argoland
  - Representatives from ARGO attended PIC#3 as the northerly sanitary trunk sewer connection point impacts their proposed North Fields residential development at the southeast corner of Old School Road and Hurontario Street. In addition, a meeting was held on December 16, 2025 to confirm their development status (plan of subdivision approved) and review property requirements related to the proposed shaft compound at Hurontario Street and Old School Road. Following discussions, the proposed shaft compound location was refined to minimize impacts to ARGO's proposed sales centre.
  - ARGO will be engaged through the detailed design of the Old School Road STS, including shaft compounds.
- Centennial Mall

  A meeting was held with representatives from Centennial Mall to discuss the proposed shaft compound at the southeast corner of Kennedy Road and

Vodden Street, within the mall's parking area. Discussions included request for permanent and temporary easements. The representatives expressed concern with the temporary loss of parking and impacts to businesses within the mall. Centennial Mall will continue to be involved in the detailed design and securement of the temporary and permanent easements.

- Shanonland
  A representative from David Schaeffer Engineering Ltd. (DSEL) attended PIC # 3 to review and discuss the proposed temporary access road from the east side of McLaughlin Road through a future development site (Shanonland - north side of Tim Manely Avenue at OBR). The representative noted that the development is currently at the draft plan functional servicing stage. It was agreed that the Region will meet with DSEL to further discuss the proposed temporary access road to the OBR. DSEL will continue to be involved in the detailed design and securement of the temporary easement.

All correspondence with the development community is provided in Appendix A3C.

2.4.8 Utilities

The following utility companies received all EA notices.

- Alectra
- Acronym Solutions (formerly Hydro One Telecom)
- Hydro One
- Enbridge Gas
- Bell Canada
- Rogers Cable
- Telus
- Zayo (formerly Allstream)

In addition, as part of Phase 3 of the MCEA process, the Project Team circulated preliminary drawings that illustrated the recommended preferred alignment for the new sanitary trunk sewer, along with proposed shaft compound locations and requested the above listed utility companies to review these drawings to help identify any major infrastructure that may be impacted (e.g., existing or planned) by the proposed alignment and/or shaft compound. Received mark-up drawings were considered in the evaluation of alternative design concepts.

All impacted utilities will continue to be involved in the detailed design and approvals phase.

2.4.9 Engagement with Indigenous Nations and Rights Holders

2.4.9.1 Identifying Indigenous Nations and Rights Holders

Prior to initiating notifications, the Region submitted a project information form to MECP who accordingly provided through a letter of acknowledgement a list of Indigenous communities who require notification through the MCEA process.

2.4.9.2 Notifications to Indigenous Nations and Rights Holders

The following Indigenous communities received all EA Notices:

- Beausoleil First Nation
- Chippewas of Georgina Island First Nation
- Chippewas of Rama First Nation
- Haudenosaunee Development Institute (HDI)
- Huron-Wendat Nation
- Mississaugas of the Credit First Nation
- Six Nations of the Grand River

The above communities were also offered the opportunity to participate in Natural Environment inventory and future archaeological assessment field investigations.

On February 27, 2025, the Six Nations of the Grand River (SNGR) expressed interest in participating in the upcoming archaeological field investigations. Similarly, on March 14, 2025 the Huron-Wendat Nation expressed interest in participating in all archaeological fieldwork for the project, as well as receiving copies of the draft reports for review and comments.

The HDI expressed interest in participating in the Natural Heritage field investigations and subsequently attended field investigations with the AECOM ecologists on August 28 to 29, 2025.

As part of PIC #3 notification on December 10, 2025, all Indigenous communities were also circulated the Draft Technical Reports (Natural Environment Report, Fluvial Geomorphology, Cultural Heritage and the Stage 1 Archaeological Assessment (AA) Report) for review. Several follow up reminders were sent asking if comments were forth coming and the deadline for comments was extended at the request of SNGR. On July 23, 2026 SNGR provided comments on the Natural Environment Report. Comments received primarily related to requests for additional field work, stronger habitat protection and restoration commitments, long-term monitoring, and continued Indigenous involvement through the design stage. It is noted that these comments are directly aligned with the expectations set out in SNGR Environmental Levy Policy (refer to Appendix A3D), This policy was adopted by the SNGR Elected Council and provides

a framework to address environmental degradation and offset impacts of development within SNGR's traditional territory and the Haldimand Tract.

These Indigenous communities will continue to be involved in the project, including participation in Stage 2 AA fieldwork as part of the detailed design phase.

All correspondence with the Indigenous community is provided in Appendix A3D.

2.4.10 Public

Throughout the MCEA Process, including feedback from PIC attendees, several comments were received from the public.

All correspondence with general public including responses can be found in Appendix A3A.

2.4.11 Summary of Feedback Received and Engagement

In summary, many steps were undertaken to proactively inform the public, Indigenous communities, and key stakeholders about this Municipal Class EA study, obtain their input, and address their comments or concerns as much as possible as they arose. Through the detailed design phase, it is expected that further comments will be received from those having a direct interest in the project, and if necessary, meetings will be convened to discuss stakeholder comments and resolve any remaining issues, where possible.

2.5 Project Notices

2.5.1 Notice of Commencement

The Notice of Commencement was issued as part of Notice of PIC # 1 as described below.

2.5.2 Notice of Public Information Centres (PICs)

Notice of PICs were issued as described below in Table 2-1. Copies of the notices including stakeholder letters were mailed and/or emailed to those on the project mailing list, including review agencies, Indigenous communities, and residents. The notices were also shared on social media and in the local newspaper.

Table 2-1: Notice of Public Information Centre

Notice	Posting/Publication Date/PIC Date
Notice of Commencement and PIC #1	■ The Notice of Commencement and virtual PIC #1 was posted on the website December 2, 2024. ■ The Notice of Commencement and virtual PIC #1 electronic invitation were emailed on December 2, 2024. ■ The in-person PIC #1 notice was posted on the website January 14, 2025. ■ The in-person PIC #1 notice electronic invitation was emailed on January 14, 2025. ■ The in-person PIC #1 newspaper notice was published in the Brampton Guardian the week of January 16, 2025. ■ The in-person PIC #1 was held on January 28, 2025.
Notice of PIC #2	■ Advanced notice and electronic invitation were emailed on May 26, 2025. ■ Reminder email with the notice attached was sent on June 24, 2025, to the project contact list. ■ A newspaper notice was published in the Brampton Guardian on Wednesday, June 11, 2025. ■ Canada Post delivered hard copy mailouts of the notice along the recommended preferred STS route. ■ The notice was uploaded on June 11, 2025 to the Project webpage. ■ The in-person PIC #2 was held on June 25, 2025.
Notice of PIC #3	■ The PIC 3 notice was uploaded on November 27, 2025, to the project webpage and a newspaper version was published in the Brampton Guardian, Caledon Enterprise and Caledon Citizen on November 27, 2025. ■ Advanced notice and electronic invitations were emailed on November 28, 2025. ■ A reminder email with the notice attached was sent on December 10, 2025, to the project contact list. ■ Additionally, on December 4 to 5, 2025, 1,100 hard copy notices were hand-delivered to properties within 120-metres of the potential shaft locations. ■ Letters with the PIC 3 notice were also couriered on December 4, 2025, to 12 property owners whose properties may be directly impacted by the project. ■ The in-person PIC #3 was held on December 11, 2025.
Notice of Completion	■ The Notice was uploaded to the project webpage on November 5, 2026, and a newspaper version was published in the Brampton Guardian, Caledon Enterprise and Caledon Citizen on November 5, 2026. ■ The notice was distributed on November 5, 2026 to the project contact list. ■ Letters with the notice were couriered to 12 property owners whose properties may be directly impacted by the project.

2.5.3 Field Investigation Along the Orangeville-Brampton Railway (OBR)

Notice of limited geotechnical and hydrogeological field investigations was posted to the Project Website on September 12, 2025 and distributed to the project contact list and Peel Region's e-subscriber list. The notice was also hand delivered to 175 properties including those abutting the OBR.

2.5.4 Advance Notice and Pre-Design Field Investigation

Similar to the above, advanced notice for the upcoming Subsurface Utility Engineering and geotechnical/hydrogeological program and pre-design field investigation was issued on October 7, 2025. The notice was distributed to the project contact list and Peel Region's e-subscriber list. The notice was also hand delivered to 1,500 properties. The notice identified where this work is taking place (preferred route road right-of-ways and OBR corridor) and described the investigations and what the community can expect in terms of timing and temporary impacts.

2.5.5 Notice of Completion

The Notice of Completion was issued on November 5, 2026. The Notice of Completion marks the completion of the ESR and initiates the 30-day review period of the ESR. It contains a brief description of the study, a summary of the preferred design alternative, next steps, details on how to view the ESR, dates and timing of the review period, and contact information and procedures for providing feedback on the ESR. As mentioned in Section 1.4.1, the ESR documents the entire planning process undertaken through Phase 1, 2 and 3. Feedback obtained after the 30-day review period and in response to the Notice of Completion will be added to the Final ESR.

A copy of all notices are included in Appendix A4.

2.6 Public Information Centres (PICs)

PICs were used as a primary consultation tool, to provide a platform for information exchange between interested stakeholders and the project team. Three PICs were held during the course of the EA phase as described below.

2.6.1 PIC #1

The purpose of PIC #1 was to introduce the project, present the problem/opportunity statement and preliminary assessment results, the next steps in the study, and gather public feedback on the information presented. Key information presented at the PIC

included study area existing conditions, proposed evaluation criteria and south and north short list sanitary trunk sewer routing options.

PIC #1 was held in two formats, one virtual on December 4, 2024 and one in-person on January 28, 2025. The virtual event consisted of a narrated video published on December 4, 2024 on the project website which included the presentation slides available for download. Interested groups were encouraged to email the project team with any questions or concerns they may have.

The in-person PIC was held at the Paul Palleschi Recreation Centre: 30 Loafers Lake Lane (off of Sandalwood Parkway, west of Kennedy Road) on Thursday, January 28, 2025. The team hosted a dedicated session for developers from 3:00 p.m. to 5:00 p.m., and a session for the general public from 6:00 p.m. to 8:00 p.m. The public meeting information material as well as a copy of the notice was posted on the Region's webpage in advance of the meeting.

Eight representatives from the development community attended the afternoon session. Comments received included a request to extend the EA study area and scope to include servicing of the Hurontario Employment Lands Secondary Plan Area north of Old School Road (refer to PIC # 2 response below). In response to other comments the Region clarified project study area boundary in relation to 2051 urban boundary, how the long list routing options were screened out and the depth of the new sewer will be sufficient to capture flows from future development areas.

Twelve attendees participated in the in-person PIC session. One Comment Sheet was completed at the event and left in the comment box. Additional comments, also from residents, were received following the PIC via email. Comments regarding the southern routes aligned with the view that the railway corridor would meet many of the established criteria while minimizing community disruption. Comments regarding the northern routes were mixed, including one that identified a preference for N1 and another that suggested extending the environmental assessment to encompass nearby employment lands.

Refer to PIC # 1 Summary Report (Appendix A4A) for detailed comments and responses.

2.6.2 PIC #2

The purpose of PIC #2 was to present the evaluation of alternative south and north routes, identify the recommended preferred route and associated preliminary conceptual design (construction methodology), and provide opportunities for the public to provide feedback and ask questions. The Recommended Preferred Route for the Project was posted on Peel Region's (Peel's) Kennedy Road Sanitary Trunk Sewer Project webpage in advance of PIC #2 (May 15, 2025) to allow for public review and comment in advance of the PIC. Both PIC attendees and those unable to attend were

invited to review the Recommended Preferred Route and provide feedback via survey, either in-person or online.

The Recommended Preferred Route details posted on the Project website included:

- A detailed route map, including a description of the route area;
- An overview of the evaluation method, including the evaluation components and comparative criteria;
- Short-list routes of both north and south Project segments, including evaluation criteria and results of each short-list route evaluation; and
- Preliminary route evaluation matrices for both north and south short-listed routes, including specific evaluation criteria.

Website users were also invited to submit questions, comments, or feedback related to the evaluation and the Recommended Preferred Route to the Project team, whose contact information is available on the website.

The in-person PIC was held at the Paul Palleschi Recreation Centre: 30 Loafers Lake Lane (off of Sandalwood Parkway, west of Kennedy Road) on Wednesday, June 25, 2025. Similar to PIC # 1 the team hosted a dedicated session for Developers from 3:00 p.m. to 5:00 p.m., and a session for the general public from 6:00 p.m. to 8:00 p.m. The public meeting information material as well as a copy of the notice was posted on the Region's webpage in advance of the meeting.

PIC #2 was held in an open house format with materials available to both developers and the public to facilitate discussions. Project team members were available to speak one-on-one with attendees, collecting feedback and answering questions. The public meeting information material as well as a copy of the notice was posted on Peel's Project webpage in advance of the meeting.

PIC #2 included the following materials:

- 21 display boards;
- Aerial map of the Recommended Preferred Route;
- Maps showing preliminary profile of the sewer, along with proposed shaft locations;
- Maps of 2025 Wastewater Development Charges and 2025 Water Development Charges;
- Survey;
- Land Acknowledgement print-out;
- Flow | Central Brampton Factsheet;
- Sign-in form; and
- Printed copies of display boards.

The Project webpage was updated following the event with copies of the display boards and online survey.

An online survey was available from June 25, 2025, to July 9, 2025, to collect feedback on the Recommended Preferred Route and other key themes presented at the PIC.

The PIC #2 display boards included:

- An overview of the Project, including a section describing the function of a sanitary trunk sewer;
- A map and description of the Project study area;
- The MCEA Schedule C process and phases;
- Feedback and work completed to-date;
- Upcoming Project work, including alternative solutions;
- Shortlisted north and south routes;
- Route evaluation criteria;
- An overview of recommended preferred routes, both north and south, and the final Recommended Preferred Route;
- Overview of Phase 3 of the EA Process: Alternative design concepts;
- Preliminary evaluation of construction methods;
- A map of potential shaft locations;
- Approach to construction impact management;
- The Project phases, including progress, where we are now, and next steps; and
- Project contact details, webpage link: https://peelregion.ca/construction/environmental-assessments/kennedy-road-sanitary-trunk-sewer-project and Program website.

At the PIC, these boards were displayed around the room and were available as printed copies. Following the PIC, the boards were posted on the Project webpage.

Eight attendees participated in the first drop-in session, from 3:00 p.m. to 5:00 p.m., open to developers. Feedback highlighted need to include servicing of the Hurontario Employment Secondary Plan Area within the current EA process. The Region accordingly noted that the Kennedy Road project timeline is extremely compressed and the servicing of the Hurontario Employment Secondary Plan Area is being accelerated through the Flow South Caledon Water and Wastewater Servicing Program. Other comments included concerns related to changes to Peel Region development charges and a question about how the construction of this infrastructure is being funded as well as the study area coverage under the traffic impact assessment.

Sixteen members of the public attended the general public portion of the PIC from 6:00 p.m. to 8:00 p.m. Discussions and questions were generally positive with one resident raising concerns relating to shaft compound construction including noise and vibration and access to existing trails.

Refer to PIC # 2 Summary Report (Appendix A4B) for detailed comments and responses.

2.6.3 PIC #3

In-person PIC # 3 was held at the Paul Palleschi Recreation Centre: 30 Loafers Lake Lane (off of Sandalwood Parkway, west of Kennedy Road) on Thursday, December 11, 2025. Similar to PIC #1 and PIC # 2 a dedicated session for Developers was held from 3:00 p.m. to 5:00 p.m., and a session for the general public was held from 6:00 p.m. to 8:00 p.m. The public meeting information material as well as a copy of the notice was posted on the Region's webpage.

PIC #3 was held in an open house format with materials available to both developers and the public to facilitate discussions. Display boards were set-up around the room and were available as printed copies. Project team members were available to speak one-on-one with attendees, collecting feedback and answering questions. The PIC materials and a copy of the notice was posted on Peel's project webpage in advance of the meeting.

PIC 3 included the following materials:

- 20 display boards;
- Maps showing plans and profiles of pipe alignments and proposed shaft locations,
- Survey;
- Land acknowledgement;
- Flow | Central Brampton and project factsheet;
- Sign-in form;
- Examples of similar-scale shaft compound construction (shown on the projector);
- Flow | Central Brampton postcards; and
- Printed copies of display boards.

The project webpage was updated prior to the in-person event with accessible copies of the display boards and the online survey.

The PIC #3 display boards included:

- An overview of the project, including a map of the Study Area;
- An overview of the importance of wastewater management, how sanitary and storm sewers work, as well as definitions of a shaft and shaft compound;
- The Municipal Class EA planning process;
- Feedback received and work completed since PIC #2;
- Construction methods – tunnel boring machine (TBM) compared to micro-tunnelling (MTBM), as well as definitions for open-cut and trenchless methods;
- Overview of Phase 3 of the EA Process, including the recommended preferred route;
- Maps of proposed MTBM and TBM concepts along the route alignment;
- Construction methodology evaluation results comparing TMB and MTBM for three segments;
- MTBM shaft compound maps for segments 1, 2 and 3, including key factors for selection and community impacts;
- The project timelines, including progress to date and next steps;
- Details on how construction impacts will be managed; and
- Project contact details, survey link and project webpage.

Program and Project Delivery team members engaged in extensive discussions with developers. These conversations provided a valuable opportunity to continue meaningful dialogue about the project's implementation considering future development status in the area including draft plan approval and timing of construction which lead to refinement of the proposed location for the shaft compound at Old School Road and Hurontario Street.

Feedback from the public session included one respondent's concern that pedestrians and cyclists will be unable to use the OBR Corridor during construction, and another respondent questioned whether pedestrians can access both sides of Kennedy Road where there is a long distance between crossing points. No concerns were expressed about the evaluation of construction methods.

Refer to PIC #3 Summary Report (Appendix A4C) for detailed comments and responses.

3. Phase 1: Study Area Profile, Policy Context, Problem and Opportunity Statement

3.1 Background Review

The following summarizes the key findings of the background review of previous studies and their applicability to this current study.

3.1.1 Water and Wastewater Master Plan for Lake-Based Systems, 2020 and 2026 Update

Peel Region 2020 Water and Wastewater Master Plan for the Lake-Based Systems documents the preferred wastewater servicing strategy and provides detailed information on proposed capital works to be implemented over the twenty-year planning horizon.

As a result of Bill 23, Peel Region is anticipating significant population growth and accelerated timing of this growth, resulting in increased demand on water and wastewater services. To meet the planned growth, it is critical to continue developing capacity and system redundancy in Peel's lake-based water and wastewater systems. As a result, Peel Region will be updating its 2020 Water and Wastewater Master Plan to support existing servicing needs and future growth from the planning year from 2041 to 2051 to accommodate the accelerated growth in Mississauga, Brampton, and parts of Caledon.

The Master Plan update is anticipated to be completed in 2026 and will:

- Align with the latest approved population and employment forecasts to 2051. The result of Bill 23 has accelerated the population and employment forecasts from 2041 to 2051.
- Consider the accelerated growth implications of the Province's Bill 23.
- Include collaboration with local municipalities to identify priority growth areas such as major transit station areas
- Assess potential growth beyond the 2051 planning horizon for long-term infrastructure planning purposes.

The study is following the Municipal Engineers Association Class Environmental Assessment Master Planning, Approach 1 process as outlined below:

- Satisfy Phases 1 and 2 of the MCEA process, including developing and evaluating alternative servicing strategies, routes, and sites.
- Consider public and stakeholder input throughout the process.
- Conclude with a Master Servicing Plan Report that will be filed for public review.

Relevance to this study: The Kennedy Road Sanitary Trunk Sewer was not captured in the 2020 Master Plan until after the release of the Province of Ontario's Bill 23 which requires accelerated growth in the Study Area. The Kennedy Road Sanitary Trunk Sewer was identified by Peel Region as a key project to allow increased wastewater service capacity in downtown Brampton.

3.1.2 Central Caledon Servicing Study

Peel Region is also completing a water and wastewater servicing study for Central Caledon that identifies options for water distribution and wastewater conveyance from Old School Road southerly to Bovaird Drive. This servicing study addresses planned growth to 2051 (capturing assigned Provincial housing targets) and covers the northern part of the Kennedy Road Sanitary Trunk Sewer Schedule C MCEA Study Area.

Relevance to this study: The wastewater recommendations from the Central Caledon Servicing Study has been considered in the Region's wastewater model which informed the sizing of the Kennedy Road Sanitary Trunk Sewer and associated branches. This study also helped inform the 2026 Water and Wastewater Master Plan strategy.

3.2 Baseline Population Data

The baseline population data for the model was extracted from current InfoWorks ICM wastewater hydraulic model received from Peel Region (*Peel_MergedModel_31July2024_v2021_9.icmt*). There are three scenarios in the InfoWorks model: base conditions (existing population), 2051 population, and ultimate population.

Table 3-1 below shows the population in the hydraulic model for the Study Area (refer to **Figure 1-1** for study area map).

Table 3-1: Study Area Population (North of Queen Street)

Scenario	Serviced Population Fletchers Creek Sanitary Trunk Sewer	Serviced Population Etobicoke Creek Sanitary Trunk Sewer	Total
Existing Conditions	93,589	127,407	220,996
2051 Growth	63,649	46,471	110,120
Total	**157,238**	**173,878**	**331,116**

The Hydraulic Modelling Technical Memo is provided in Appendix B.

3.3 Growth Commitments

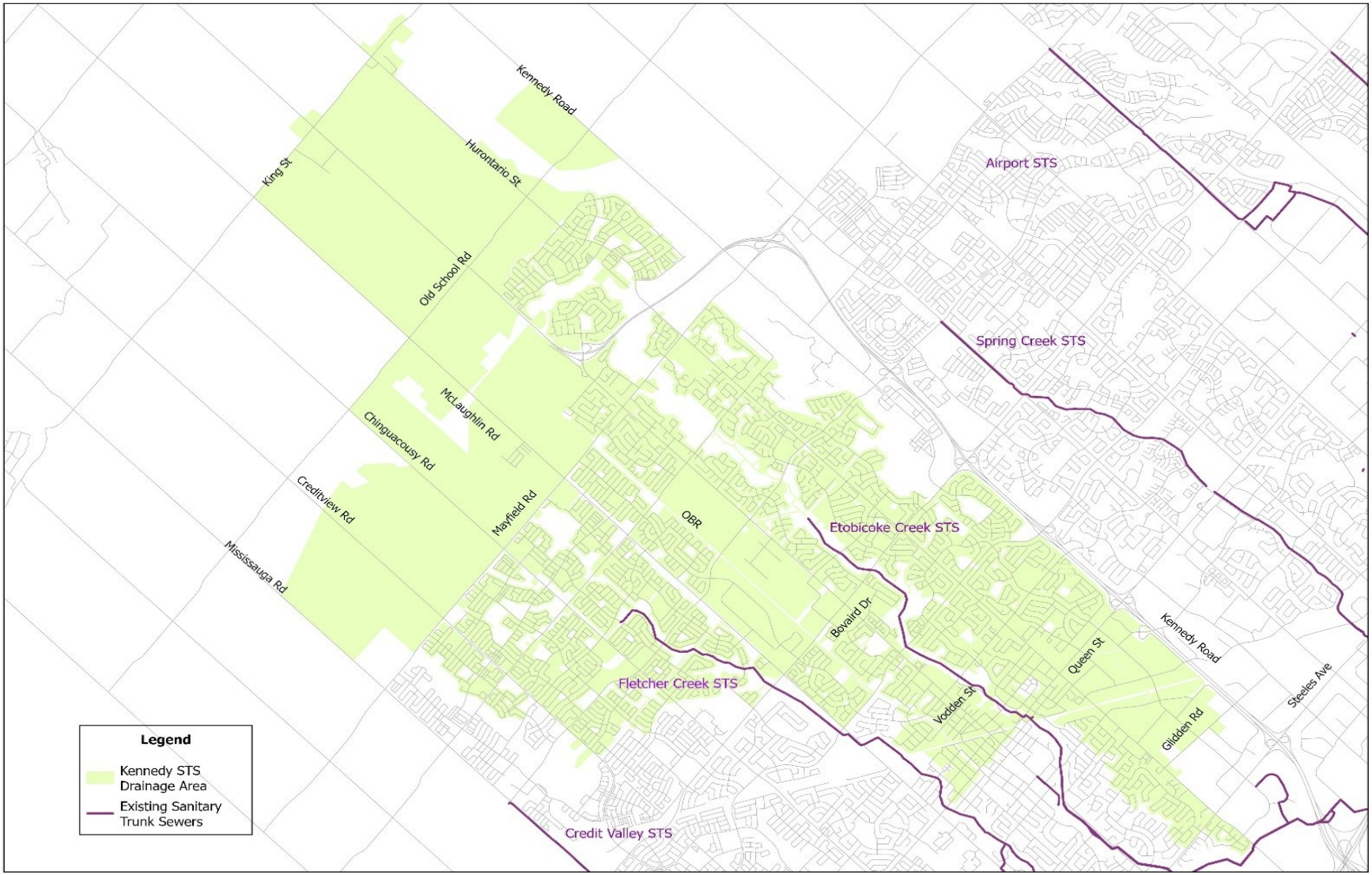
The population serviced in the area of the proposed Kennedy Road STS can best be understood by grouping parcels into sanitary catchment areas serviced by various branches of the sanitary collection system. The proposed Kennedy Road STS drainage areas and connection points are shown in Table 3-2 and Table 3-1.

Table 3-2 also indicated the existing population densities for each proposed connection point within the study area. Table 3-2 is based on the Region's existing population projection layer (SGU Scenario 2).

Table 3-2: Proposed Population Serviced by Kennedy Road Sanitary Trunk Sewer by Proposed Connection Point (Excluding Queen Street and Bovaird Drive branches)

Location of Proposed Connection Points	Old School Road / Hurontario Street	Dougall Sanitary Pumping Station	Future Street A	Fletchers Creek / Bovaird Drive East	Etobicoke Creek West / Bovaird Drive East	Vodden Rd	Church Street / Kennedy Road	Queen Street / Kennedy Road	Glidden Road / Kennedy Road
Existing Population	-	1,377.92	TBD	48,607.01	17,493.73	99,578.43	8,957.56	21,767.91	17,647.82
2051 Growth	40,904.23	962.61	TBD	56,736.95	8,468.72	28,419.85	8,607.19	18,145.87	7,275.90
Total Equivalent Population	40,904.23	2,340.53	TBD	105,343.96	25,962.45	127,998.28	17,564.75	39,913.78	24,923.72

Figure 3-1: Proposed Kennedy Road Sanitary Trunk Sewer Drainage Area



3.4 Land Use Planning Projections

The Region has two growth scenarios developed for the use in the 2026 Water and Wastewater Master Plan Update (to be completed 2026). The two scenarios, Scenario 1 and Scenario 2, are representing an approved growth projection by the Regional Council and accelerated growth in the system, respectively. For determining the size of the proposed Kennedy Sanitary Trunk Sewer, Scenario 2 growth projection was used to achieve the appropriate size that can meet the population projection within the planning horizon and beyond. For this project stage, the project team used the Scenario 2 population information as noted in Section 3.3 and used in Peel Region's Wastewater Hydraulic Model (InfoWorks ICM).

3.5 Policy Context

3.5.1 Bill 23 – More Homes Built Faster Act, 2022

The province introduced Bill 23 "More Homes Built Faster Act" in October 2022 which received Royal Assent November 28, 2022. Bill 23 and the province's subsequent housing targets have significantly accelerated the demands on housing enabling infrastructure, at rates of almost two and a half times that of the previously planned growth for the same period as identified in approved Peel Region and area municipality official plans, and five times that of historical growth. In response, the Region, in association with the City of Mississauga, City of Brampton and Town of Caledon have updated their population projections to align with the province's housing targets.

Relevance to this study: This provincial directive accelerates the need for increased sanitary trunk sewer conveyance capacity which also supports the MCEA Phase 1 Problem and Opportunity Statement. This study has taken into consideration the updated planning projections to ensure adequate sizing of the proposed Kennedy Road Sanitary Trunk Sewer.

3.5.2 Bill 185 – Cutting Red Tape to Build More Homes Act, 2024

Bill 185, the Cutting Red Tape to Build More Homes Act, 2024, received Royal Assent on June 6, 2024. Bill 185 proposes amendments to a total of 15 provincial Acts.

Among the planning legislation changes is removing the planning responsibilities for several upper-tier municipalities and Conservation Authorities. This includes Peel Region as of July 1, 2024, whereby Peel Region would no longer have approval authority over their lower-tier municipalities' planning decisions. The Province will now become the approval authority, where required, and the local municipalities will be required to

implement and ensure planning applications conform to Peel Region's Official Plan. The enactment of Bill 185 further confirms Peel Region will not be dissolved.

Relevance to this study: Short list sanitary trunk routing options has considered conformity with the City of Brampton and Town of Caledon Official Plans.

3.5.3 Provincial Policy Statement

The 2024 Provincial Policy Statement comes into effect on October 20, 2024, and will replace the previous Provincial Policy Statement (2020) and A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020). The 2024 Provincial Policy Statement provides streamlined single document with provincial policy direction on matters related to land use planning and development that affect communities, such as ensuring the appropriate infrastructure is planned or available to accommodate current and future needs.

Relevance to this study: The key chapters and associated sections of policies that have been considered includes:

- Chapter 3: Infrastructure and Facilities:
  - 3.1 General Policies for Infrastructure and Public Service Facilities
  - 3.6 Sewage, Water and Stormwater
- Chapter 4: Wise Use and Management of Resources
  - 4.1 Natural Heritage
  - 4.6 Cultural Heritage and Archaeology
- Chapter 5: Protecting Public Health and Safety
  - 5.1 General Policies for Natural and Human-Made Hazards
  - 5.2 Natural Hazards
- Chapter 6: Implementation and Interpretation
  - 6.2 Coordination

In reference to Chapter 3 as noted above, Policy 3.6.1 provides that "Planning for sewage and water services shall:

- Accommodate forecasted growth in a timely manner that promotes the efficient use and optimization of existing municipal sewage services and municipal water services and existing private communal sewage services and private communal water services;

- Ensure that these services are provided in a manner that:
  - Can be sustained by the water resources upon which such services remain feasible and financially viable over their life cycle; Protects human health and safety, and the natural environment, including the quality and quantity of water; and
  - Aligns with comprehensive municipal planning for these services, where applicable.
- Promote water and energy conservation and efficiency;
- Integrate servicing and land use considerations at all stages of the planning process;
- Consider opportunities to allocate, and re-allocate if necessary, the unused system capacity of municipal water services and municipal sewage services to support efficient use of these services to meet current and projected needs for increased housing supply; and
- Be in accordance with the servicing options outlined through policies 3.6.2, 3.6.3, 3.6.4 and 3.6.5."

Pursuant to Policy 3.6.1, this study is consistent with the Provincial Policy Statement through accommodating forecasted growth in a timely manner promoting optimization of existing municipal sewage services and integrating servicing and land use considerations. This study will consider feasible alternatives for a new Peel Region Kennedy Road Sanitary Trunk Sewer with sizing that will meet the current and projected servicing needs for increased housing supply as per the Region's growth management commitments and land us planning projections.

This study is consistent with the Provincial Policy Statement through the implementation of a coordinated, integrated and comprehensive approach to dealing with infrastructure in accordance with Policy 6.2.

The proposed short list of routes for the future Peel Region Kennedy Road Sanitary Trunk Sewer will consider natural heritage features and areas and shall be consistent with Policy 4.1.

Policy 4.6 is relevant as Peel Region will ensure that Indigenous communities and their interests are considered when identifying, protecting and managing archaeological resources, built heritage resources and cultural heritage landscapes. Indigenous communities were circulated a pre notification letter to introduce the Project and will be circulated all MCEA notices (i.e., Notice of Commencement and PIC #1, Notice of PIC #2, Notice of PIC #3, and Notice of Completion. Indigenous communities were also be notified of the ecological investigations and any other relevant field investigations and participated in field investigations. The Natural Environment Report and Stage 1

archaeological assessment and cultural heritage reports were also be shared. Indigenous communities will also be invited to participate in future Stage 2 AA field work.

3.5.4 City of Brampton Official Plan

The City of Brampton Official Plan (Office Consolidation August 1, 2024) guides how the City will grow and develop to 2051, including policy framework to address transportation, housing, culture and heritage, the environment, and the economy. The following Brampton Official Plan Schedules (refer to **Appendix F2**) apply to the Kennedy Road Sanitary Trunk Sewer MCEA:

- Schedule 1A City Structure
- Schedule 2 of the Official Plan, the Land Use Designations for the Study Area includes:
  - **Mixed-use Areas** – Mixed use development is the development of land or a building with two or more different uses, such as residential, office and retail. Mixed-use can occur vertically within a building, or horizontally on a site.
  - **Neighborhoods**: Throughout the Study Area include Snelgrove-Heart Lake, Downtown Brampton, Queen Street Corridor and Brampton Flowertown.
  - **Employment Areas**: Means those areas designated in an official plan for clusters of business and economic activities including, but not limited to, manufacturing, warehousing, offices, and associated retail and ancillary facilities.
  - **Mixed-use Employment Areas:** Can be discerned by combining the Cities definitions of Employment Area with Mixed-use Area.
  - **Natural Heritage Features and Area:** Are identified as features and areas, including significant wetlands, significant coastal wetlands, other coastal wetlands in Ecoregions 5E, 6E and 7E, habitat of endangered and threatened species, fish habitat, wetlands, significant wildlife habitat (including habitat or special concern species), and significant areas of natural and scientific interest, which are important for their environmental and social values as a legacy of the natural landscape of an area.

Relevance to this study: The Study Area is primarily situated in the City of Brampton. Policy 5.7.3 provides that "Development is to progress in a financially responsible and environmentally sustainable manner and cannot proceed until infrastructure, such as water, wastewater, transportation and community regional services are available." The

City of Brampton Official Plan including schedules were reviewed and considered in the evaluation of Sanitary Trunk Sewer short list routing options, where applicable.

3.5.5 Town of Caledon Official Plan

The Town of Caledon Official Plan (March, 2024 Consolidation) provides a framework of policies on how lands should be used and growth should be managed over the long term. This also includes plans for forecasted population and employment growth to the year 2031. The following Town Official Plan Schedules (refer to **Appendix F2**) apply to the Kennedy Road Sanitary Trunk Sewer MCEA:

- Schedule A Land Use Plan
- The Town of Caledon is planning to develop the land north of Mayfield Road and West of the Highway 410. This will create a new neighbourhood in the area that has been titled Mayfield West. Land use plans associated with the new development can be found in Schedules B, B1 and B2 of the Caledon Official Plan. The new Sanitary Trunk Sewer will be required to service this area toward its northern most reaches. This proposed development will join the communities southern most residential areas of Caledon and with the northern areas of Brampton including Snelgrove-Heartlake.

Relevance to this study: The Town of Caledon Official Plan including schedules were reviewed and considered in the evaluation of Sanitary Trunk Sewer short list routing options, where applicable.

3.5.6 Credit Valley Conservation

CVC, among other roles and responsibilities in the land use planning and development process, administers Ontario Regulation 41/24 "Prohibited Activities, Exemptions, and Permits" to ensure the protection of life and property from natural hazards such as flooding, erosion, dynamic beaches or unstable soil or bedrock.

Relevance to this study: The western portion of the Study Area is situated within the CVC jurisdictional limits. A permit under Ontario Regulation 41/24 "Prohibited Activities, Exemptions, and Permits" has been confirmed based on the preliminary preferred sanitary trunk sewer alignment that falls within CVC regulated watercourses. Consultation with CVC occurred through out the MCEA planning process and will continue through the post-MCEA design and permitting process.

3.5.7 TRCA

The TRCA, among other roles and responsibilities in the land use planning and development process, administers Ontario Regulation 41/24 "Prohibited Activities,

Exemptions, and Permits" to ensure the protection of life and property from natural hazards such as flooding, erosion, dynamic beaches or unstable soil or bedrock.

Relevance to this study: The eastern portion of the Study Area is situated within the TRCA jurisdictional limits. A permit under Ontario Regulation 41/24 "Prohibited Activities, Exemptions, and Permits" will be required and will be confirmed based on the preliminary preferred sanitary trunk sewer alignment that falls within TRCA regulated watercourses. Consultation with TRCA occurred through out the MCEA planning process and will continue through the post-EA design and permitting process.

3.5.8 Source Water Protection

To protect drinking water sources, surface water intakes and wellheads in source protection areas have been identified as vulnerable areas as per the Clean Water Act, 2006 and as amended. Projects proposed within a Source Water Protection vulnerable area are required to consider policies in the applicable Source Protection Plan, including their impact with respect to the Project. A watershed-based Source Protection Plan contains policies to reduce existing and future threats to drinking water in order to safeguard human health through addressing activities that have the potential to impact municipal drinking water systems. The Credit Valley, Toronto and Region and Central Lake Ontario Source Protection Plan applies to three Source Protection Areas: Credit Valley, Toronto and Region and Central Lake Ontario.

There are four types of vulnerable areas identified within the Plan:

- Wellhead Protection Areas (WPAs) – WPAs are areas of land around a municipal well where land use activities have the greatest potential to affect the quality of water flowing into the well.
- Intake Protection Zones (IPZ) – An IPZ is the area around a surface body of water where water is drawn in and conveyed for municipal drinking water
- Highly Vulnerable Aquifers (HVA) – Aquifers are underground layers of water that supply wells. HVAs are susceptible to contamination due to their proximity to the ground surface or where the types of materials in the ground around it are highly permeable.
- Significant Groundwater Recharge Areas (SGRAs) – SGRAs are characterized as having porous soils (e.g., sand or gravel), which allow for water to easily seep into the ground and flow to an aquifer.

Relevance to this study: The Study Area only includes HVAs. Impacts to HVAs will be considered and addressed through the detailed design and permitting and approvals process.

3.6 Problem and Opportunity Statement

Phase 1 of the five-phase MCEA planning process requires the proponent of an undertaking (i.e., Peel Region) to first document factors leading to the conclusion that the improvement is needed, and to develop a clear statement of the identified problems or opportunities to be addressed. As such, the problem or opportunity statement is the main starting point in the undertaking of a MCEA and becomes the central theme and integrating element of the Project. It also assists in setting the scope of a MCEA study.

The following problem or opportunity statement has been developed for this MCEA study:

Problem and Opportunity Statement

To support growth through 2051, Peel Region must increase the capacity of key sanitary trunk sewers serving Central Brampton and the Town of Caledon. Currently, wastewater conveyance capacity in these areas is insufficient to meet future demands, requiring upgrades by 2030 to align with Provincial housing targets. The Kennedy Road Sanitary Trunk Sewer Schedule C MCEA study will help address this need by facilitating stakeholder consultations—including review agencies, Indigenous communities, and the public—to guide the selection of an optimal solution and associated design concept. Additionally, the study enables coordination with other infrastructure projects, improving efficiencies and informing Peel Region's 2026 Water and Wastewater Master Plan Update.

4. Phase 1: Baseline Conditions

4.1 Physical Environment

4.1.1 Former Orangeville Brampton Railway (OBR) Environmental Site Assessment

The Region of Peel retained WSP Canada Inc. to complete a Limited Phase II Environmental Site Assessment (ESA) of the former OBR corridor, extending approximately 55 kilometres from the City of Mississauga through the City of Brampton to the Town of Caledon (Appendix C1). The assessment was undertaken for due diligence prior to a potential property transaction and evaluated soil and groundwater conditions in accordance with Ontario Regulation 153/04 and the MECP 2011 Soil, Ground Water and Sediment Standards. A Record of Site Condition (RSC) is not required for the planned rail-to-trail conversion due to the change-of-use exemption under O. Reg. 153/04.

WSP advanced 45 boreholes and installed 18 groundwater monitoring wells to investigate 40 targeted Areas of Potential Environmental Concern (APECs) identified in the 2020 Contaminant Overview Study (Appendix C3). Soil and groundwater were analyzed for metals, petroleum hydrocarbons (PHCs), Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), Polycyclic Aromatic Hydrocarbons (PAHs), Volatile Organic Compounds (VOCs), Polychlorinated Biphenyls (PCBs), and Organochlorine Pesticides (OCPs).

The majority of the corridor met MECP standards, with impacts confined to discrete hotspots. Most organic compounds (PHCs, VOCs, PCBs, OCPs) were non-detect or below criteria, and laboratory Quality Assurance/Quality Control (QA/QC) results confirmed that findings were valid, with minor variability attributed to natural heterogeneity or sediment influence.

In the City of Brampton Segment of the corridor, localized exceedances were identified in:

- Soil: PAHs (three locations), metals (two locations), and PHCs/BTEX at depth (one location).
- Groundwater: cobalt, chromium, molybdenum, and initial PAH detections (the latter considered sediment-related and not representative).
  While the risk of off-site migration is low for chromium and molybdenum, it is elevated for cobalt; further evaluation is warranted.

In the Town of Caledon Segment of the corridor, localized exceedances were identified in:

- Soil samples for metals/mercury (four locations), PAHs (two locations) and PHCs/BTEX (two locations).
- Groundwater also showed exceedances for several metals at select locations. Some impacts may require remediation in addition to risk assessment.

Overall recommendations were as follows:

- Due Diligence Risk Assessment (DDRA) was recommended for all exceedances in Brampton and Caledon.
- Caledon hotspots (BH21-10, BH21-41, BH21-36) may require further delineation and potential soil excavation with confirmatory testing.
- Groundwater Management:
  - Continue monitoring where needed.
  - Decommission monitoring wells once wells are no longer required, in accordance with O. Reg. 903.
- Ongoing Compliance: Reassess risk if land use plans evolve during the Rail-to-Trail conversion.

4.1.2 Desktop Studies on Geotechnical and Contamination

4.1.2.1 Desktop Geotechnical Study Report

EnVision Consultants Ltd. (EnVision) was retained by the Region to undertake a Desktop Geotechnical Study in the Study Area (Appendix C2). The purpose of this desktop study was to review the geotechnical conditions along the Study Area based on existing published information and available data reports. This desktop study report should be read in conjunction with EnVision's Contaminant Overview Study (Appendix C3).

Physiographic Setting

Chapman and Putnam (2007) indicates that the Study Area lies within the physiographic regions known as the South Slope at the northern portion of the Study Area (OBR, Old School Road, Bovaird Drive) and the Peel Plain (Vodden Street, Kennedy Road and Queen Street) at the southern portion of the Study Area. The South Slope region extends from Niagara Escarpment to the Trent River which gently slopes downwards towards Lake Ontario. The upper overburden consists of lacustrine clay, moraine till and isolated silt and sand deposits, underlain by shale bedrock throughout this region. The Peel Plain characterized as an area of relatively low relief that features fine grained till underlain by Ordovician shale bedrock.

Regional Geology

According to the Ontario Geological Survey mapping the Study Area is dominated by glaciolacustrine-derived silty to clayey glacial till. This type of till is formed from sediments deposited in glacial lakes, often exhibiting a range of grain sizes from silt to clay. The presence of this till suggests the historical influence of glacial processes and subsequent lacustrine deposition within the study area. Modern alluvium has been deposited within the broad Etobicoke Creek floodplain, flanking Site area, which flows from the northwest to the southeast. Modern alluvium deposits are sedimentary accumulations actively deposited by fluvial processes within river channels, floodplains, and deltas. Composed of varying proportions of sands, silts, clays, gravels, cobbles and organic matter, these deposits reflect ongoing erosion upstream and the transport dynamics of rivers. They form through the continuous cycle of sediment erosion, transportation, and deposition, influenced by seasonal fluctuations in river discharge and interactions with slower-moving water bodies.

According to the Ontario Geological Survey mapping (Armstrong, 2007), the bedrock at the Study Area is predominantly shale interbedded with limestone and siltstone of the Queenston Formation. The Queenston Formation is a red-brown mudstone to shale, interbedded with thin layers of limy, greenish-blue siltstone and limestone. The Queenston often lacks the fissility of a shale. The mudstone is typically a weak to medium strong rock (unconfined compressive strength of 5 to 50 MPa) under the International Society for Rock Mechanics strength convention, occasionally strong (50 to 100 MPa).

Groundwater Well Database

Regional groundwater flow moves from the northwest to the southeast towards Lake Ontario. Shallow groundwater flow is influenced by local topography, with recharge occurring in the upland areas and at the CN Rail crossing, and discharge occurring within the low-lying area of Etobicoke Creek. Based on a review of the MECP water well database, over 450 water well records were identified within an approximately 250 metre radius of the Study Area, with water levels reported varying as listed in **Table 4-1** below.

Table 4-1: Summary of Groundwater Levels

Study Area	Groundwater Level (mbgs) reported in MECP Water Well Database
Kennedy Road	0.9 metres to 26.5 metres
Queen Street	1.5 metres to 6.7 metres
Vodden Street	1.5 metres to 14.6 metres
OBR	0.1 metres to 54.9 metres
Bovaird Drive	4.3 metres to 12.2 metres
Old School Road	3.5 metres to 53.6 metres

For more information about the subsurface conditions, and study recommendations for site investigation, refer to the Desktop Geotechnical Study which is included in Appendix C2.

4.1.2.2 Contamination Overview Study

The Contaminants Overview Study (Appendix C3) pinpointed numerous *Potential Contaminating Activities* (PCAs) and *Areas of Potential Environmental Concern* (APECs) – including autobody shops, vehicle-service facilities, and gasoline stations – situated along the Kennedy Road corridor.

Soil samples collected during WSP's Phase 2 Environmental Site Assessment (ESA) of the OBR segment (Vodden Street to Bovaird Drive) exceeded MECP's Table 1 Site Condition Standards for several constituents, most notably polycyclic aromatic hydrocarbons (PAHs) and petroleum hydrocarbons (PHCs). Because these exceedances apply to the planned shaft compounds, additional scrutiny via a DDRA is required and could present challenges at those sites. Known risks of soil and groundwater contamination at the shaft and compound areas can be addressed through targeted soil-management and stormwater-control measures. A focused DDRA for the shaft compounds will be necessary to refine and confirm these mitigation strategies during the detailed design stage.

4.2 Natural Environment

A preliminary desktop review was completed to gather background data on the terrestrial and aquatic habitat in the Study Area. The information was obtained through a review of secondary source materials including the City of Brampton Official Plan (2024a), City of Brampton Open Data (2024b), the Peel Region Official Plan (2022), The Town of Caledon Official Plan (2024), the TRCA Open Data (2024), CVC Authority Open Data (2024), the Ministry of Natural Resources Natural Heritage Information Centre database (Ministry of Natural Resources, 2024a) and Aquatic Resources Area database (Ministry of Natural Resources, 2024b), Ontario Breeding Bird Atlas (Bird Studies Canada, 2006), Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019), Ontario Butterfly Atlas (Toronto Entomologists' Association, 2024), Ebird (2024), iNaturalist (2024), Fisheries and Oceans Canada Species at Risk mapping (Department of Fisheries Ontario, 2024), and Ministry of Environment, Conservation and Parks species range maps (MECP, 2019).

A review of these secondary source materials identified 35 Species At Risk and 99 Species of Conservation Concern with ranges that potentially overlap the Study Area. Provincial Species At Risk are defined as species that are listed as either Threatened, Endangered or Extirpated under the Species Conservation Act (2025). Federal Species at Risk are those species listed as Threatened, Endangered or

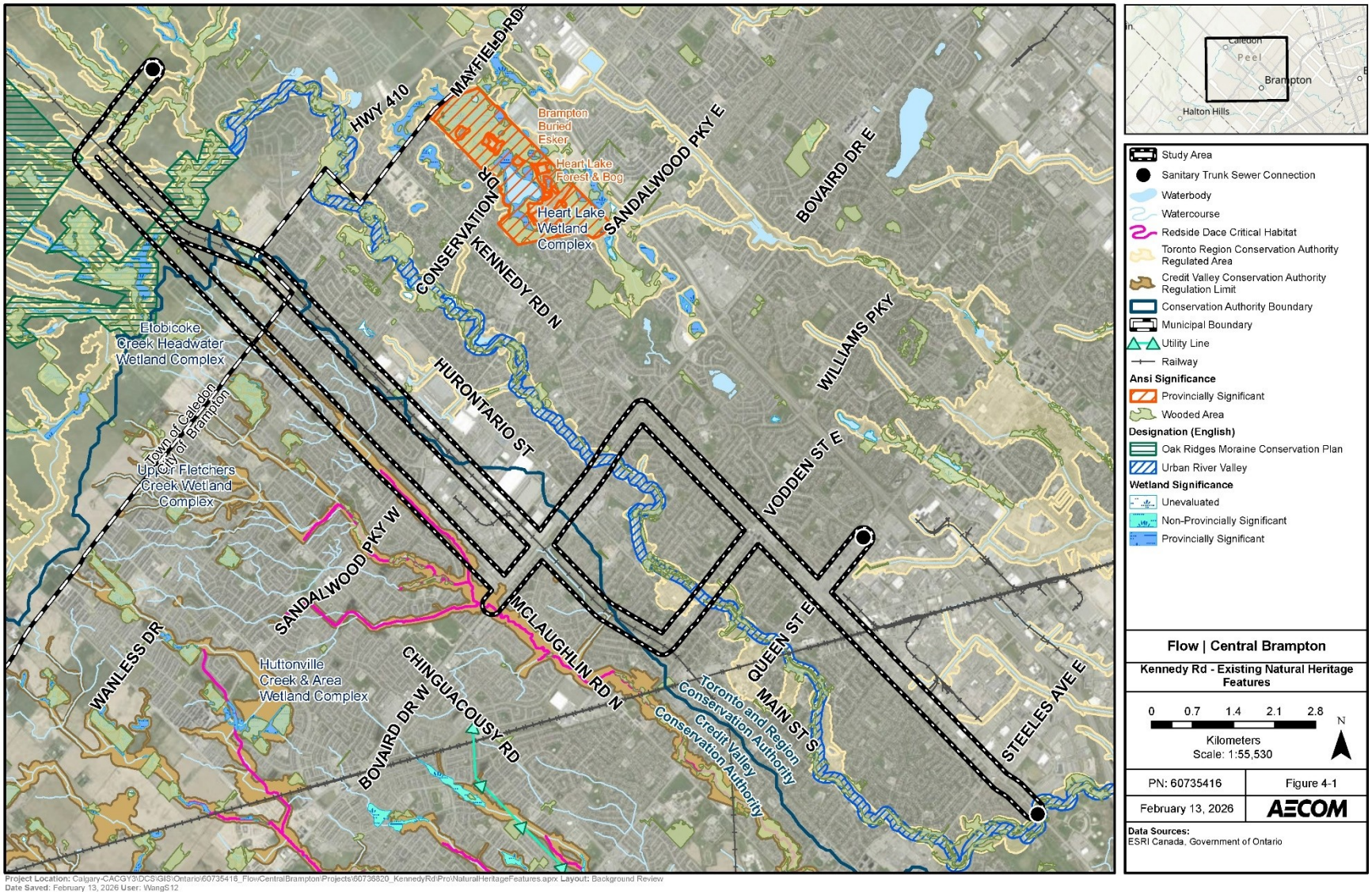
extirpated under Schedule 1 of the Species Conservation Act (2025). Species of Conservation Concern include all Special Concern species under the Endangered Species Act (2007) and Provincially Rare (S1-S3, SH) plant and animal species.

According to City of Brampton Official Plan and City of Caledon Official Plan the Natural Heritage System is comprised of wetlands, habitat of Endangered and Threatened species, fish habitat, Area of Natural and Scientific Interest, significant woodlands, significant valley lands, significant wildlife habitat, and sand barrens, savannahs, and tall grass prairies. An initial review of the Toronto Region Conservation Authority, CVC, and Brampton Open Data show that there are evaluated provincially significant wetlands, as well as provincially policy areas such as the Greenbelt Protected Countryside and Urban River Valleys on both public and private land along the proposed alternative routes.

Review of the Natural Heritage Information Centre Make a Map feature indicates the Study Area includes evaluated and unevaluated wetland, woodlands, and Natural Heritage System. There are no Areas of Natural and Scientific Interest within the Study Areas along all routes proposed. The closest Area of Natural and Scientific Interest, the Brampton Buried Esker and Heart Lake Forest and Bog, which are regionally significant, and are located approximately 200 metres away from the Study Area. Portions of the Study Area fall within the Heart Lake Wetland complex and Etobicoke Creek Headwater both of which have been evaluated as a Provincially Significant Wetlands (Figure 4-1). The Natural Heritage System extends into the northern portion of the Study Area, within the Greenbelt Plan Area. The Study Area falls into the Etobicoke Creek (TRCA) and Mary Fix Creek (CVC) quaternary watersheds. Etobicoke Creek, including its headwaters, Spring Creek tributary, and West Branch sub-watersheds, runs through the Study Area within the Greenbelt Area Boundary and is designated as an Urban River Valley under the Greenbelt Plan. Fish-bearing waterbodies present in the study are Heart Lake, Etobicoke Creek, and Fletchers Creek. The Department of Fisheries Ontario Species At Risk mapping indicates the presence of Redside Dace (*Clinostomus elongatus*) in the Fletchers Creek watershed (Department of Fisheries Ontario, 2024).

A more detailed review of the background information and data collected from the windshield confirmation investigation (held on October 2, 2024) was used to inform the short list of alternatives evaluation as part of the MCEA planning process. A windshield investigation confirmed the existing conditions. More detailed field investigations were completed for the short-listed alternatives in early spring through summer 2025, during the appropriate timing windows. The Natural Environment Report is provided in Appendix D.

Figure 4-1: Existing Conditions – Natural Environment



4.3 Fluvial Geomorphology

As part of the baseline natural features assessment, a bed scour assessment has been undertaken for watercourse crossings to assess appropriate trunk sewer burial depths. The alternative north and south short-listed routes were assessed in the field at the watercourse and, as part of the scour assessment, which included detailed channel cross-sections and longitudinal profiles through survey data.

In addition, lateral scour was assessed through the completion of a meander belt and 100-erosion rate assessment. Field investigations also consisted of a geomorphic reconnaissance identifying fluvial geomorphological features, issues, constraints, and opportunities, in addition to a rapid geomorphic assessment to assess reach stability. Findings were used to characterize the watercourses with respect to geomorphological conditions, stability, existing issues, future stability, and any existing erosion or sedimentation concerns. This geomorphological understanding is vital to determine the potential scour depth and lateral movement of the watercourse over the lifespan of the sanitary sewer. A summary of the fluvial geomorphic results is provided in Appendix E.

4.4 Socio-Economic Environments

4.4.1 City of Brampton

The City of Brampton is located within Ontario's Greater Toronto Area (GTA) and provides significant employment and recreational opportunities as well as housing types. The Study Area is served by Highway 410, a major provincial transportation Highway, as well as the Canadian National Railway and Metrolinx railway, located in the southern part of the Study Area, which provides for GO Train and Via Rail service from the Brampton Innovation District GO Station (described below) located at 27 Church Street West (immediately west of Main Street). Interregional service is also provided via links with Mississauga Transit and Züm Bus Rapid Transit service. Within the Project Study Area limits, there are also numerous industrial and commercial businesses. Most notably, along portions of Kennedy Road, Queen Street, Hurontario Street, McLaughlin Road, Bovaird Drive and Sandalwood Parkway. In addition, low and medium density residential development with some high-density high-rise developments (primarily along arterial roads) are common throughout the Study Area. Recently, the City of Brampton in partnership with Metrolinx announced the renaming of the Brampton GO station as Brampton Innovation District GO. The station is in the heart of downtown Brampton in the City's growing innovation district. This branding will further enhance Brampton's position as an innovation and technology event destination to host tech sector events and international delegations, while enhancing Brampton's unique ability to attract highly skilled talent from both the Toronto and Kitchener-Waterloo areas.

The Brampton Innovation District GO is also an integral part of the Brampton 2040 Vision: Living the Mosaic (May 2018) that is a comprehensive and strategic planning document that will guide development over the next 25 years resulting in a connected, inclusive and innovated city. Specific to the Kennedy Road Sanitary Trunk Sewer Study Area, Brampton 2040 Vision includes area plans or "first concepts" for Downtown Brampton, centred along Queen Street and Main Street and Uptown Brampton centred along the Kennedy Road and Steeles Avenue corridors. Also included are infill plans for the Kennedy Road and Sandalwood Parkway area. Refer to Appendix F1 for area plans.

4.4.2 Town of Caledon

The Town of Caledon is situated within the GTA immediately north of the City of Brampton, offering residents access to employment, recreational activities, and diverse housing options. The area benefits from its proximity to major transportation routes, including Highway 410 and the Canadian National Railway, which facilitate connections to other parts of the region. Additionally, the Town is served by GO Transit and other regional transit services, providing convenient commuting options. The Town of Caledon features a mix of land uses, including industrial and commercial areas, particularly along major roadways, as well as residential developments ranging from low to high density.

Primary areas of growth within the project study area include Mayfield West Secondary Plan area that includes surrounding lands to the south and north of Old School Road in addition to local intensification corridor along Hurontario Street.

4.4.3 Peel Region Future Infrastructure Projects

The Region's key future projects, including their target in-service dates, are summarized in Figure 4-2.

4.4.4 City of Brampton Future Infrastructure Projects

The City of Brampton is currently preparing to start construction for the Etobicoke Creek realignment flooding mitigation project (Riverwalk) which includes the realignment of Ken Whillans Drive which is south of Vodden Street at Etobicoke Creek (Duggan Park). This project also includes upgrades to Church Street from Main Street to Kennedy Road (proposed connection to Kennedy Road STS) including new Etobicoke Creek culvert. It is anticipated that these works will be completed prior to construction of the Kennedy Road Sanitary Trunk Sewer.

Other City of Brampton future infrastructure projects are shown in the Figure 4-3.

Figure 4-2: Peel Region Future Infrastructure Projects

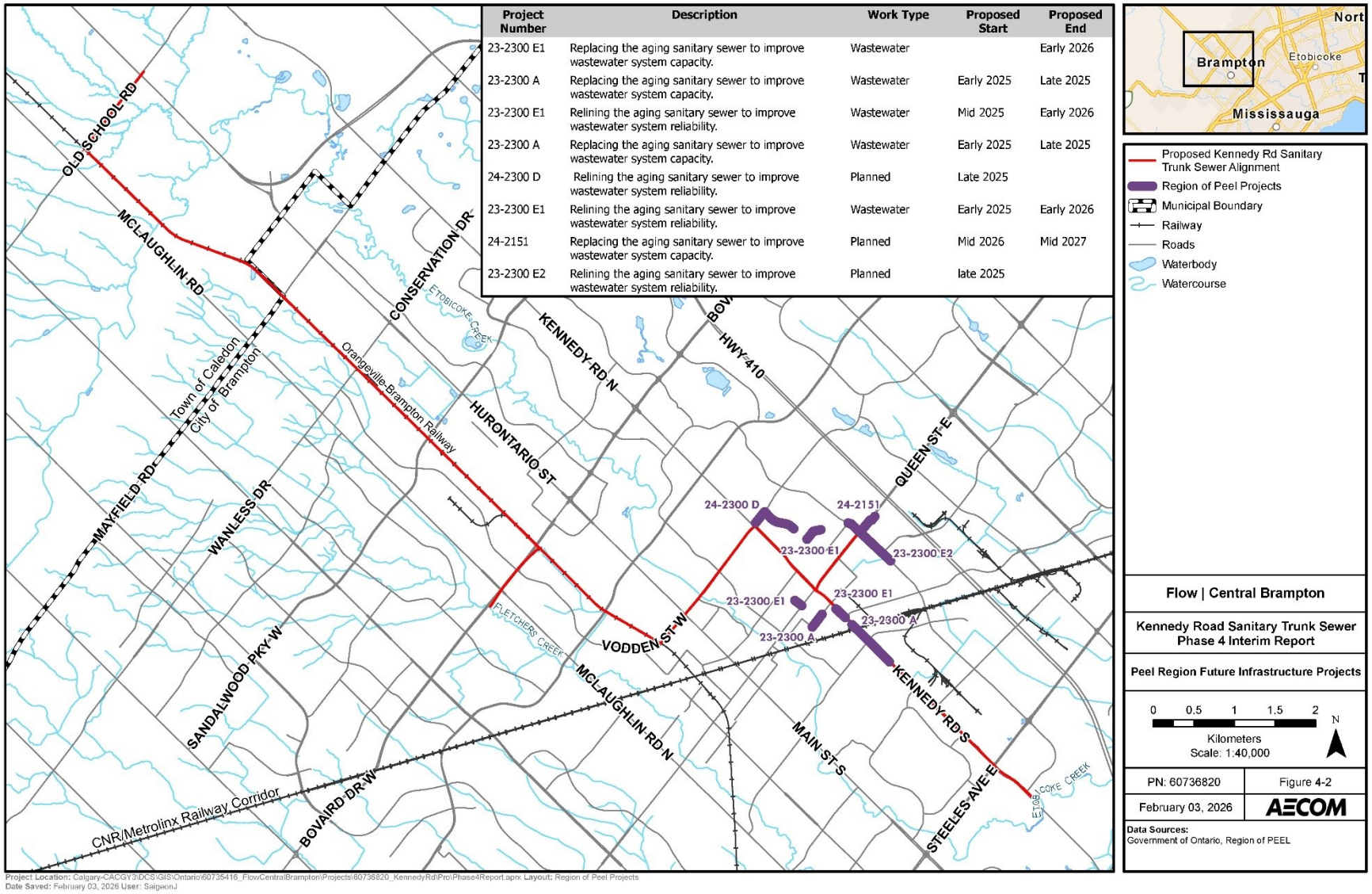
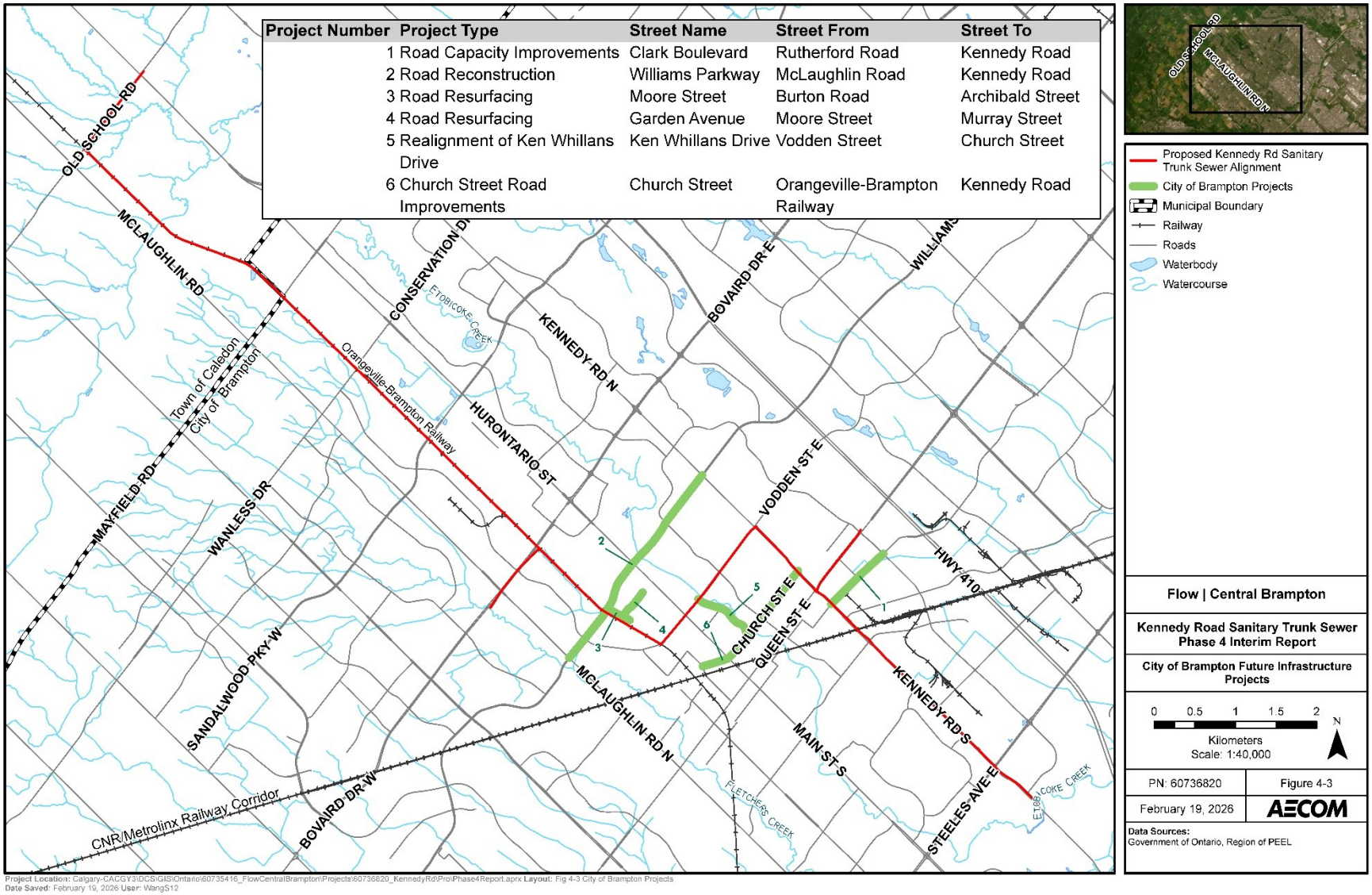


Figure 4-3: City of Brampton Future Infrastructure Projects



4.4.5 Town of Caledon Future Infrastructure Projects

Specific to the project Study Area, the Town of Caledon is planning to widen Old School Road from the OBR and easterly towards Hurontario Street (Figure 4-4). It is envisioned that the road widening will follow the completion of the Kennedy Road Sanitary Trunk Sewer on Old School Road. The Kennedy Road detailed design team will coordinate with the Town of Caledon Public Works department and Flow Central Caledon to ensure that infrastructure conflicts are avoided.

4.5 Agricultural Resources

An Agricultural Impact Assessment (AIA) was prepared by DBH Soil Services Inc. to identify potential impacts on agricultural resources and operations within the Study Area. The AIA identified that a small portion of the Study Area in the northern part is located in a Prime Agricultural Area (defined as Specialty Crop Areas and / or areas with Canada Land Inventory Classes 1-3 lands).

It is important to note that the entire area from Mayfield Road to Old School Road will eventually be completely urbanized with no agricultural operations as per "2051 New Urban Area" (Schedule E-1 of Peel Official Plan: Regional Structure, April 2022).

A copy of the Agricultural Impact Assessment is provided in Appendix G.

4.6 Cultural Heritage Environment

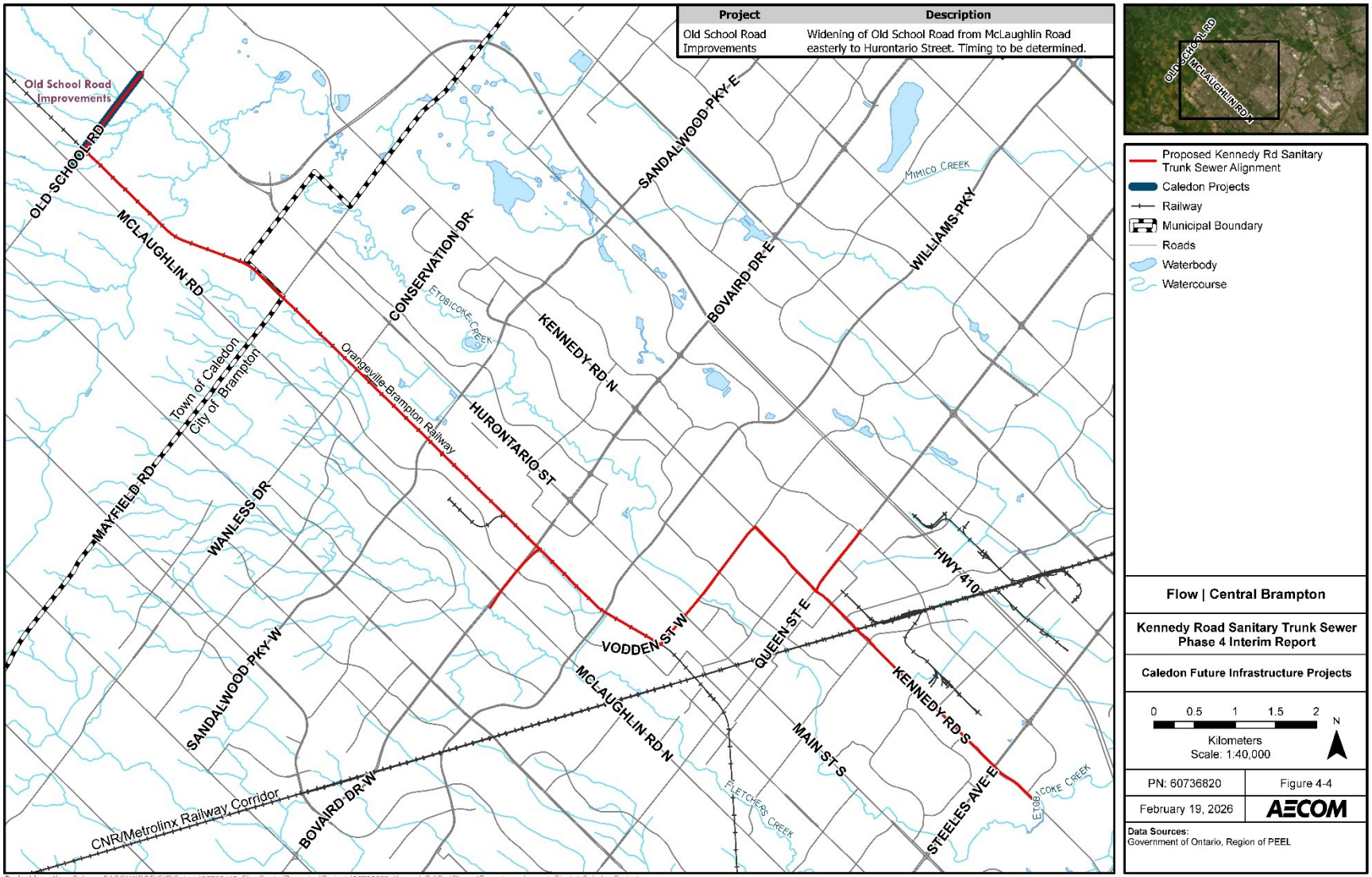
4.6.1 Archaeological Resources

A Stage 1 AA was completed by AECOM to evaluate the archaeological potential associated with the list of proposed short-listed routing options as described in Section 5.6.3.1.

The Stage 1 Archaeological Assessment consisted of a review of geographic, land use, and historical records for the areas along the short-listed route options and the relevant surrounding area, together with consultation with the Ministry of Citizenship and Multiculturalism (MCM) to determine the presence of any registered archaeological sites on or near the area.

The Stage 1 AA Report results informed the Phase 2 short-list routing options evaluation and has been provided in Appendix H. The Stage 2 Archaeological Assessment is to be undertaken during the detailed design phase of the project, at which time any outstanding gaps identified through the Stage 1 Archaeological Assessment will be addressed and documented in the Stage 2 AA report.

Figure 4-4: Town of Caledon Future Infrastructure Projects



4.6.2 Built Heritage Resources (BHRs) and Cultural Heritage Landscapes (CHLs)

A Cultural Heritage Report (CHR) was undertaken to identify cultural heritage resources, including Built Heritage Resources and Cultural Heritage Landscapes associated with the short list of alternatives for the proposed sanitary sewer. AECOM completed the MCM's Criteria for Evaluating Potential for BHR and CHL checklist to screen for the known BHRs and CHLs within the Study Area.

AECOM undertook a review of publicly available municipal, provincial, and federal heritage registers and consult with stakeholders, including MCM, Ontario Heritage Trust, and municipal/heritage planning staff, to identify the presence of known Built Heritage Resources and Cultural Heritage Landscapes and identify heritage-related concerns. The CHR followed the process for identifying above-ground BHR and CHLs outlined in the MCM Criteria for Evaluating Potential BHR and CHL.

The results of the CHR informed the Phase 2 short-listed routing options evaluation. A copy of the CHR is provided in Appendix I.

4.7 Transportation

4.7.1 Road Network

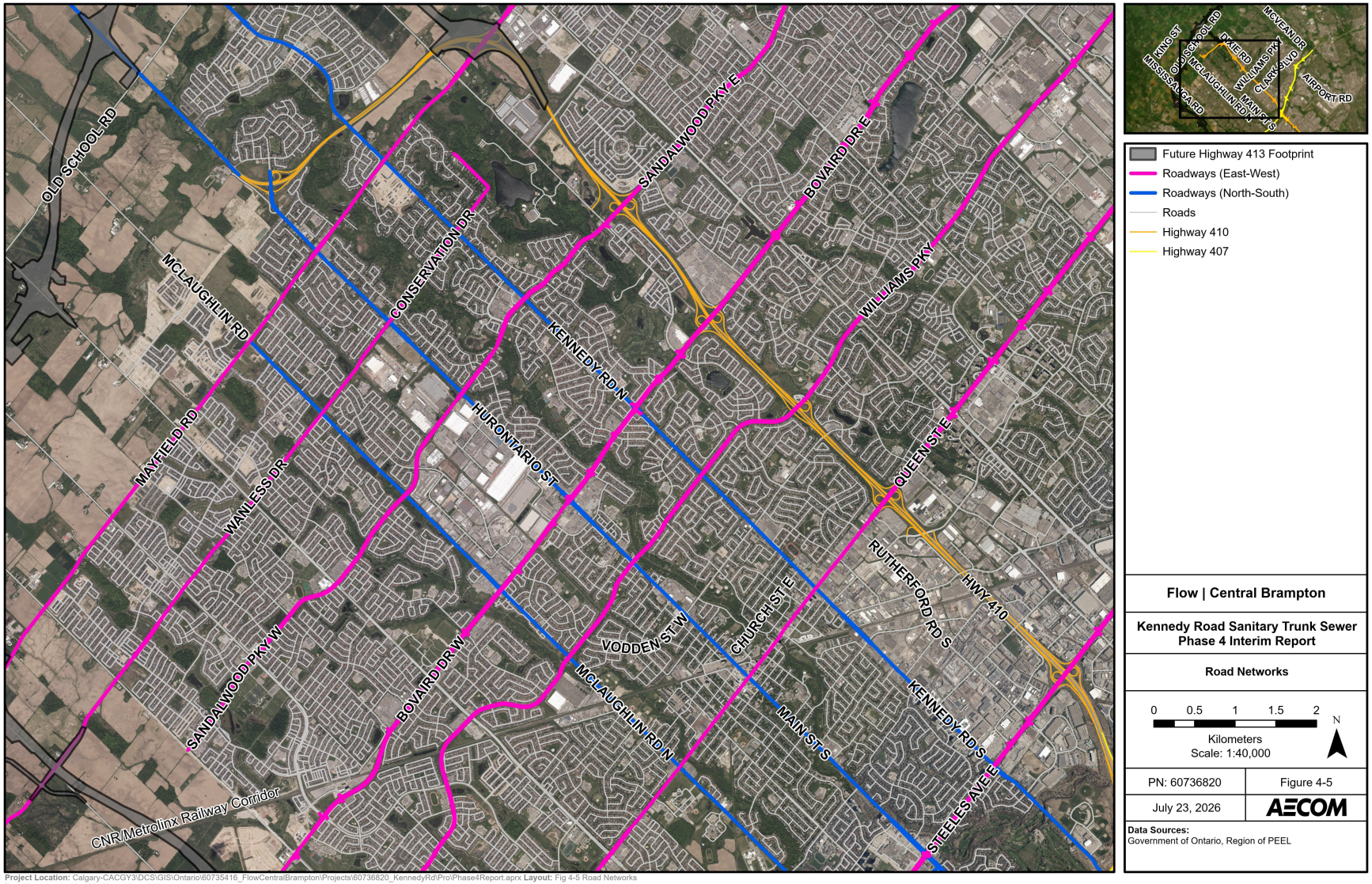
The roads within the Study Area are under the jurisdiction of either the MTO, Peel Region, the City of Brampton, or the Town of Caledon. This includes Highway 410 in the northeast quadrant and along the east boundary of the Study Area. Roadways under Peel Region's or City of Brampton's jurisdiction include the following:

- McLaughlin Road, Hurontario Street / Main Street South, and Kennedy Road: for this study we refer these roadways as running north-south.
- Steeles Avenue East, Queen Street East, Williams Parkway East, Bovaird Drive East, Sandalwood Parkway East, Wanless Drive/Conservation Drive and Mayfield Road: for this study we refer these roadways as running east-west.

The above roads are further broken down by Provincial, Regional, and Municipal jurisdiction in Sections 4.7.1.1 to 4.7.1.3.

Within the Town of Caledon, the major roadways in this Study Area are Old School Road, running east-west as well as Highway 10/Hurontario Street and McLaughlin Road with both running north to south. The above roadways are shown in Figure 4-5. In addition to the above noted transportation corridors, there are multiple collector and local roadways that form the complete transportation network.

Figure 4-5: Road Network



Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Projects\60736820_KennedyRd\Pro\Phase4Report.aprx **Layout:** Fig 4-5 Road Networks
Date Saved: July 16, 2026 **User:** WangS12

The north-to-south transportation corridors travel over major structures, including the Canadian National Railway/Metrolinx rail corridor and Etobicoke Creek. East-west transportation corridors also cross Etobicoke Creek and Fletchers Creek, and the former OBR Corridor.

4.7.1.1 Provincial Road Network

The Ontario Ministry of Transportation's (MTO) Highway Corridor Management Manual serves as the primary policy framework for protecting the safety, operational efficiency and inter-expansion capacity of provincial highway right-of-ways. It outlines how the MTO exercises its discretionary authority under the Public Transportation and Highway Improvement Act. The manual establishes review guidelines based on designated permit control areas measured from the highway limits or intersections.

The section of Highway 410 captured within the Study Area is the transition between the freeway and Hurontario Street where an interchange provides access to the nearby residential areas along Valleywood Boulevard, as well as allowing vehicles from Hurontario Street to access Highway 410 and vehicles on Highway 410 to exit north or south onto Hurontario Street.

The MTO has completed the preliminary design for the future Highway 413 that will cross the Study Area at the north end. The preferred Highway 413 route runs east to west north of Old School Road through the Town of Caledon. It is important to note that the proposed McLaughlin Road and Old School Road alignments fall within the Highway 413 Focused Analysis Area, portions of which are gradually being released for development. This includes a small portion of land at the intersection of Old School Road and Hurontario Street (south side of Old School Road). A future Transit Way Station is proposed at the northwest intersection of Hurontario Street and Old School Road.

4.7.1.2 Regional Road Network

The Regional roadways within the Study Area are classified in the Peel Region Official Plan Schedule F-2 (Major Road Network) and Schedule F-3 (Regional Road Mid-Block Right of Way Requirements). The following Table 4-2 outlines the sections of regional roadways that were considered in the identification and evaluation of the long list of routes for the sanitary trunk sewer. Copies of the relevant Schedules are included in Appendix J1.

Table 4-2: Regional Road Network Classification and Right of Way

Road Name	From/To	Schedule F2 Regional Road Classification	Schedule F3 Right of Way Width (Metres)
Kennedy Road	Bovaird Drive East to south of Williams Parkway	Major Road	36
Kennedy Road Note 1	South of Williams Parkway to just south of Steeles Avenue East	Major Road	30
Steeles Avenue	Kennedy Road North to Main Street South	Major Road	45
Bovaird Drive East	McLaughlin Road North to Kennedy Road	Major Road	45
Mayfield Road	McLaughlin Road North to Kennedy Road	Major Road	50

Note 1: At the time of writing there was a discrepancy between Peel Region Official Plan and the City of Brampton Official Plan. The information presented here is that shown in the Region's Official Plan, which is the more recent document. Note that the City's Official Plan shows a small section of Kennedy Road. between Queen Street and south of Vodden Street East as being under City jurisdiction.

Regional Good Movement Corridors are identified in the Regional Official Plan, Figure 16. These corridors include the Primary Routes on the following roadway sections that were considered in the long-list of alternative routes:

- Kennedy Road from south of Steeles Avenue East to Bovaird Drive East
- Bovaird Drive between Kennedy Road North and McLaughlin Road North
- Queen Street east of Kennedy Road North
- Mayfield Road between Kennedy Road North and McLaughlin Road North

A connector truck route exists along Hurontario between Bovaird Drive East, and Mayfield Road, continuing as a Primary Route north of Highway 410.

4.7.1.3 Municipal Road Network

The City roadways within the Study Area are classified in the City of Brampton Official Plan Schedule 3C (Streets Network to 2051) and Schedule 4 (City Road Right-of-Way Widths). The following Table 4-3 outlines the sections of City roadways that were considered in the identification and evaluation of the long list of routes for a new large diameter sanitary trunk sewer. Copies of the relevant Schedules are included in Appendix J1.

Table 4-3: City of Brampton Road Network Classification and Right of Way

Road Name	From/To	Schedule 3C City Road Classification	Schedule 4 Right of Way Width (metres)
Hurontario Street	Williams Parkway to Mayfield Road	Major Arterial Note 1	40 to 45
Main Street	Williams Parkway to Harold Street	Major Arterial	26 to 30
Main Street	Harold Street to Nanwood Drive	Major Arterial	36
Main Street	Nanwood Drive to just south of Steeles Avenue	Major Arterial	50 to 55
McLaughlin Road North	Bovaird Drive West to Mayfield Road	Minor Arterial Note 2	36
Kennedy Road	Bovaird Drive East to Mayfield Road	Minor Arterial	36
Kennedy Road	Steeles Avenue to just south of Steeles Avenue	Minor Arterial	36
Sandalwood Parkway	McLaughlin Road to Kennedy Road	Major Arterial	40 to 45
Queen Street	Kennedy Road North to Rutherford Road North	Major Arterial	40 to 45
Wanless Drive	McLaughlin Road North to Hurontario Street	Minor Arterial	36
Williams Parkway	Vodden Street West to Kennedy Road North	Minor Arterial	36
Conservation Drive	Hurontario Street to Kennedy Road	Collector Note 3	23 to 26
Vodden Street West	OBR Corridor to Kennedy Road North	Collector	23 to 26

Note 1: Major Arterial roads serve major centres of activity, intra-area travel between suburban centres, between larger communities and between major trip generators. Major arterial roads serve the longest trips and carry the major portions of the trip entering and leaving the overall area.

Note 2: Minor Arterial roads interconnect with and augment the major arterial road system. They connect major arterials to collector arterials and small generators. They provide service to medium size trip generators and distribute travel to small geographical areas and communities than those identified within the major arterial system.

Note 3: Collector roads distribute trip from major and minor arterial roads to the ultimate destination or may collect traffic from local roads and channel into the major/minor road systems. They carry a low proportion of traffic travelling through the entire subarea and also carry a high proportion of local traffic within that area.

The Town roadways are classified within the Town of Caledon Official Plan Schedule J (Road Classification) and Schedule K (Right of Way Width) as outlined in Table 4-4 were considered in the identification and evaluation of the long list of routes for a new large diameter sanitary trunk sewer. Copies of the relevant Schedules are included in Appendix J1.

Table 4-4: Town of Caledon Road Network Classification and Right of Way

Road Name	From/To	Schedule J Town Road Classification	Schedule K Right of Way Width (Metres)
McLaughlin Road North	Mayfield Road to Old School Road	Collector	26
Old School Road	McLaughlin Road North to Hurontario Street	Collector	26

There are many local roads throughout the Study Area that were not considered in the development of the long list of routing options for the proposed sanitary trunk sewer; routing alternatives consist only of arterial and collector roads.

4.7.2 Peel Region's Strategic Good Movement Network

The Peel Region's Strategic Goods Movement Network includes Primary Truck Routes and Connector Truck Routes which may support better connectivity for trucks in the future. Applicable Primary and Connector Truck Routes are listed below:

- Primary Truck Routes:
  - Mayfield Road
  - Bovaird Drive West and East
  - Kennedy Road South of Bovaird Drive East
  - Steeles Ave West and East
  - Hurontario Street north of Mayfield Road
- Connector Truck Routes:
  - Hurontario Street north of Bovaird Drive to Mayfield Road
  - Main Street South (South of Steeles)

4.7.3 Rail Corridors

The Canadian National Railway/Metrolinx Kitchener/Waterloo/Toronto Corridor generally runs east-west through the Study Area, with the Brampton Innovation GO Rail Station located at 27 Church Street West (immediately west of Main Street). The rail corridor is generally located south of Queen Street East, east of Main Street, but is north of Queen Street West, west of Main Street (see Figure 4-3). This rail corridor passes over the following roadways:

- Kennedy Road South, south of Queen Street
- Queen Street, east of Main Street

- Hurontario Street, north of Queen Street
- McLaughlin Road, south of Williams Parkway

The rail crossing structures pose potential restrictions for lane closures and other construction activities and were considered in determining the short-list of alternative routes.

The former OBR corridor also runs north to south (east of McLaughlin Road) through the Study Area from the Canadian National Railway/Metrolinx corridor to Old School Road. This corridor was purchased by Peel Region and ownership has been transferred to the City of Brampton and Town of Caledon. The agreement allows Peel Region to use the railway corridor for infrastructure purposes. The railway corridor was identified as a potential route for the Kennedy Road Sanitary Trunk Sewer at the outset of the Kennedy Road Sanitary Trunk Sewer EA (see Figure 4-6).

4.7.4 Transit Network

The existing transit network crossing through the Study Area includes the Canadian National Railway/Metrolinx GO rail corridor. There is an existing GO Rail Station near the Main Street / Queen Street intersection, and the rail line along this corridor provides 15-minute, two-way, all-day service.

The existing local transit network in the Study Area includes Brampton Transit (refer to Figure 4-7). Brampton Transit bus terminals are located at Steeles Avenue and Main Street (i.e., the Brampton Gateway Terminal), as well as in the area north of Queen Street and Main Street (i.e., the Downtown Terminal).

The City's Brampton Transit and Bus Rapid Transit "Züm" routes that run through the Study Area, include:

- Brampton Transit:
  - Route 3 (McLaughlin)
  - Route 7 (Kennedy)
  - Route 8 (Centre)
  - Route 9 (Vodden)
  - Route 23 (Sandalwood)
  - Route 29 (Williams)
  - Route 52 (McMurchy)
  - Route 81 (Mayfield West)
  - Route 202 (Mayfield 202)
  - Route 203 (Mayfield 203)
  - Route 204 (Mayfield 204)
- Züm:
  - 501 (Queen)
  - 501 (Main)
  - 505 (Bovaird)
  - 511 (Steeles)

Figure 4-6: Rail Corridors within Study Area

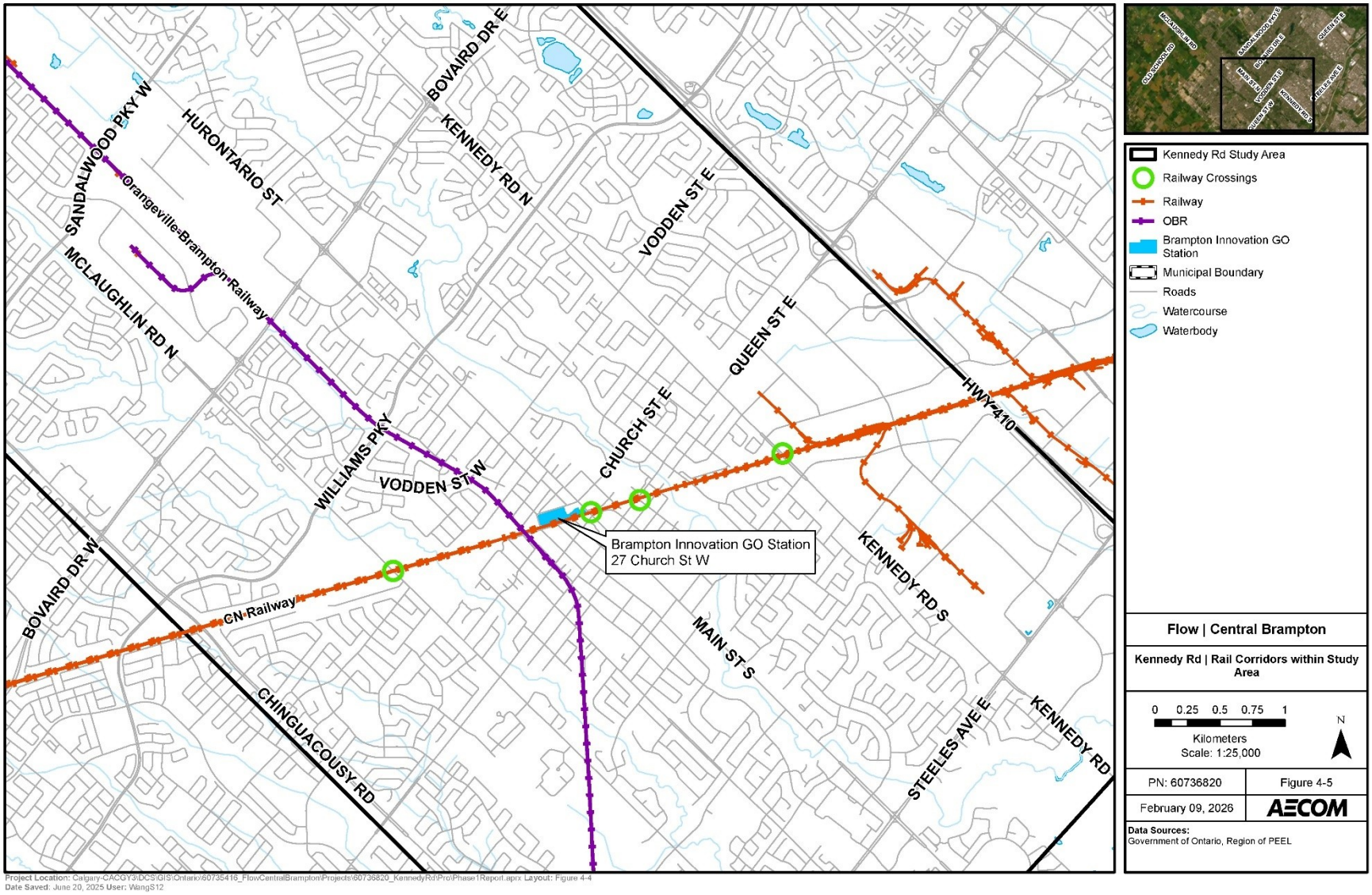
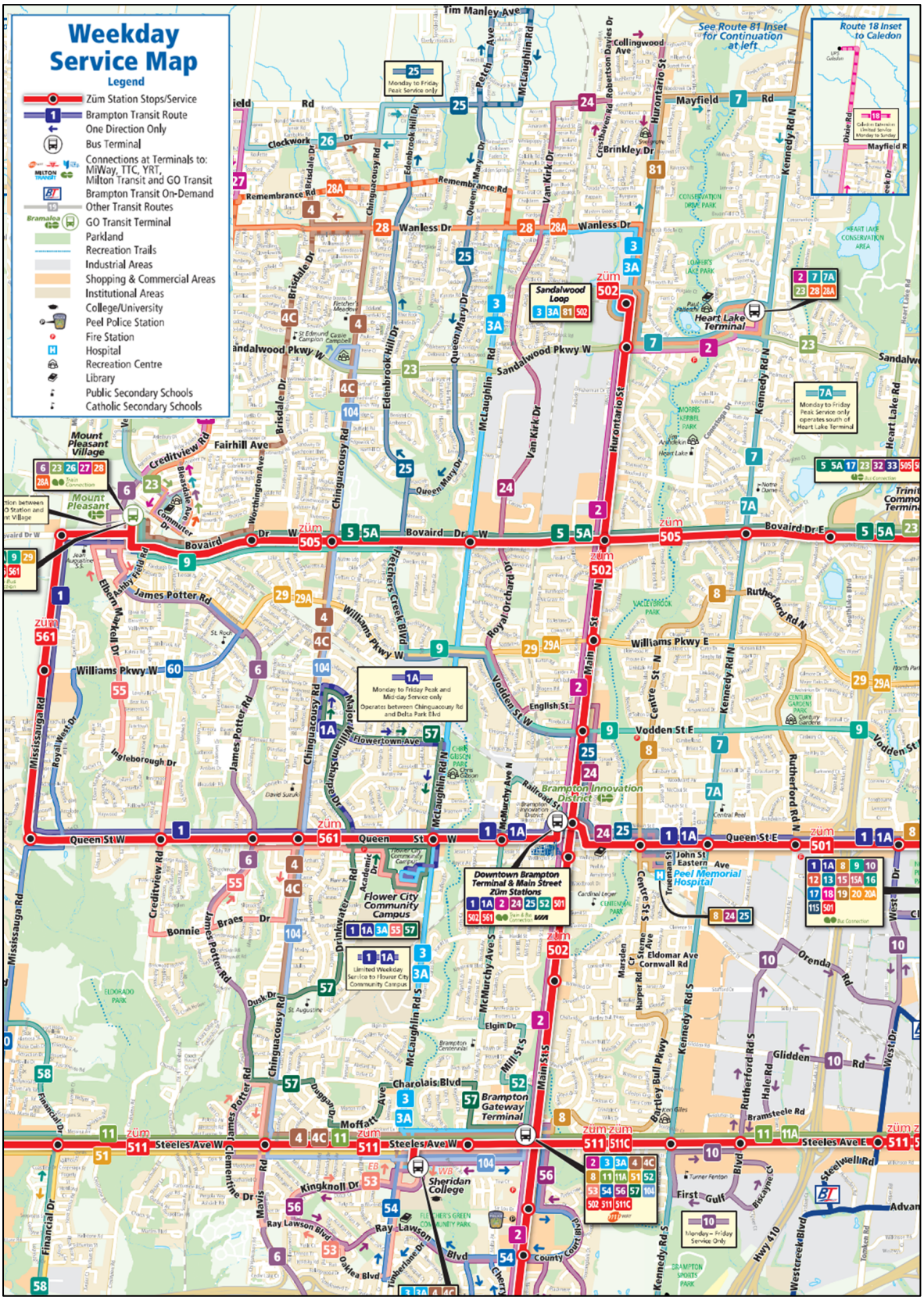


Figure 4-7: Brampton Transit Weekday Service Map



There are many plans for transit service expansion within and surrounding the Study Area. As per the City's Official Plan, Schedule 1B -Major Transit Station Areas and supporting Schedules 13b, 13d, 13e, 13f, 13l, and 13m, as well as Peel Region's Official Plan (Schedule E-5 – Major Transit Station Areas), within the Growth Plan Priority Transit Corridor, Primary Major Transit Station Areas are identified along Main Street South, at the intersections of Steeles Avenue and Queen Street as well as south of Steeles Avenue along Main Street. The Mayfield West Transit Hub between Queen Street and Steeles Avenue along Main Street is also identified as a Planned Major Transit Station Area. There is a section of Queen Street between Main Street and Kennedy Road that is identified as a Primary Major Transit Station Area but is not part of Peel Region's Growth Plan Priority Transit Corridors.

The City's Official Plan, Schedule 3B outlines the Transit Network to 2051. Building on the City's Official Plan, the long term conceptual Rapid Transit Corridors identified in Peel Region's Official Plan (Schedule F-1 – Rapid Transit Corridors), Main Street South is identified as a Light Rail Transit corridor and Queen Street East (i.e., east of Main Street) is identified as a Bus Rapid Transit corridor. Schedule F1 identifies Kennedy Road, Steeles Avenue, Bovaird Drive, Sandalwood Parkway and Main Street North as Other Rapid Transit Corridors.

All relevant Schedules are included in Appendix J1 for reference.

4.7.5 Active Transportation Network

The Study Area includes a pedestrian network of sidewalks and multi-use paths along the identified roads. Pedestrian and cycling infrastructure on local crossing streets within the Study Area are not mentioned here, only facilities on roadways that were considered as alternative routes for the STS.

As per Figure 14 (Existing Regional Road Pedestrian Network) of the Region's Official Plan, the following regional roads have sidewalk/multi-use paths:

- Kennedy Road (generally has sidewalks on both sides between Steeles Avenue and Mayfield Road)
- Steeles Avenue (sidewalks on both sides between Kennedy Road and Main Street)
- Bovaird Drive (sidewalks on both sides between Kennedy Road and Main Street)

Figure 13 (Existing and Long-Term Regional Road Cycling Network) of the Region's Official Plan identifies that Kennedy Road between Steeles Avenue and Bovaird Drive, Steeles Avenue and Mayfield Road do not have planned cycling infrastructure. Bovaird Drive was identified as having a multi-use path for cyclists.

From the City of Brampton's 2022 Cycling Map the following cycling infrastructure has been identified along the Study Area roads:

- Kennedy Road between Conservation Drive and Arctic Tern Avenue (Multi-use path)
- Main Street between Nanwood Drive and Wellington Street (Bike lanes)
- Main Street between Quarry Edge Drive and Wanless Drive (Multi-use path)
- Bovaird Drive (Multi-use path)

The City of Brampton's Official Plan, Schedule 3A (Active Transportation Network) identifies the following proposed facilities within the Study Area:

- Kennedy Road between Bovaird Drive and Conservation Drive (protected bike lane or cycle track)
- Main Street between Steeles Avenue and Nanwood Drive (protected bike lane or cycle track)
- Main Street between Nanwood Drive and Wellington Street (bike lane or buffered bike lane)
- Main Street between Nelson Street East and Vodden Street (bike lane or buffered bike lane)
- Main Street/Hurontario Street between Vodden Street and Highway 410 (protected bike lane or cycle track)
- McLaughlin Road between Steeles Avenue and Sandalwood Parkway (protected bike lane or cycle track)
- Mclaughlin Road between Sandalwood Parkway and Wanless Drive (multi-use path)
- Queen Street between Kennedy Road and Centre Street (protected bike lane or cycle track)
- Conservation Drive between Kennedy Road and Hurontario Street (bike lane or buffered bike lane)

The Town of Caledon Trails Map (online) identifies an on-road cycling route within the Study Area along Old School Road and Kennedy Road (i.e., the Etobicoke Creek Trail Connector). Signs are posted along the routes and identify that each route is maintained between May 1st and October 31st, annually.

Within the Study Area there is the Etobicoke Creek Recreation Trail, a paved trail following the Etobicoke Creek from the south end of the Study Area to the north end, and McLaughlin Valley Recreational Trail. Both are shared trails between pedestrians and cyclists. There are also several paved and unpaved trails through parks shared by cyclists and pedestrians in the Study Area.

All relevant Schedules are included in **Appendix J1** for reference.

4.8 Utilities

The Study Area contains significant water and wastewater infrastructure, including east-west water transmission mains and sanitary trunk and sub-trunk sewers, servicing Brampton's downtown core. Planned infrastructure to support the various Queen Street Major Transit Station Areas must also be considered alongside the numerous private utilities in the area, many of which are significant in size and include both buried and aerial components. All these factors are critical in evaluating the shortlist of potential sanitary trunk sewer routes.

In Phase 2 of the Environmental Assessment process (confirmation of short-listed routes), the Study Team used Peel Region's Geographic Information Systems and ePal systems to identify existing infrastructure. In addition, private service providers were engaged through the Public Utilities Coordinating Committee to confirm the locations and sizes of their infrastructure, adhering to Subsurface Utilities Engineering Quality Level D standards.

5. Phase 2: Development of Alternative Sanitary Trunk Sewer (STS) Routes

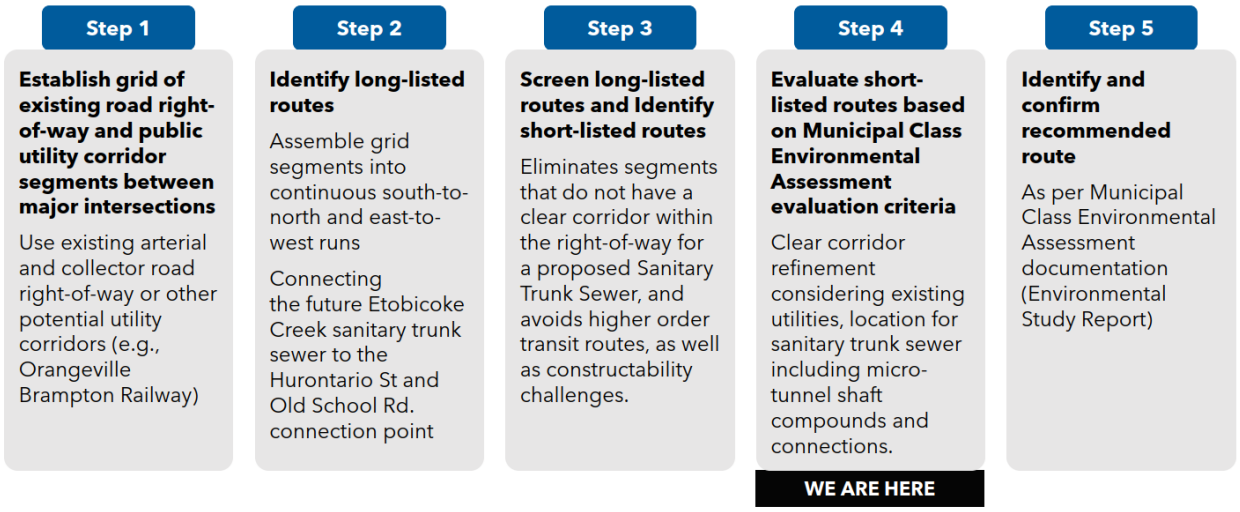
5.1 Overview of Phase 2

The objective for Phase 2 is to evaluate the short list Sanitary Trunk Sewer routing options and to document the preferred servicing strategy.

The evaluation of each short list routing option took into consideration the evaluation criteria, including Natural Environment, Socio – Economic, Cultural, Legal/Jurisdictional, Technical (e.g., utility conflict review, traffic impact analysis, geotechnical, hydrogeological considerations), Climate Change, and Economic/Financial evaluation factors.

The long list and short list of routes were generated using the steps outlined in Figure 5-1 below:

Figure 5-1: Sanitary Trunk Sewer Routing Identification and Evaluation Methodology



Key Phase 2 activities are summarized below:

- Identify short-list sanitary trunk sewer routing alternatives to allow evaluation,
- Develop draft evaluation criteria,
- Evaluate Short List STS routing options using available Phase 1 desktop study outputs and a selection matrix that includes the above evaluation criteria, with phasing and implementation considerations,

- Co-ordinate meetings with review agencies, including, among others, the City of Brampton and Town of Caledon, TRCA, CVC, MTO, Metrolinx and CN Rail, to inform and gain feedback on the proposed alignments for the sanitary trunk sewers,
- Document feedback and verify the evaluation for the preferred STS routing alignment supported by remaining technical studies, and
- Confirm the preferred STS routing alignment.

5.2 Servicing Strategies

The following growth servicing strategies were developed to address the problem and opportunity statement:

1. **Do Nothing:** No improvements would be undertaken to address near, mid, and long-term wastewater conveyance requirements. The "Do Nothing" alternative would not allow any of the alternative growth servicing strategies to be implemented (maintains status quo).
2. **Limit Growth:** Considers maintaining existing wastewater conveyance demands by limiting the ultimate extent and/or location of future development (requires amendment to the Region's and local municipality's official plans).
3. **Rehabilitate Existing Trunk Sewer:** Rehabilitate existing Fletchers Creek and ECTSs to address Inflow/Infiltration and free up conveyance capacity. This will allow limited growth within the existing trunk sewers service area.
4. **Upsize/Upgrade with New Infrastructure:** Implement new Kennedy Road STS with connections to divert flows from Fletchers Creek and Etobicoke Creek Trunk Sewer (ECTS) sewer catchment areas to the new STS. The new Kennedy Road STS will convey flows to the soon to be constructed ECTS Twinning at Kennedy Road (north of Highway 407).

Alternatives 1) and 2) were screened out from consideration as they do not address the Phase 1 Problem and Opportunity Statement. Alternative 3) partially addresses the Problem and Opportunity Statement when implemented with Alternative 4). Alternative 4) in conjunction with Alternative 3 best address the Problem and Opportunity Statement and as such Phase 2 of the MCEA alternative solutions focused on the identification and evaluation of Kennedy Road STS routing options as documented below.

5.3 Long List of Sanitary Trunk Sewer (STS) Route Alternatives

With such a large study area, there are a number of possible alternative routes that the proposed STS could follow. As such, it was first necessary to identify a list of alternative STS routes that could reasonably be expected to be constructed. Alternative STS routes were generated by first identifying a "long list" of potential alternative routes and then screening those routes to identify the most appropriate "short list" for comparative evaluation. This approach, which is briefly described below and summarized in Table 5-1, resulted in the identification of two north and two south alternative STS routes for comparative evaluation, each of which could be used for routing between the future Etobicoke Creek STS and Old School Road / Hurontario Street connection points.

5.3.1 Methodology

A five-step routing identification and evaluation methodology (as presented in Figure 5-1) was developed as follows:

- Step 1: Establish a grid of existing road right-of-way and public utility segments. Figure 5-2: Step 1 – Road Network and Grid Options shows the existing roadway network and grid of potential routing segment options following the application of Step 1.
- Step 2: Identify the long-listed routes by assembling the grid segments into continuous south-to-north and east-to-west runs connecting the future ECTS and Old School Road / Hurontario Street connection points. Refer to Figure 5-3: Step 2 – Long List Route Options.
- Step 3: Screen the long-listed routes by avoiding route segments with significant constraints and identifying the most direct routes and those that may provide an opportunity to be co-ordinated with other planned infrastructure improvements. Figure 5-4 and Figure 5-5: Step 3 – Short List Route Options shows the long list of potential routing segments following the application of Steps 2 and 3 and resulting short-list routes.
- Step 4: Evaluate south and north short-listed routes.
- Step 5: Identify and recommend short listed south and north routes. Refer to Figure 5-6: Combined North and South Short Listed Routes.

Table 5-1 further expands on and summarizes the process used to identify the long-listed and short-listed routing options.

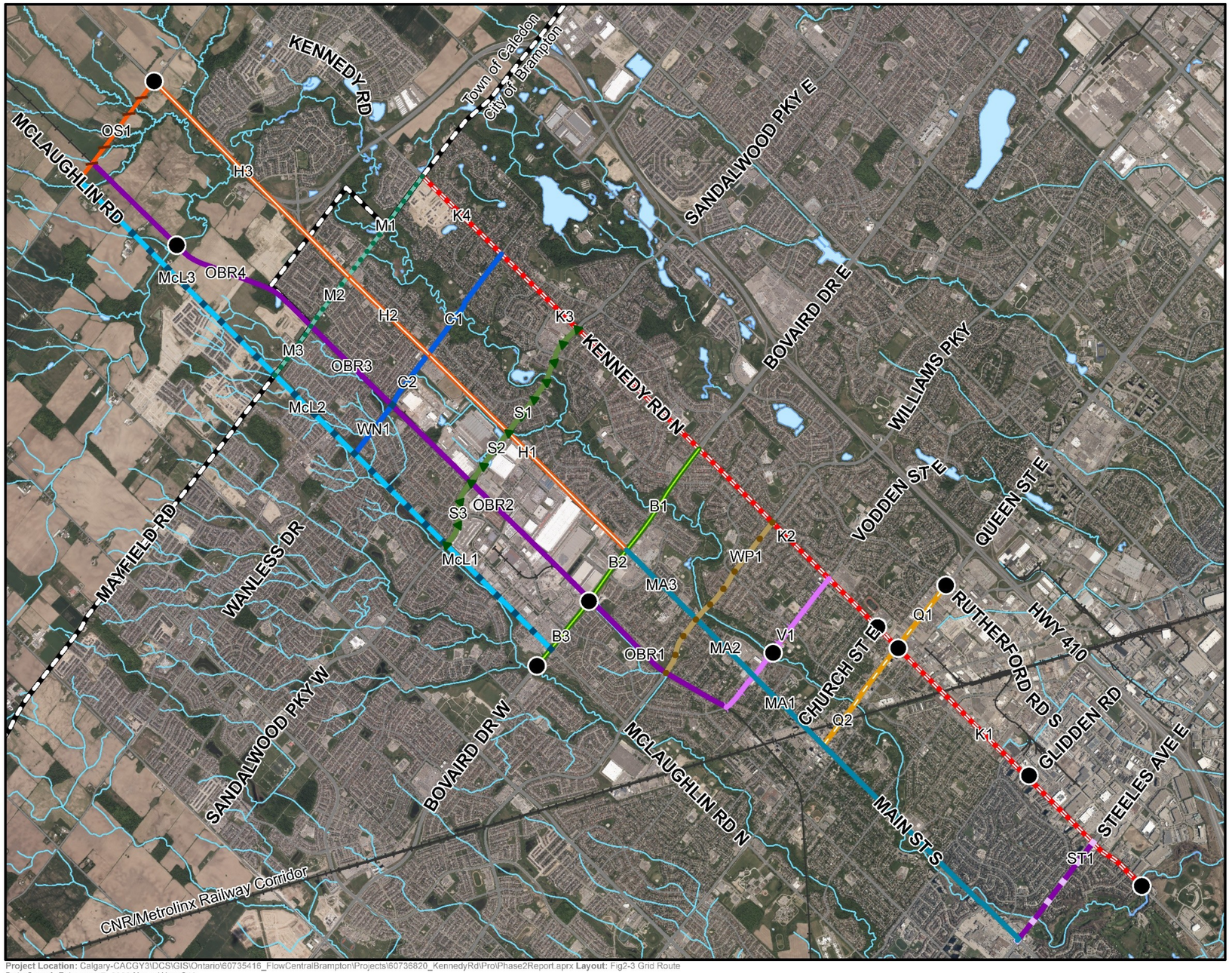
Table 5-1: Identification of Alternative STS Routing Methodology

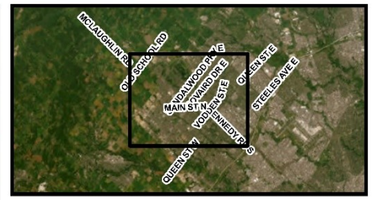
Step	Criteria/Considerations	Rationale	Results
Step 1: Establish grid of existing road right-of-way and public utility corridor segments (see Figure 5-2: Road Network and Routing Options Grid).	■ Focus on south-to-north routes leaving the Future Etobicoke Creek Sanitary Trunk Sewer at Kennedy Road and heading north towards the proposed connection point at Hurontario Street and Old School Road.	■ Optimize hydraulic performance and avoid back-tracking/convoluted routes, inefficient designs.	■ Logical North to South routes and east to west connection routes identified as per **Figure 5-2: Road Network and Routing Options Grid**. ■ Connection points confirmed (North and South) ■ Study area boundary delineated.
	■ Use existing arterial and collector road right-of-ways which have a minimum right-of-ways width of 23 metres.	■ Existing right-of-ways generally avoid or minimize sensitive surface environmental features and the need for private property taking. ■ Arterial and collector roads are preferred over local roads because their greater Right-Of-Way widths facilitate good access for STS construction and maintenance, while maintaining at least some vehicular traffic flow and minimizing effects on local residents.	■ Existing roadway network reviewed, and all arterial/collector roads identified.
	■ Consider existing south-to-north or east-to-west public utility easements that provide connectivity between arterial/collector roads.	■ Existing easements generally avoid or minimize sensitive surface environmental features and the need for private property taking.	■ Existing abandoned OBR Corridor added between Vodden Street and Old School Road.
	■ Avoid routes within or immediately adjacent to Highway 410 corridor or Canadian Pacific Railway/ Metrolinx, if possible, due to the Ontario Ministry of Transportation and Canadian Pacific Railway/Metrolinx guidelines/requirements.	■ Compliance with the Ontario Ministry of Transportation and CN Railway corridor management policies and ease of approvals.	■ Highway 10 from Mayfield Road to Old School Road (segment number H3) removed due to complicated Highway 410 crossing including lengthy Ontario Ministry of Transportation approval ■ CN Railway/Metrolinx corridor removed from consideration due to CN Railway restrictions related to installation of linear infrastructure in rail corridor right of way.
	■ Avoid valley trail systems due to TRCA and CVC guidelines/requirements and sensitive natural environmental features.	■ Compliance with TRCA and CVC valley corridor management policies and ease of approvals. ■ Optimize ease of access for sanitary sewer construction and maintenance.	■ Etobicoke Creek and Fletchers Creek valley lands removed from consideration.
	■ Consider local roads and new easement options that provide connectivity between arterial/collector roads.	■ Facilitates strategic linkages between more preferred routing segments.	■ No local roads identified. ■ Easements are required for connection to existing Etobicoke Creek STS (north side of Bovaird) and existing Fletcher's Creek STS (west of McLaughlin Road and Bovaird Drive)

Step	Criteria/Considerations	Rationale	Results
Step 2: Identify long-listed routes by assembling grid segments into continuous south-to-north and east-to-west runs connecting the future Etobicoke Creek STS to the Hurontario Street and Old School Road connection point (see Figure 5-3: Long Listed Routing Options).	■ Identify and avoid route segments with significant constraints, including: ■ Higher order transit corridors; ■ High traffic volumes; and	■ Ensure minimum clear zone to accommodate construction requirements of new pipe.	**Segments Removed from Consideration** ■ Main Street from Bovaird Drive to Steeles Avenue (segments MA1, MA2, MA3) to Kennedy Road removed from consideration due to impacts to road network, high traffic volumes and transit. ■ Steeles Ave (segment ST1) from Hurontario Street to Kennedy Road removed from consideration due to impacts to road network, high traffic volumes and transit. ■ Queen Street (segment Q2) West of Kennedy Road to Main Street removed due to existing and proposed infrastructure constraints related to future Major Transit Station Areas in addition to impacts to road network, high traffic volumes and transit.
Step 3: Screen long-listed routes and identify short-list routing options (see Figure 5-4 and Figure 5-5: Short-List Routing Options)	■ Congested right-of-way with utilities that are difficult to relocate. ■ Identify most direct routes (i.e., minimize number and degree of bends, identify shortest distances) with preference for long, straight alignments	■ Optimize operations and reduce construction costs.	■ Mayfield Road between Kennedy Road and McLaughlin Road (segments M1, M2, M3) removed due to congested right of way with utilities which also eliminates segments of Kennedy Road between Bovaird and Mayfield Road (segments K3 and K4) ■ Conservation Drive between Kennedy Road and McLaughlin Road (segments C1, C2) removed due to congested right-of-way with utilities. ■ Wanless Drive between OBR corridor and McLaughlin Road (segment WN1) removed due congested right-of-way with utilities. ■ Williams Parkway from Kennedy Road North to OBR Corridor (segment WP1) - potential 5-year moratorium related to City's proposed road reconstruction, also consider impacts to the traveling public including Transit. Also more complex tunnelling due to curves in the road alignment. ■ Sandalwood Parkway between Kennedy Road and McLaughlin Road (segments S1, S2, S3) removed due to more complex tunnelling dur to curves in the road alignment. **Short List Routes Carried Forward South Section** ■ Route S1: Kennedy Road North from future Etobicoke Creek Trunk Sewer to Bovaird Drive including Bovaird Drive from Kennedy Road North to McLaughlin Road (including westerly connection to existing Fletchers Creek STS. ■ Route S2: Kennedy Road from future Etobicoke Creek STS to Vodden Street including Vodden Street from Kennedy Road to OBR as well as OBR corridor from Vodden Street to Bovaird Drive **North Section** ■ Route N1: OBR corridor from Bovaird Drive to Old School Road, including Old School Road from OBR corridor to Hurontario Street. ■ Route N2: McLaughlin Road from Bovaird Drive, including Old School Road from McLaughlin Road to Hurontario Street.

Step	Criteria/Considerations	Rationale	Results
Step 3: Screen long-listed routes and identify short-list routing options (see Figure 5-4 and Figure 5-5: Short-List Routing Options) (continued)	■ Identify routes that provide opportunities to be co-ordinated with other planned infrastructure improvements such as future road widening, active transportation improvements, infrastructure replacement and/or road reconstruction.	■ Opportunity to complete both projects in one construction window. ■ Minimize the frequency of disruptions to road users (i.e., only inconvenience once at one location).	■ Construction of STS in Orangeville Brampton corridor provides opportunities for co-ordination with future multi-use trail
Step 4: Evaluate short-listed routes.	■ Evaluation factor groups and criteria that meet the definition of the environment as per the Environmental Assessment Act (refer to **Table 3-1** and **Table 3-2**).	■ Compliance with the Municipal Environmental Assessment Class Environmental Assessment document and Environmental Assessment Act.	■ Senior staff review and acceptance of the advantages/disadvantages associated with each short-listed route.
Step 5: Identify and confirm recommended routes.	■ Review agency (e.g., TRCA, CVC, Ontario Ministry Environment Conservation and Parks, Ontario Ministry Citizenship Multiculturalism, etc.) and public comments received from PIC# 2. ■ Senior staff review and acceptance of recommendations.	■ Wide acceptance of preferred routes.	■ Preferred routes form the basis for ESR and preliminary/detailed design.

Figure 5-2: Step 1 – Road Network and Route Options Grid





- Sanitary Trunk Sewer (STS) Connections
- Municipal Boundary
- Railway
- Waterbody
- Watercourse

Longlisted Routing Options

- Kennedy Rd N Alternative Route
- Queen St Alternative Route
- Bovaird Dr Alternative Route
- Former Orangeville Brampton Railway Corridor
- Old School Rd Alternative Route
- Conservation Dr Alternative Route
- Mclaughlin Rd N Alternative Route
- Mayfield Rd Alternative Route
- Vodden St W Alternative Route
- Hurontario Alternative Route
- Steeles Ave Alternative Route
- Main St Alternative Route
- Sandalwood Pky Alternative Route
- Williams Parkway Alternative Route

Flow | Central Brampton

Kennedy Road Sanitary Trunk Sewer

Step 1: Kennedy Rd Existing Roadway Network and Routing Options Grid

0 0.5 1 1.5 2
Kilometers
Scale: 1:40,000

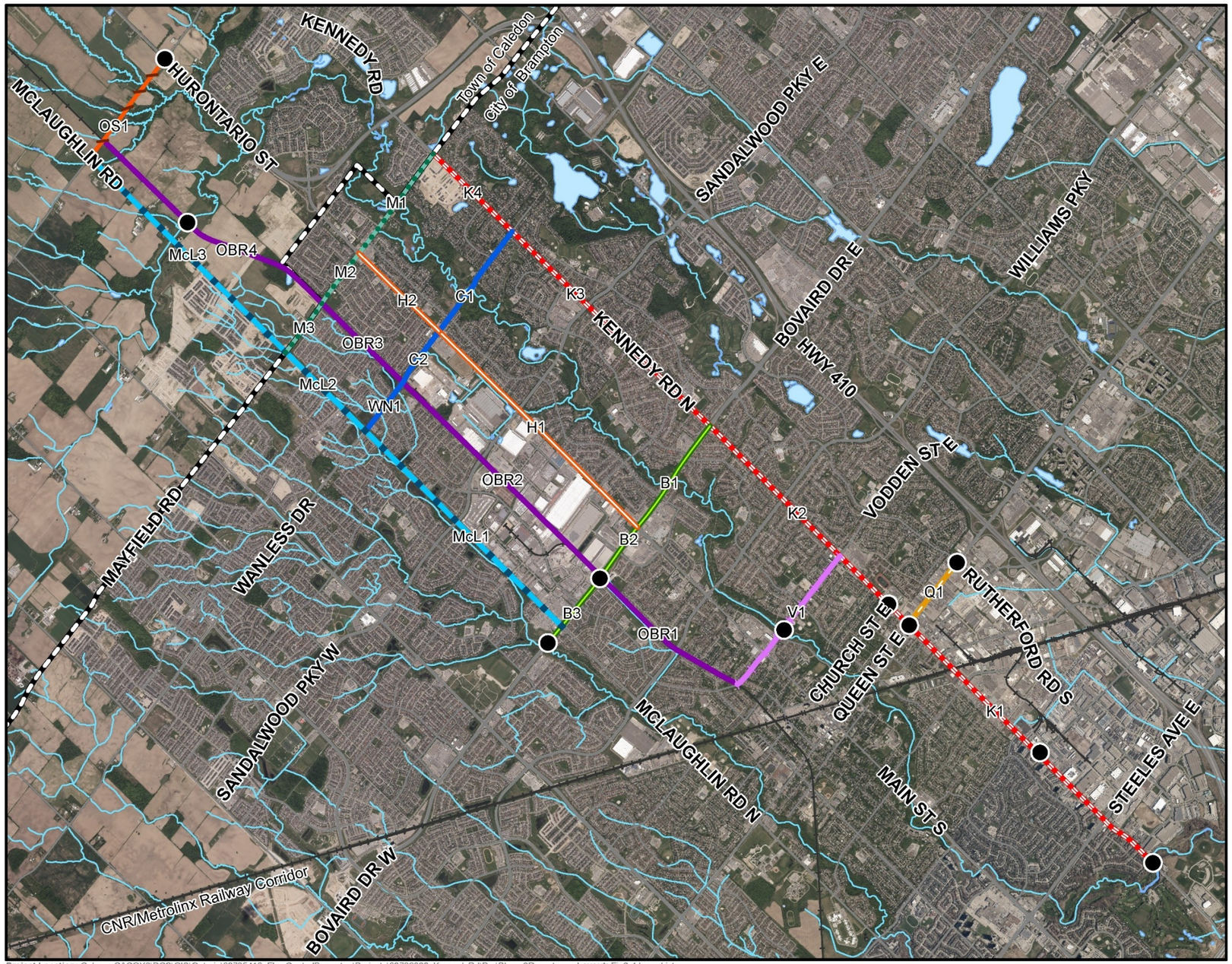
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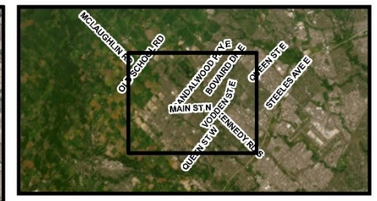
PN: 60736820	Figure 5-2
February 19, 2026	AECOM

Data Sources:
Government of Ontario, Region of PEEL

Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Projects\60736820_KennedyRd\Pro\Phase2Report.aprx **Layout:** Fig2-3 Grid Route
Date Saved: February 17, 2026 **User:** WangS12

Figure 5-3: Step 2 – Long List Route Options





Sanitary Trunk Sewer (STS) Connections

Longlisted Routing Options

- Kennedy Rd N Alternative Route
- Queen St Alternative Route
- Bovaird Dr Alternative Route
- Former Orangeville Brampton Railway Corridor
- Old School Rd Alternative Route
- Conservation Dr Alternative Route
- Mclaughlin Rd N Alternative Route
- Mayfield Rd Alternative Route
- Vodden St W Alternative Route
- Hurontario Alternative Route
- Steeles Ave Alternative Route
- Main St Alternative Route
- Sandalwood Pky Alternative Route
- Williams Parkway Alternative Route
- Municipal Boundary
- Railway
- Waterbody
- Watercourse
- Roads

Flow | Central Brampton

Kennedy Road Sanitary Trunk Sewer

Step 2: Kennedy Rd Long List Routing Options

0 0.5 1 1.5 2

Kilometers
Scale: 1:40,000

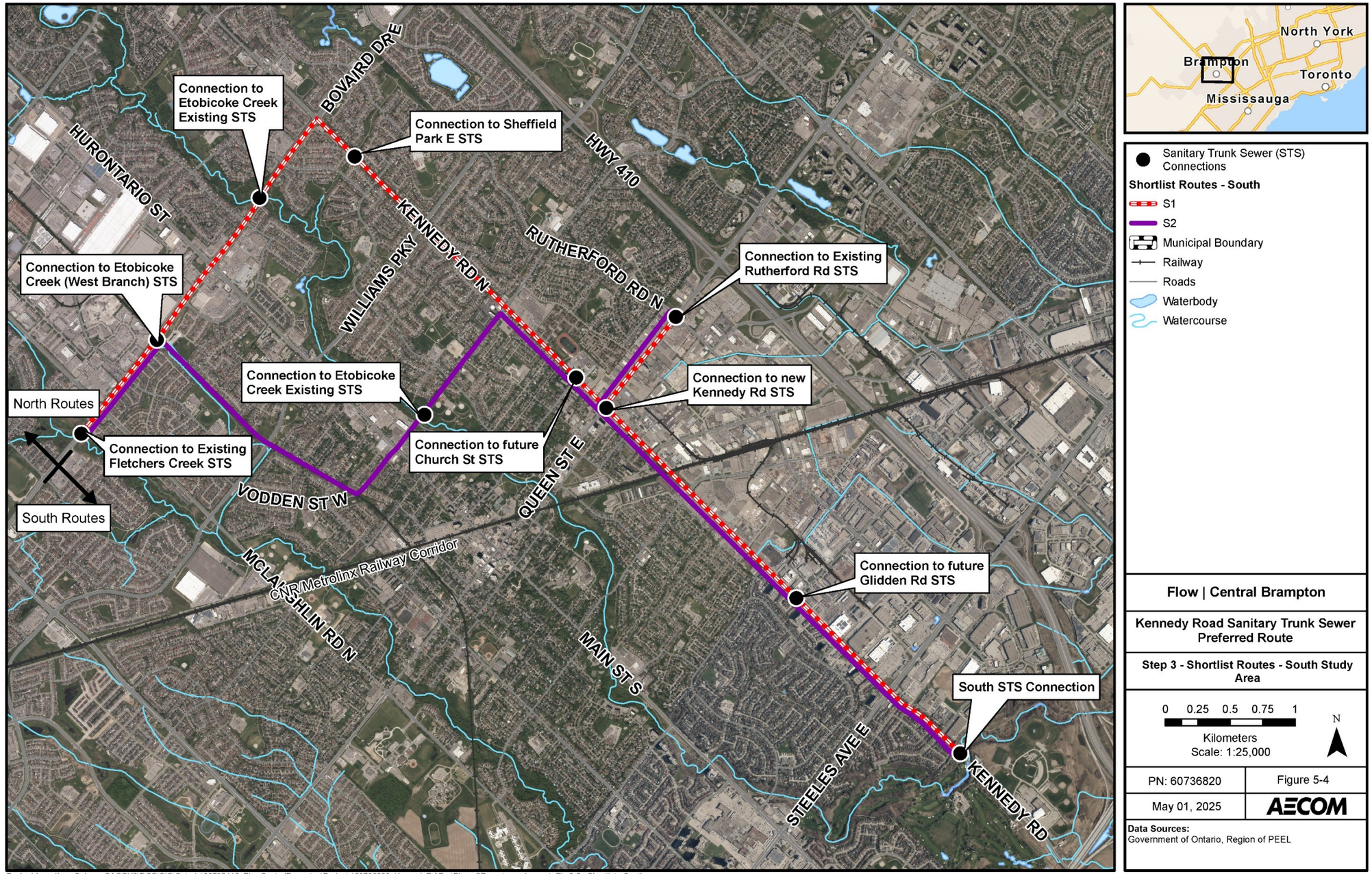
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PN: 60736820	Figure 5-3
February 17, 2026	AECOM

Data Sources:
Government of Ontario, Region of PEEL

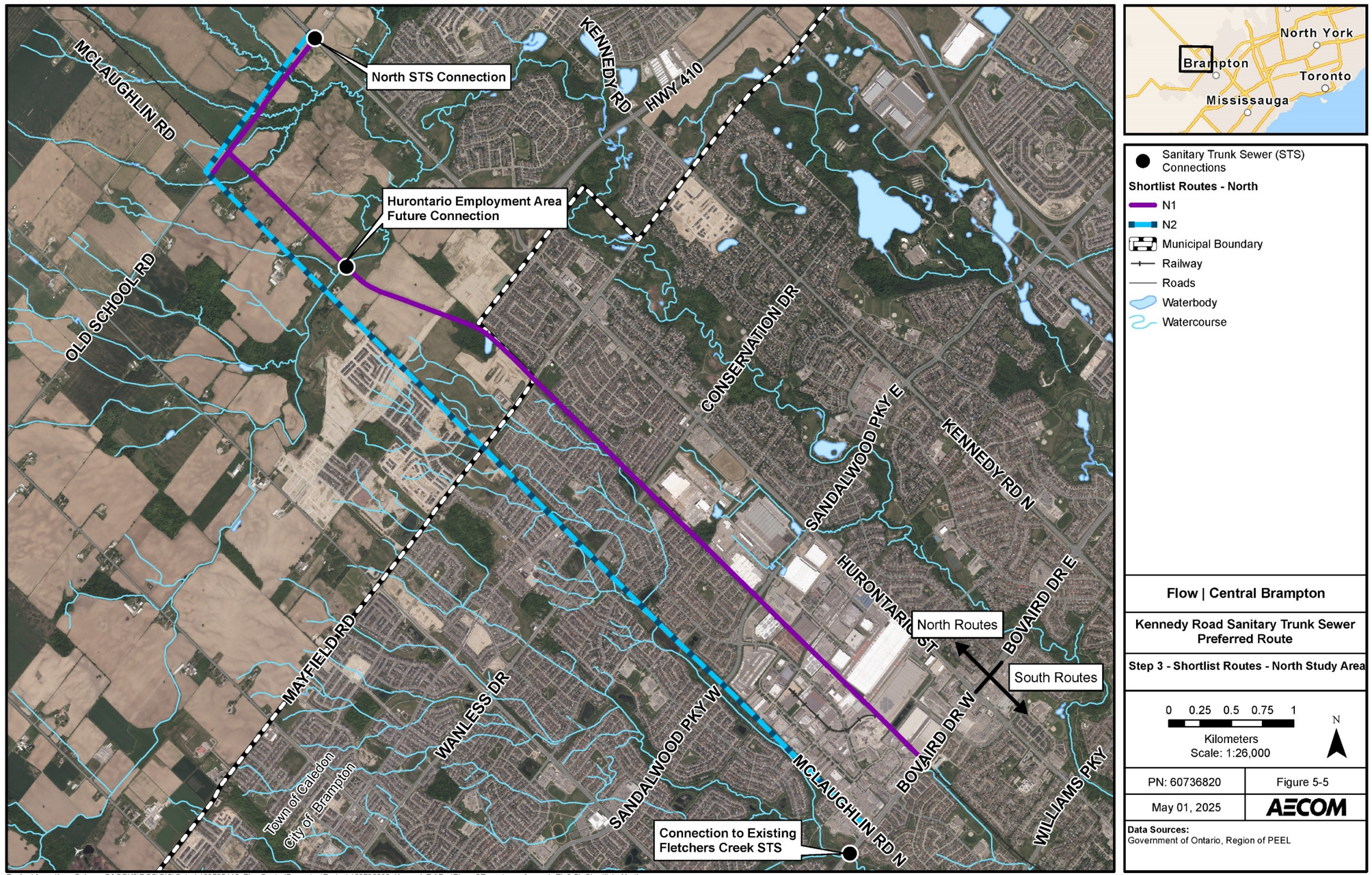
Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Projects\60736820_KennedyRd\Pro\Phase2Report.aprx **Layout:** Fig2-4 Long List
Date Saved: February 13, 2026 **User:** WangS12

Figure 5-4: Step 3 – Short List Route Options – South Study Area



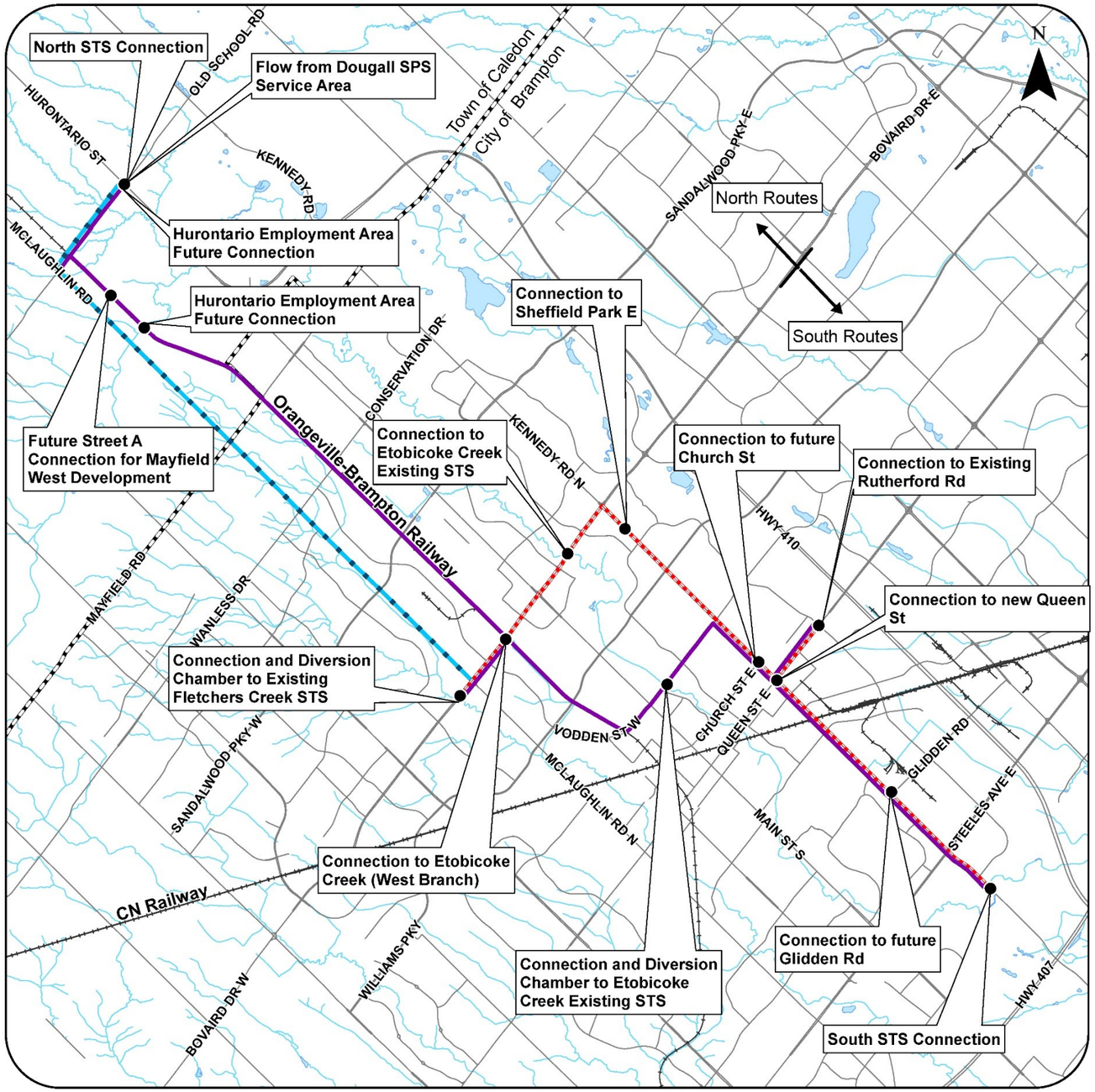
Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Projects\60736820_KennedyRd\Pro\Phase2Report.aprx **Layout:** Fig 2-5a Shortlist - South
Date Saved: May 01, 2025 **User:** SaigeonJ

Figure 5-5: Step 3 – Short List Route Options – North Study Area



Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Projects\60736820_KennedyRd\Pro\Phase2Report.aprx **Layout:** Fig2-5b Shortlist - North
Date Saved: May 01, 2025 **User:** SaigeonJ

Figure 5-6: Combined North and South Short Listed Routes



Shortlist Routes

- S1
- S2
- N1
- N2

FLOW | Central Brampton

General Legend

- Sanitary Trunk Sewer (STS) Connections
- Municipal Boundary
- Railway
- Roads
- Waterbody
- Watercourse

Data Sources:

Government of Ontario, Region of Peel
PN: 60736820
Feb, 11, 2026



5.4 Short List of STS Route Alternatives

Based on the above, the following short-list routes proceeded to the evaluation phase to arrive at a preferred alternative solution:

- South Study Area:
  - Route S1: Kennedy Road North from future Etobicoke Creek Trunk Sewer to Bovaird Drive including Bovaird Drive from Kennedy Road North to McLaughlin Road (including westerly connection to existing Fletchers Creek STS.
  - Route S2: Kennedy Road from future ECTS to Vodden Street including Vodden Street from Kennedy Road to OBR as well as OBR corridor from Vodden Street to Bovaird Drive.
  - Refer to **Figure 5-4**
- North Study Area:
  - Route N1: OBR corridor from Bovaird Drive to Old School Road, including Old School Road from OBR corridor to Hurontario Street.
  - Route N2: McLaughlin Road from Bovaird Drive, including Old School Road from McLaughlin Road to Hurontario Street.
  - Refer to **Figure 5-5.**

The combined north (N1, N2) and south (S1, S2) recommended short listed routes are shown in **Figure 5-6**.

5.5 Assessment of Alternative Routes

5.5.1 Overview of Evaluation Process

The following sub-sections describe the evaluation process used to review information for selecting the preferred south and north STS routing options. This includes an overview of how each alternative route was evaluated, along with a summary of the advantages, disadvantages, and key considerations associated with each option.

5.5.2 Evaluation Criteria and Methodology

An evaluation framework was developed as presented in Table 5-2 below based on seven environmental components that together address the broad definition of the environment as described in the *Environmental Assessment Act*[2].

Table 5-2: Evaluation Framework Components

Component	Description
Natural Environment	Component having regard for protecting the natural and physical components of the environment (i.e., air, land, water and biota), including natural heritage and environmentally sensitive areas.
Socio-economic Environment	Component that evaluates potential effects on residents, neighbourhoods, businesses, and community character.
Cultural Environment	Component that considers potential impacts on historical/archaeological and cultural heritage resources.
Legal/Jurisdictional	Component that considers potential land requirements and compliance with planning policies.
Technical Environment	Component that considers the technical suitability and other engineering aspects of the water system.
Climate Change	Component that considers potential effects of climate change mitigation and adaptation.
Economic/Financial	Component that compares the potential financial costs.

Based on the above-listed components, Table 5-3 presents the final evaluation criteria.

Each alternative STS route was evaluated from least preferred to most preferred based on the evaluation criteria presented in Table 5-3 below. The route with the lowest possible adverse effects was then identified as the preferred route.

This evaluation is not based on a weighted numerical ranking system. Instead, a descriptive or qualitative evaluation using professional judgement and expertise of the Project Team was used to consider the practical suitability and feasibility of each alternative route. Each route option was evaluated by the Project Team based on its ability to meet the project objectives, minimize potential environmental effects, and achieve technical efficiencies.

2. The Environmental Assessment Act (Section 1. (c) (i) to (vi)) defines the "environment" as: "air, land, water, plant and animal life including humans; the social and cultural conditions that influence the life of humans or a community; any building, structure, machine or other device or thing made by humans; any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or; any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario." This definition of the environment is used and is reflected in the environmental components used in the evaluation of alternative sanitary trunk sewer routing options.

Table 5-3: Criteria for Evaluating Alternative STS Routes

Evaluation Criteria	Indicator/Consideration
A. Natural Environment	
A1. Potential effects on water resources	■ Disruption to fish including spawning periods and physical changes to aquatic habitat (e.g., number and type of watercourse crossings)
	■ Anticipated amount of groundwater management (e.g., potential short-term water taking)
A2. Potential effects on terrestrial features	■ Loss of or disruption to sensitive species habitat and natural heritage features (e.g., significant wetlands and woodlands, significant wildlife habitats [SWH], proximity to provincially or locally/regionally rare amphibians, birds or wildlife)
A3. Potential effects on Species at Risk and Species at Risk habitat	■ Loss of or disruption/disturbance to Species at Risk or their habitats affecting the species ability to carry out its critical life processes in the local area.
A4. Potential effects on soil and groundwater	■ Potential to encounter soil and groundwater contamination and ability to mitigate
B. Socio-Economic Environment	
B1. Number of potentially impacted sensitive receptors[3] during construction and potential for increased noise, dust and vibration and reduced property access and potential business losses related to customers avoiding trips to high traffic commercial areas	■ Schools ■ Daycares ■ Hospitals and emergency services ■ Nursing homes ■ Long-term care facilities ■ Places of worship ■ Recreational facilities and community centres ■ Parks ■ High traffic commercial areas ■ Libraries ■ Cemeteries
B2. Traffic and active transportation impacts during construction, including expected lane, sidewalk, trails, and bike lane closures	■ Expected number/direction/duration of open lanes during construction and reduction in the number of intersecting roads affected by potential shaft locations
	■ Potential for increased public scrutiny related to inconvenience of higher traffic volumes/closures
	■ Opportunities to enhance active transportation
B3. Potential impacts on public transit during construction, including bus stop closure/relocation	■ Relocation of bus shelters and transit stops
	■ Temporary service interruptions
	■ Consideration of higher order transit routes
B4. Potential impacts on agricultural operations	■ Impacts on Canada Land Inventory Class 1-3 prime agricultural lands
C. Cultural Environment	
C1. Potential for loss and/or disturbance to potential archaeological resources	■ Loss of or destruction of significant cultural heritage resources and archaeological sites including burial sites
C2. Potential effects on built heritage resources and cultural heritage landscapes	■ Loss of or disruption to built heritage resources and cultural heritage landscapes (e.g., loss of a historic farmhouse or significant disruption of agricultural lands of a historic farmstead).
D. Legal/Jurisdictional	
D1. Compliance with applicable planning policies	■ Potential conflicts with Peel Region, Town of Caledon, and City of Brampton Official Plan policies, including Secondary Plans, Master Servicing Plans and TRCA and CVC regulations
D2. Land requirements	■ Number of temporary and/or permanent easements

[3] Sensitive receptors refer to people, places, or things that could be affected by impacts from construction.

Evaluation Criteria	Indicator/Consideration
E. Technical	
E1. Constructability	■ Right-of-way width, ■ length of pipe, ■ Sewer/shaft depth ■ Construction methodology, ■ Significant major infrastructure crossings ■ Shaft locations (e.g., in travelled section of right-of-way versus outside of travelled section of right-of-way)
E2. Permits and approvals	■ Complexity and duration to obtain the necessary permits and approvals (e.g., Ontario Ministry of Transportation, CN Railway, Metrolinx and TRCA, CVC permits for work in regulated areas)
	■ Road ownership/occupancy permit
E3. Connection points to existing and future Sanitary Trunk Sewers and sub-trunks	■ Ability to optimize connections to free up capacity in the existing system
E4. Operations and Maintenance	■ Accessibility to maintenance chambers sites and sewer pipes
E5. Conflicts with existing utilities	■ Significance of existing utilities and infrastructure and ability to maintain existing services or relocate existing utilities
E6. Conflicts with existing or planned infrastructure improvements	■ Ability to avoid or mitigate conflicts with existing infrastructure
	■ Opportunity to co-ordinate STS with other planned infrastructure improvements (e.g., OBR Multi-Use-Trail) including road resurfacing
E7. Construction truck traffic management issues during construction	■ Ease of access to haul routes and ease of truck traffic management
F. Climate Change	
F1. Climate change mitigation	■ Potential for generating greenhouse gas emissions
F2. Climate change adaptation	■ Vulnerability of project/infrastructure to climate change effects
G. Economic / Financial	
G1. Estimated construction costs	■ Relative construction costs compared to other routes
G2. Estimated operations and maintenance costs	■ Potential access issues related to shaft locations and pipe depth
	■ Relative operations and maintenance costs compared to other routes

5.6 Evaluation of Short-listed Routing Alternatives

The following sub-sections describe the evaluation process that was used to gather and review all of the information to select the preferred route for each north and south shortlisted routes. Also included is an overview of how each alternative route was evaluated under each criteria, including a summary of the advantages, disadvantages or key considerations for each alternative route. **Appendix K: Short-listed Route Evaluation Matrices** provides a detailed evaluation of the alternative routes and identifies **Alternative Route S2 (Kennedy Road-Vodden Street/OBR) and N1 (OBR/Old School Road)** as the overall preferred recommended routes.

5.6.1 Natural Environment

As part of the natural environment component of this MCEA study, an evaluation of the aquatic and terrestrial natural heritage features and functions associated with the short-listed route alternatives was completed. This evaluation was completed based on a desktop review of existing background documents and databases to identify environmental constraints associated with each route alternative Study Area (e.g., south and north sections). The Study Area includes a strip of land that extends 120 metres on both sides of each proposed route option to understand potential impacts. Studies and information sources relevant to the Study Area that were reviewed included the following:

- City of Brampton Official Plan (2024a),
- City of Brampton Open Data (2024b),
- Region of Peel Official Plan[4], Schedules and Figures (April 2022),
- The Town of Caledon Official Plan (2024),
- TRCA Open Data (2024),
- CVC Authority Open Data (2024),
- The Ministry of Natural Resources Natural Heritage Information Centre database (Ministry of Natural Resources, 2024a),
- Aquatic Resources Area database (Ministry of Natural Resources, 2025b),
- Ontario Breeding Bird Atlas (Bird Studies Canada, 2021),
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019),
- Ontario Butterfly Atlas (Toronto Entomologists' Association, 2024),
- Ebird (2024),
- iNaturalist (2024),

4. As of July 2024, the Region's Official Plan was no longer in effect, however, it was used for context purposes in support of this study.

- Fisheries and Oceans Canada Species at Risk mapping (Fisheries and Oceans Canada, 2025), and
- Ministry of Environment, Conservation and Parks species range maps (Ministry of Environment, Conservation and Parks, 2019).

The results of the desktop review indicated that there were Provincially Significant Wetlands and Environmentally Sensitive Areas within the Study Area. No Areas of Natural and Scientific Interest were identified within 120 metres of each alternative route. Other key considerations of the natural environment evaluation for each alternative route are outlined below and detailed in **Appendix K: Short-list Route Evaluation Matrices.**

5.6.1.1 Aquatic Resources

Evaluation Criteria: Potential effects on water resources

Alternative Route S1: Kennedy Road/Bovaird Drive to McLaughlin Road

A total of five fish-bearing watercourses were identified within 120 metres of Route S1:

- This Route crossed Etobicoke Creek, a warmwater feature within the jurisdiction of TRCA, in two locations – first at the southern end of Kennedy Road and again along Bovaird Drive East, just east of Main Street.
- Two watercourses at Bovaird Drive West and the OBR, tributaries to Fletchers Creek, had coolwater thermal regimes within the jurisdiction of CVC.
- Fletchers Creek at Bovaird Drive West, east of McLaughlin Road, had a coolwater thermal regime within the jurisdiction of CVC.
  - Fletchers Creek was identified in Fisheries and Oceans Canada Species as Risk mapping as Redside Dace (*Clinostomus elongatus*) Critical Habitat (Fisheries and Oceans Canada, 2025).

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

A total of eight fish-bearing watercourses were identified within 120 metres of Route S2, some of which cross the route multiple times.

- As in Route S1, this route crossed Etobicoke Creek, a warmwater feature within the jurisdiction of TRCA, at two locations. The first crossing was located at the southern end of Kennedy Road and the second crossing was at Vodden Street, east of Main Street.
- The watercourses along Route S2 between Vodden Street and Bovaird Road West were tributaries to Fletchers Creek with coolwater thermal regimes within the jurisdiction of CVC.

- Fletchers Creek at Bovaird Drive West, east of McLaughlin Road, had a coolwater thermal regime within the jurisdiction of CVC.
  - Fletchers Creek was identified in Fisheries and Oceans Canada Species as Risk mapping as Redside Dace Critical Habitat (Fisheries and Oceans Canada, 2025).

Summary of Potential Effects on Water Resources for Southern Routes:

Route S1 is preferred as it has three fewer fish-bearing watercourses, and less groundwater management compared to Route S2. This Route has the potential to negatively impact Fletchers Creek which is a Redside Dace Critical Habitat at Bovaird Drive West, west of McLaughlin Road.

Route S2 has three more fish bearing watercourses, and slightly more groundwater management compared to Route S1. This Route has the potential to negatively impact Fletchers Creek which is a Redside Dace Critical Habitat at Bovaird Drive West, west of McLaughlin Road.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

A total of nine fish-bearing watercourses were identified within 120 metres of Route N1. From Bovaird Drive to north of Mayfield Road, the boundary between TRCA and CVC crossed back and forth along the Route.

- All watercourses from Bovaird Drive to north of Mayfield Road fell within the jurisdiction of CVC and were tributaries to Fletchers Creek with coolwater thermal regimes.
- From north of Mayfield Road, including Old School Road along Route N1, all watercourses were headwater features of Etobicoke Creek with warmwater thermal regimes within the jurisdiction of TRCA.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

A total of 19 fish-bearing watercourses were identified within 120 metres of Route N2.

- From Bovaird Drive West to north of Tim Manley Avenue along Route N2, all watercourses (Fletchers Creek and its tributaries) had coolwater thermal regimes and were within the jurisdiction of CVC.
  - Fletchers Creek was identified in Fisheries and Oceans Canada Species as Risk mapping as Redside Dace Critical Habitat (Fisheries and Oceans Canada, 2025). This feature flowed parallel to McLaughlin Road for approximately 1.6 kilometres within 120 metres of Route N2.

- From north of Tim Manley Avenue along Route N2, including Old School Road, all watercourses were headwater features of Etobicoke Creek with warmwater thermal regimes within the jurisdiction of TRCA.

Summary of Potential Effects on Water Resources for Northern Routes:

Route N1 has 10 fewer fish-bearing watercourses, and less groundwater management complexity compared to Route N2.

Route N2 has 10 more fish-bearing watercourses, and more groundwater management complexity compared to Route N1 due to a portion of the Route running parallel to Fletchers Creek (Redside Dace [*Clinostomus elongatus*] Critical Habitat).

5.6.1.2 Terrestrial Features

Evaluation Criteria: Potential effects on terrestrial features.

Alternative Route S1: Kennedy Road/Bovaird Drive to McLaughlin Road

There were several natural heritage features, including woodlands and watercourses, located within 120 metres of Route S1. Natural heritage features along Route S1, south of the Steeles Avenue East and Kennedy Road intersection, as well as across Bovaird Drive between Kennedy Road South and Main Street North included sections of the Greenbelt - Urban River Valley along Etobicoke Creek, Wooded Area, and the City of Brampton Natural Heritage System including natural heritage restoration areas.

The following natural heritage features are located within 120 metres of the S1 Route and may be indirectly affected via trenchless methods:

- No provincially significant wetlands
- Ontario Greenbelt Urban River Valley: Two crossings
- Number of Woodlands: Five
- City of Brampton Natural Heritage System: Two crossings
- Candidate SWH: Bat Maternity Colony, Amphibian Breeding Habitat Woodland and several habitats for Species of Conservation Concern

The following natural heritage features are located along the S1 route that may be directly (i.e., loss of vegetation) or indirectly affected:

- No wetlands
- Number of Woodlands: Four
- City of Brampton NHS: Two
- Ontario Greenbelt Urban River Valley: Two

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

There were several natural heritage features, including woodlands and watercourses, located within 120 metres of the Route S2 that may be indirectly affected via trenchless methods. The natural heritage features located along this route were located south of the Steeles Avenue East and Kennedy Road intersection and intersected Vodden Street East between Centre Street North and Ken Williams Drive. The natural heritage features included sections of the Ontario Greenbelt – Urban River Valley, Wooded Areas, and the City of Brampton Natural Heritage System, including natural heritage restoration areas. There were no Provincially Significant Wetlands found within the 120 metre buffer or along the Route S2.

Summary of potential effects on terrestrial features for southern routes:

Minimal loss of vegetation or disruption to sensitive habitats is anticipated along both Route S1 and S2 as the majority of the route will be installed via trenchless methods, with direct impacts limited to exit and entrance shafts, which are largely outside of natural heritage features.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

There were several natural heritage features located within 120 metres of Route N1 that may be indirectly affected via trenchless methods. These included the Provincially Significant Etobicoke Creek Headwater Wetland Complex, woodlands, the City of Brampton Natural Heritage System, Ontario Greenbelt - Protected Countryside and Candidate Significant Wildlife Habitats. Additional designated areas found within 120 metres of the Route N1 included the Town of Caledon Environmental Policy Area along McLaughlin Road north of Mayfield Road and along Old School Road between McLaughlin Road and Hurontario Street. Portions of the Provincially Significant Etobicoke Creek Headwater Wetland Complex were located along the OBR east of McLaughlin Road and along the section of Old School Road which the Route N1 crossed at two separate locations. The following natural heritage features are located within 120 metres of the N1 Route:

- Etobicoke Creek Headwater Provincially Significant Wetland (PSW) Complex: Two crossings
- Number of Woodlands: Five
- City of Brampton Natural Heritage System (NHS): One crossing
- Town of Caledon Environmental Policy Area: Three crossings
- Greenbelt Protected Countryside: One crossing

- Candidate SWH: Bat Maternity Colony, Waterfowl Nesting Area, Turtle Nesting Area, Seeps and Springs, Amphibian Breeding Habitat Woodland and Wetland, Marsh Breeding Bird Habitat and several habitats for Species of Conservation Concern

The Route was in a primarily developed urban area or agricultural fields and no disturbance, such as tree removal, to the natural heritage features is anticipated as entry and exit shafts are located outside of these natural heritage features.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

There were several natural heritage features located within 120 metres of Route N2 that may be indirectly affected via trenchless methods. The features included the Provincially Significant Etobicoke Creek Headwater Wetland Complex, woodlands, the City of Brampton Natural Heritage System, Ontario Greenbelt - Protected Countryside and Candidate Significant Wildlife Habitats. Additional designated areas found within 120 metres of the Route N2 included the Town of Caledon Environmental Policy Area along McLaughlin Road north of Mayfield Road and along Old School Road between McLaughlin Road and Hurontario Street. Portions of the Provincially Significant Etobicoke Creek Headwater Wetland Complex were located along McLaughlin Road and along the section of Old School Road which Route N2 crossed at three separate locations. The following natural heritage features are located within 120 metres of the N2 Route:

- Etobicoke Creek Headwater PSW Complex: Three crossings
- Number of Woodlands: Three
- City of Brampton NHS: One crossing
- Town of Caledon Environmental Policy Area: Four crossings
- Greenbelt Protected Countryside: One crossing
- Candidate SWH: Bat Maternity Colony, Waterfowl Nesting Area, Turtle Nesting Area, Seeps and Springs, Amphibian Breeding Habitat Woodland and Wetland, Marsh Breeding Bird Habitat and several habitats for Species of Conservation Concern

Overall, the route was in a primarily developed urban area or agricultural fields, and no disturbance to the natural heritage features, such as tree removal, is anticipated as entry and exit shafts are located outside of these natural heritage features.

Summary of Potential Effects on Terrestrial Features for Northern Routes:

Minimal loss of vegetation or disruption to sensitive habitats is anticipated along Route N1 as the majority of the Route will be installed via trenchless methods. Route N1

crosses the Provincially Significant Wetland at two locations, whereas Route N2 crosses the Provincially Significant Wetland at three locations. However, direct impacts are limited to exit and entrance shafts, which are outside of the Provincially Significant Wetland.

5.6.1.3 Species at Risk

Evaluation Criteria: Potential effects on Species at Risk and Species at Risk Habitat

Alternative Route S1: Kennedy Road/Bovaird Drive to McLaughlin Road

Background review records indicated the presence of 12 Species at Risk in addition to several Candidate Significant Wildlife Habitat with the potential to occur within 120 metres of the Route S1. The 12 Species at Risk included Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), Tri-coloured Bat (*Perimyotis subflavus*), Hoary Bat (*Lasiurus cinereus*), Silver-haired Bat (*Lasionycteris noctivagans*), Eastern Red Bat (*Lasiurus borealis*), Chimney Swift (*Chaetura pelagica*), Red-headed Woodpecker (*Melanerpes erythrocephalus*), Butternut (*Juglans cinerea*), Black Ash (*Fraxinus nigra*), and Redside Dace. The following Candidate Significant Wildlife Habitats may occur within the Study Area and will be verified in the field: Bat Maternity Colony, Amphibian Breeding Habitat Woodland and several habitats for Species of Conservation Concern. The Route was in a primarily developed, urban area; however, disturbance may occur within the treed valleyland of Etobicoke Creek Valley if trees are removed from the woodlots. Natural heritage features found directly along the Route S1 that have a greater potential to be affected include the City of Brampton Natural Heritage System, Ontario Greenbelt Urban River Valley and woodlands.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

Background review records indicated the presence of 12 Species at Risk in addition to several Candidate Significant Wildlife Habitat with the potential to occur within 120 metres of the Route S2. The 12 Species at Risk species included Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Hoary Bat, Silver-haired Bat, Eastern Red Bat, Chimney Swift, Red-headed Woodpecker, Butternut, Black Ash, and Redside Dace. The potential Significant Wildlife Habitat identified were Bat Maternity Colony, Amphibian Breeding Habitat Woodland and several habitats for Species of Conservation Concern. The route was in a primarily developed, urban area; however, disturbance may occur within the treed valleyland of Etobicoke Creek Valley if trees are removed from the woodlots. Natural heritage features found directly along the route and have a greater potential to be affected include the City of Brampton Natural Heritage System, Ontario Greenbelt Urban River Valley and woodlands.

Summary of Potential Effects on Species at Risk and Species at Risk Habitat for Southern Routes:

Similar impacts on Species At Risk and Species At Risk habitat for both Routes S1 and S2.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

Background review records indicated the presence of 14 Species at Risk in addition to several candidate Significant Wildlife Habitat with the potential to occur within 120 metres of the Route N1. The 14 Species at Risk included Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Hoary Bat, Silver-haired Bat, Eastern Red Bat, Bobolink (*Dolichonyx oryzivorus*), Chimney Swift, Eastern Meadowlark (*Sturnella magna*), Red-headed Woodpecker, Butternut, Black Ash, and Jefferson Salamander (*Ambystoma jeffersonianum*). Two Species at Risk species, Bobolink and Eastern Meadowlark, have the potential to be directly or indirectly affected as their habitats, hayfield and pastures, may be present along the Route and was verified in the field during the windshield surveys. The candidate Significant Wildlife Habitat identified were Bat Maternity Colony, Waterfowl Nesting Area, Turtle Nesting Area, Seeps and Springs, Amphibian Breeding Habitat Woodland and Wetland, Marsh Breeding Bird Habitat and several habitats for Species of Conservation Concern.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

Background review records indicated the presence of 15 Species at Risk in addition to several candidate Significant Wildlife Habitat with the potential to occur within 120 metres of the Route N2. The 15 Species at Risk Species included Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Hoary Bat, Silver-haired Bat, Eastern Red Bat, Bobolink, Chimney Swift, Eastern Meadowlark, Red-headed Woodpecker, Butternut, Black Ash, Jefferson Salamander and Redside Dace. Three Species at Risk species including, Redside Dace, Bobolink and Eastern Meadowlark, have the potential to be directly or indirectly affected as their habitats such as watercourses for Redside Dace and hayfields and pastures for Bobolink and Eastern Meadowlark may be present along the Route and will be verified in the field during the windshield surveys. The candidate Significant Wildlife Habitats identified were Bat Maternity Colony, Waterfowl Nesting Area, Turtle Nesting Area, Seeps and Springs, Amphibian Breeding Habitat Woodland and Wetland, Marsh Breeding Bird Habitat and several habitats for Species of Conservation Concern.

Summary of Potential Effects on Species at Risk and Species at Risk Habitat for Northern Routes:

Similar impacts on Species at Risk and Species at Risk habitat for both Routes S1 and S2.

5.6.1.4 Soil and Groundwater

Evaluation Criteria: Potential effects on soil and groundwater

Alternative Route S1: Kennedy Road/Bovaird Drive to McLaughlin Road

Route S1 was not subject to a Phase 2 Environmental Site Assessment. It is assumed that there is lower potential for soil contaminants and groundwater quality (e.g., risk of potential for off-site adverse effects relative to any migration of several parameters via groundwater transport is considered low) compared to Route S2 and will be confirmed through additional investigation DDRA focussed on shaft compounds in Phase 3).

The COS (**Appendix C3**) identified several PCAs and APECs (e.g., autobody and/or auto service garages, gasoline service stations) along Kennedy Road route section. That said, soil contamination mitigation strategies will address any risks with contaminated soil and groundwater.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

The COS identified several PCAs and APECs (e.g., autobody and/or auto service garages, gasoline service stations) along Kennedy Road route section.

The collected soil samples (WSP Phase 2 Environmental Site Assessment) within OBR (Vodden Street to Bovaird Drive) do not meet applicable MECP Table 1 Site Conditions for several contaminants including Polycyclic Aromatic Hydrocarbons and Petroleum Hydrocarbons among others - Applies to OBR shaft compounds (requires additional evaluation through DDRA). This will be an issue at the shaft sites.

There is a known risk of soil and groundwater contamination at shaft and compound locations which can be mitigated using soil management and stormwater management techniques and will requires additional evaluation through DDRA focused on shaft compounds).

The remainder of route (i.e., Kennedy Road) was not subject to Phase 2 ESA –lower potential for soil contaminants and groundwater quality - risk potential for off-site adverse effects relative to any migration of several parameters via groundwater transport is considered lower, compared to portion along OBR (will be confirmed through additional investigation DDRA focussed on shaft compounds in the preliminary and detailed design phase). Soil contamination mitigation strategies will address any risks with contaminated soil and groundwater.

Summary of Potential Effects on Soil and Groundwater for Southern Routes:

From a soil and groundwater contamination perspective, Route S1 is preferred as it has less areas of potential contamination in comparison to the OBR corridor from Vodden Street to Bovaird Drive.

Route S2 is less preferred as it uses the OBR corridor from Vodden Street to Bovaird Drive which will require more rigorous measures to address soil and groundwater contamination compared to Route S1.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

Route N1 was subject to Phase 2 Environmental Site Assessment whereby collected soil samples within OBR do not meet applicable Ministry of Environment Conservation and Parks' Table 1 Site Conditions for several contaminants including Polycyclic Aromatic Hydrocarbons and Petroleum Hydrocarbons among others - Applies to OBR shaft compounds (requires additional evaluation through Due Diligence Risk Assessment).

Regarding shallow groundwater quality - risk potential for off-site adverse effects relative to any migration of several parameters via groundwater transport is considered low - applies to OBR shaft compounds.

Soil contamination mitigation strategies will address any risks with contaminated soil and groundwater.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

Route N1 was not subject to Phase 2 Environmental Site Assessment. It is assumed that there is low potential for soil contaminants and groundwater quality - risk potential for off-site adverse effects relative to any migration of several parameters via groundwater transport is considered low, compared to Route N1. That said, soil contamination mitigation strategies will address any risks with contaminated soil and groundwater.

Summary of Potential Effects on Soil and Groundwater for Northern Routes:

From a soil and groundwater contamination perspective, Route N1 is less preferred as it uses the Orangeville Bampton Railway corridor from Bovaird Drive to Old School Road which will require additional studies and measures to address soil and groundwater contamination compared to Route N1.

From a soil and groundwater contamination perspective, Route N2 is preferred as it avoids the Orangeville Bampton Railway corridor from Bovaird Drive to Old School Road.

5.6.1.5 Overall Natural Environmental Evaluation Summary

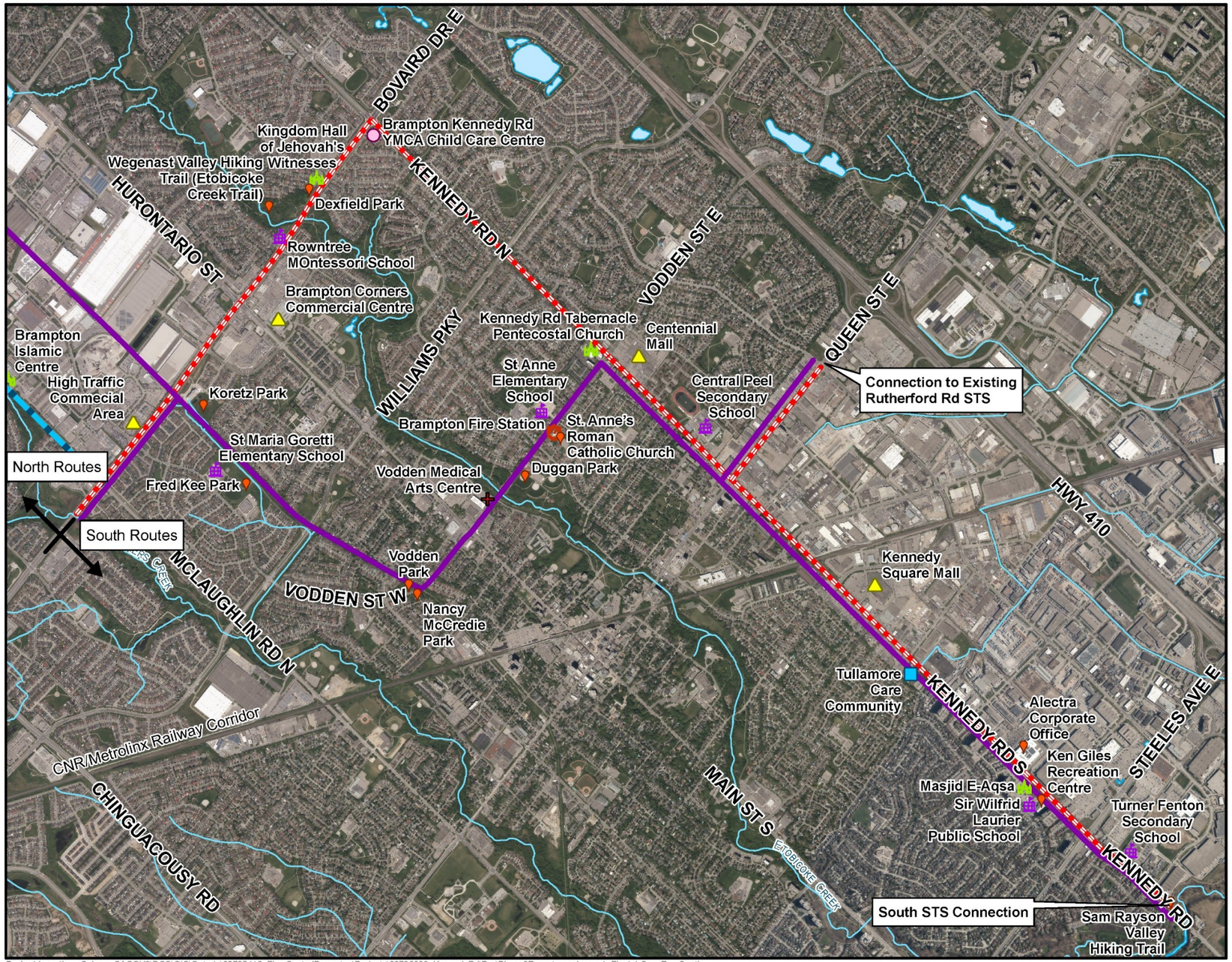
Preferred South Alternative Route:	From the completed analysis of the overall natural heritage features Route S1 is preferred from overall Natural Environment perspective.
Preferred North Alternative Route:	Both N1 and N2 Routes score similar from overall Natural Environment perspective.

5.6.2 Socio-economic Evaluation

As part of this MCEA study, an evaluation of the socio-economic aspects associated with each of the alternative sanitary sewer routes was completed. To identify key socio-economic considerations and potential constraints associated with each alternative route, AECOM staff reviewed a variety of existing background documents and information sources, including:

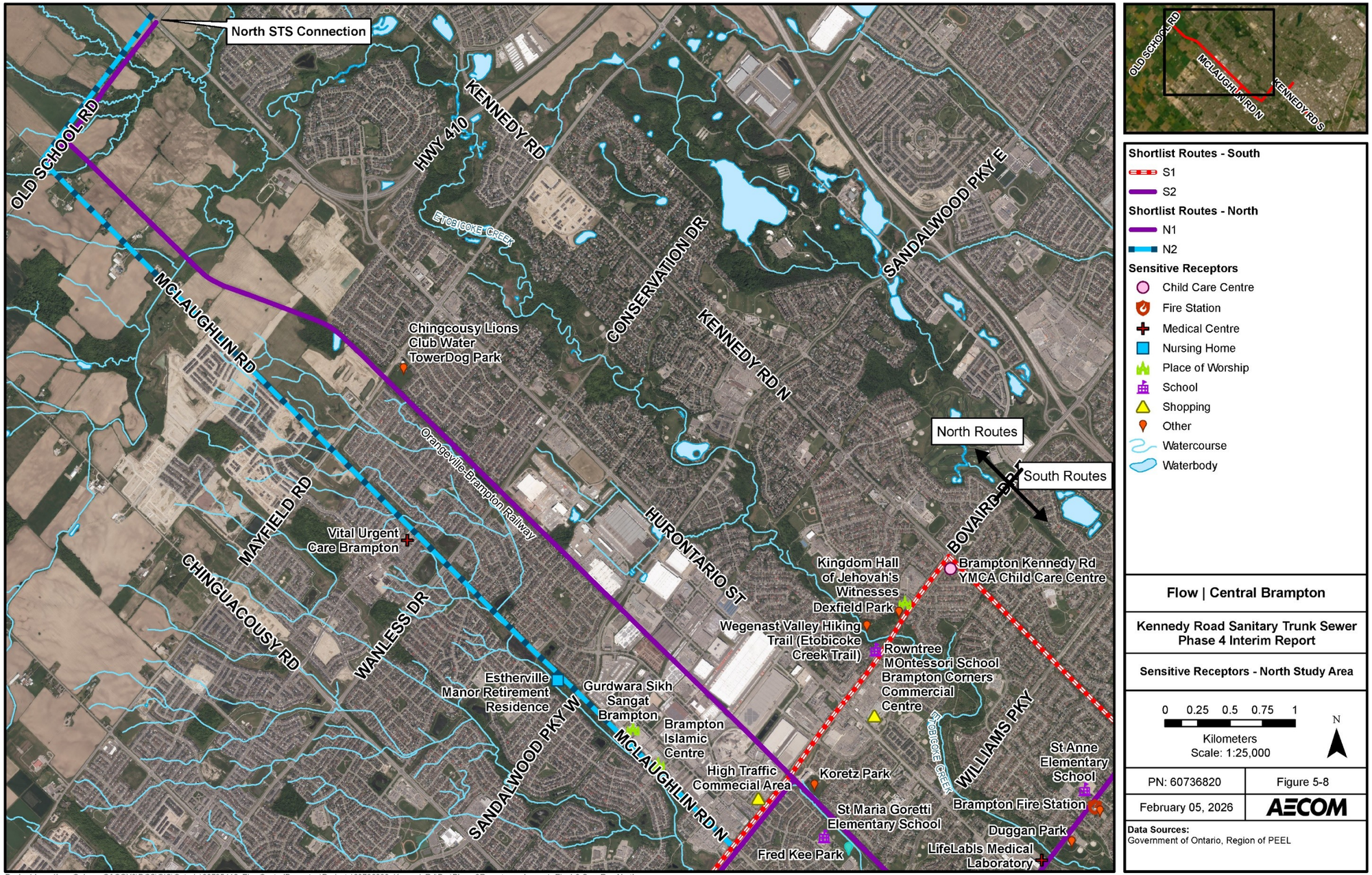
- GIS mapping and ortho-imagery provided by the Peel Region;
- Sensitive receptors mapping for south and north study area sections (refer to **Figure 5-7** and **Figure 5-8**)
- Region of Peel Official Plan Schedule E-5, Major Transit Station Areas
- Region of Peel Official Plan Schedule F-1, Rapid Transit Corridors
- Region of Peel Official Plan Schedule F-2, Major Road Network,
- Region of Peel Official Plan Schedule F-3, Regional Road Mid-Block Right of Way Requirements,
- Region of Peel Official Plan Figure 13, Existing and Long-Term Regional Road Cycling Network
- Region of Peel Official Plan Figure 14, Existing Regional Road Pedestrian Network
- Region of Peel Official Plan Figure 16, Regional Goods Movement Corridors
- Region of Peel Water and Wastewater Master Plan for the Lake Based System 2020, Volume 2 (of 5): Background and Planning Context
- Schedule 'C' Municipal Class EA Assessment: Etobicoke Creek Trunk Sewer Improvements and Upgrades (Jacobs, 2023)
- City of Brampton Official Plan Schedule 1B, Major Transit Station Areas (supported by Schedules 13b, 13d, 13e, 13f, 13l and 13m)
- City of Brampton Official Plan Schedule 3A, Active Transportation Network
- City of Brampton Official Plan Schedule 3B, Transit Network to 2051
- City of Brampton Official Plan Schedule 3C, Streets Network to 2051
- City of Brampton Official Plan Schedule 4, City Road Right-of-Way Widths
- City of Brampton 2022 Cycling Map
- Town of Caledon Official Plan Schedule J Road Classification and Schedule K (Right of Way width)

Figure 5-7: Sensitive Receptors – South Study Area



Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Projects\60736820_KennedyRd\Pro\Phase2Report.aprx **Layout:** Fig 4-1 SensRec South
Date Saved: February 09, 2026 **User:** SaigeonJ

Figure 5-8: Sensitive Receptors – North Study Area



Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Projects\60736820_KennedyRd\Pro\Phase2Report.aprx **Layout:** Fig 4-2 SensRec North
Date Saved: February 04, 2026 **User:** SaigeonJ

In conjunction with a review of the secondary sources outlined above, the alternative short-list routing options were comparatively evaluated from a socio-economic perspective based on the potential for temporary disruption to residences, institutions, recreational areas and businesses during construction, expected traffic impacts during construction, including lane closures.

There are several anticipated traffic and active transportation impacts during construction. Disruptions to services and facilities may include temporary closures of vehicle lanes, sidewalks, trails, and bike lanes. To evaluate these impacts, the alternatives were compared by considering the number of available travel lanes under existing conditions and the expected number/direction/duration of open lanes during construction. A qualitative comparison of the level of service with lane closures in place was also conducted. Additionally, the number of intersecting roads and potential opportunities to enhance active transportation were considered.

Construction activities have the potential to impact public transit services, requiring the relocation of bus shelters and transit stops, and/or temporarily interrupting services. Routes with higher order transit services were considered more disruptive than routes with local transit services.

5.6.2.1 Impacts on Sensitive Receptors

Evaluation Criteria: Number of potentially impacted sensitive receptors during construction and potential for reduced property access and potential business losses related to customers avoiding trips to high traffic commercial areas

Alternative Route S1: Kennedy Road/Bovaird Drive to McLaughlin Road

Notable sensitive receptors along Route S1 include:

- Temporary disruption to Sam Rayson Valley Hiking Trail (Etobicoke Creek Trail) access
- Turner Fenton Secondary School (7935 Kennedy Road South)
- Ken Giles Recreation Centre (370 Bartley Bull Parkway)
- Masjid E-Aqsa – Place of Worship (30 Rambler Drive)
- Sir Wilfrid Laurier Public School (364 Bartley Bull Parkway)
- Alectra Corporate Office and Works Yard (200 Kennedy Road South)
- Nursing Home: Tullamore Care Community (133 Kennedy Road South)
- Kennedy Square Mall (50 Kennedy Road South)
- Central Peel Secondary School (32 Kennedy Road North)
- Centennial Mall (227 Vodden Street East)
- Kennedy Road Tabernacle Pentecostal Church (141 Kennedy Road North)

- Brampton Kennedy Road YMCA Child Care Centre (9996 Kennedy Road North)
- Kingdom Hall of Jehovah's Witnesses (360 Conestoga Drive)
- Dexfield Park (address not available)
- Temporary disruption to Wegenast Valley Hiking Trail (Etobicoke Creek Trail) access
- Rowntree Montessori School (3 Sunforest Drive)
- Brampton Corners Commercial Centre (52 Quarry Edge Drive)

Alternative Route S2: Kennedy Road/Vodden Street/Orangeville Railway Corridor

Notable sensitive receptors along Route S2 include:

- Temporary disruption to Sam Rayson Valley Hiking Trail (Etobicoke Creek Trail) access
- Turner Fenton Secondary School (7935 Kennedy Road South
- Ken Giles Recreation Centre (370 Bartley Bull Parkway),
- Masjid E-Aqsa (30 Rambler Drive)
- Sir Wilfrid Laurier Public School (364 Bartley Bull Parkway)
- Alectra Corporate Office and Works Yard (200 Kennedy Road South)
- Nursing Home: Tullamore Care Community (133 Kennedy Road South)
- Kennedy Square Mall (50 Kennedy Road South)
- Central Peel Secondary School (32 Kennedy Road North)
- Centennial Mall (227 Vodden Street East)
- St. Anne Elementary School (124 Vodden Street East)
- St. Anne's Roman Catholic Church (115 Vodden Street East)
- Brampton Fire Station 207 (75 Vodden Street East)
- Duggan Park (75 Vodden Street East)
- Vodden Medical Arts Centre (36 Vodden Street East,)
- Vodden Park (96 Vodden Street West)
- Nancy McCredie Park playground (91 Vodden Street West)
- Fred Kee Park (95 Royal Orchard Drive)
- St Maria Goretti Elementary School (121 Royal Orchard Drive)

Refer to **Figure 5-7** for sensitive receptors along Route S1 and S2.

Summary of Potentially Impacted Sensitive Receptors during Construction for Southern Routes:

Same number of sensitive receptors (19) are impacted along both Routes S1 and S2, however, Route S2 is preferred as there are anticipated potential impacts to Brampton Corners Commercial Centre around Bovaird Drive and Hurontario Street and potential business losses related to customers avoiding trips to high traffic commercial areas along Route S1.

Common to both Routes is the Kennedy Square Mall which may experience potential business losses.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

Notable sensitive receptors along Route N1 include:

- Chinguacousy Lions Club Water Tower Dog Park (2789 Mayfield Road)
- Burnt Elm Park (45 Burnt Elm Drive)
- Burnt Elm Public School (85 Burnt Elm Drive)

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

Notable sensitive receptors along Route N2 include:

- High traffic retail area north of Bovaird Drive
- Brampton Islamic Centre (6 Lowry Drive)
- Gurdwara Sikh Sangat Brampton (32 Regan Road)
- Nursing Home: Estherville Manor Retirement Residence (10606 McLaughlin Road North)
- Vital Urgent Care Brampton North (695 Remembrance Road, Unit 103)

Refer to **Figure 5-8** for sensitive receptors along Route N1 and N2.

Summary of Potentially Impacted Sensitive Receptors during Construction for Northern Routes:

Based on the above, more sensitive receptors are impacted along Route N2 and therefore Route N1 is preferred.

5.6.2.2 Traffic and Active Transportation

Evaluation Criteria: Traffic and active transportation impacts during construction, including expected lane, sidewalk, trails, and bike lane closures

Alternative Route S1: Kennedy Road/Bovaird Drive to McLaughlin Road

Route S1, impacts vehicle traffic along both Kennedy Road and Bovaird Drive; both roadways have high traffic volumes. This route impacts vehicle traffic for a longer segment along Kennedy Road, a 4-lane Major Arterial City/Regional roadway, in comparison with Route S2. It is anticipated that during construction there will be 2-lane closures on Kennedy Road and similarly 2 lane closures on Bovaird Drive to accommodate construction activities. These closures will centre around the shaft compounds and move through the corridor as construction progresses (note that construction staging has not yet been developed so it is not yet known how many locations within the corridor(s) will be under construction at the same time).

The identified preliminary shaft locations potentially impact 3 crossing roads where Route S1 intersects Regional or City roadways, including:

- Bovaird Drive - a 6-lane Major Arterial Roads (Regional) and Züm Rapid Transit corridor
- Main Street – a 4-lane Major Arterial Roads (City) and Züm Rapid Transit corridor
- Williams Parkway – a 4-lane Minor Arterial Road (City) and Brampton Transit corridor

Route S1 will potentially increase delay at an additional five crossing roads where Route S1 intersects City roadways in different locations than Route S2. Access from other crossing roads to Kennedy Road will also be impacted by lane closures on Kennedy Road, including Rutherford Road and Linkdale Road. Access from other crossing roads to Bovaird Drive will also be impacted by lane closure on Bovaird Drive, including: Conestoga Road, Sunforest Drive/YellowBrick Road, and Gillingham Drive.

Kennedy Road and Bovaird Drive are both truck routes, and truck turning movements will need to be accommodated.

It is assumed that along the Route S1 corridor there is limited opportunity to enhance active transportation. It was confirmed that there are currently sidewalks on both sides of Kennedy Road throughout the Route S1 corridor (extending from Etobicoke Creek to north of Sandalwood Parkway). As per the Peel Region Official Plan Figure 14, Existing Regional Road Pedestrian Network, the following facilities are planned or in place:

- Kennedy Road (generally has sidewalks on both sides between Steeles Avenue and Bovaird Drive)
- Bovaird Drive (sidewalks on both sides between Kennedy Road and McLaughlin Road)

The Region's Official Plan, Figure 13, Existing and Long-Term Regional Road Cycling Network, identifies that Route S1 along Kennedy Road between Steeles Avenue and Bovaird Drive does not have planned cycling infrastructure. Both the Regional Official Plan and the City of Brampton's 2022 Cycling Map identified multi-use path for cyclists along Bovaird Drive.

Within the Study Area there is the Etobicoke Creek Recreation Trail, a paved trail following the Etobicoke Creek from the south end of the Study Area to the north end. This is a shared trail between pedestrians and cyclists. There are also several paved and unpaved trails through parks shared by cyclists and pedestrians in the Study Area. Overall, there are limited opportunity for active transportation enhancements on Route S1.

With respect to transit services and facilities, Route S1 impacts the Bovaird Drive, Main Street, and Queen Street Rapid Transit Corridors. Route S1 also impacts a longer section of the Kennedy Road transit corridor, most likely requiring two more locations for potential bus shelter/transit stop relocation along Kennedy Road (i.e., Williams Parkway and Bovaird Drive), compared to Alternative Route S2. Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive).

Alternative Route S2: Kennedy Road/Vodden Street/Orangeville Railway Corridor

Route S2, impacts vehicle traffic along both Kennedy Road and Vodden Street; it is anticipated that Kennedy Road, a 4-lane Major Arterial City/Regional roadway, has higher traffic volumes than Vodden Street, a 2-lane Collector Roadway (City road), and that in comparison to Route S1, Bovaird Drive would have higher traffic volumes than Vodden Street. This route impacts vehicle traffic for a shorter segment along Kennedy Road in comparison with Route S1.

Use of the OBR corridor alignment avoids or minimizes lane closures in comparison to Route S1. It is anticipated that during construction there will be 2-lane closures on Kennedy Road and a 1-lane closure on Vodden Street, as there are only two lanes on Vodden Street, to accommodate construction activities. These closures will move through the corridor as construction progresses (note that construction staging has not yet been developed so it is not yet known how many locations within the corridor(s) will be under construction at the same time).

The identified preliminary shaft locations potentially impact 1 crossing road where Route S2 intersects a City roadway:

- Willams Parkway Williams – a 4-lane Minor Arterial Road (City) and Brampton Transit corridor.

Route S2 will potentially increase delay at an additional 9 crossing roads where it intersects City roadways in different locations than Route S1. Access from other crossing roads to Vodden Street will also be impacted by lane closures on Vodden Street,

including Main Street, a 4-lane Major Arterial Road (City Road) and Rapid Transit Corridor. Access from other crossing roads to Vodden Street will also be impacted by lane closure on Vodden Street including: Post Road, Centre Street, Garfield Crescent, Vodden Court/Cumberland Drive, Cheryl Court, Isabella Street, Blossom Avenue, Mill Street/Rosebud Avenue.

There is potential opportunity to enhance active transportation related to future OBR multi use trail that is not present with Route S1. It was confirmed that there are currently sidewalks on both sides of Kennedy Road throughout the Route S2 corridor (extending from Etobicoke Creek to north of Sandalwood Parkway). As per the Peel Region Official Plan Figure 14, Existing Regional Road Pedestrian Network, the following facilities are planned or in place:

- Kennedy Road (generally has sidewalks on both sides between Steeles Avenue and Bovaird Drive)

The Region's Official Plan, Figure 13, Existing and Long-Term Regional Road Cycling Network, identifies that Route S2 along Kennedy Road between Steeles Avenue and Vodden Street does not have planned cycling infrastructure. There is an existing on-road cycling lane on both sides of Vodden Street along Route S2 as part of the recently implemented Brampton East-West Cycling Corridor Project.

Within the Study Area there is the Etobicoke Creek Recreation Trail, a paved trail following the Etobicoke Creek from the south end of the Study Area to the north end. This is a shared trail between pedestrians and cyclists. There are also several paved and unpaved trails through parks shared by cyclists and pedestrians in the Study Area.

With respect to transit services and facilities, Route S2 impacts the Vodden Street and Kennedy Road Brampton Transit Corridors and potentially introduces delay to the Main Street (Züm) Rapid and Brampton Transit Corridor where Route S2 crosses this corridor. These impacts may be less than Route S1 which impacts higher order rapid transit (Züm) corridors. Route S1 impacts a longer section of the Kennedy Road transit corridor most likely with two more locations for potential bus shelter/transit stop relocation along Kennedy Road (i.e., Williams Parkway and Bovaird Drive) compared to Alternative Route S2. However, while there are still potential relocations of bus shelters and transit stops along Kennedy Road and Vodden Street, Route S2 avoids relocation of bus shelters and transit stops along the OBR portion of the route (i.e., fewer relocations required compared to Route S1).

Summary of Traffic and Active Transportation Impacts for Southern Routes:

From a traffic and active transportation perspective, Route S1 is less preferred as there are more traffic impacts related to higher traffic volumes and anticipated 2-lane closures on Kennedy Road and Bovaird Drive and limited opportunities to enhance active transportation.

Route S2 is preferred as there are fewer lane closures anticipated along this route (2-lane closures on Kennedy Road and 1-lane closure on Vodden Street). There are also more opportunities to enhance active transportation related to future OBR multi use trail.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

Route N1 follows the OBR alignment, and as such avoids most lane closures, greatly minimizing impacts compared to Route N2 as there is no vehicle traffic in the OBR alignment. It is recognized that the OBR Route N1 may result in displacement of some pedestrian traffic currently using the OBR corridor during construction. With the potential for significant enhancement of active transportation facilities (i.e., a future OBR multi-use trail within the OBR corridor), in conjunction with construction of the STS, the temporary displacement to accommodate construction activities may be more acceptable to the public in comparison to adopting Route N2 and still displacing pedestrians to complete active transportation facilities in the OBR corridor.

Route N1 impacts a shorter segment of vehicle traffic along Old School Road compared with Route N2. During construction there may be 1-lane closure on all roads that intersect with the OBR corridor, depending on shaft locations, including at Bovaird Drive/Range Road 107, Sandalwood Parkway, Wanless Drive, Mayfield Road, and Old School Road. These closures will move through the corridor as construction progresses (note that construction staging has not yet been developed so it is not yet known how many locations within the corridor(s) will be under construction at the same time).

The identified preliminary shaft locations potentially impact five crossing roads where Route N1 intersects Regional or City roadways, including:

- Bovaird Drive – a 6-lane Major Arterial Roads (Regional) and Züm Rapid Transit corridor
- Mayfield Road – a 2-lane Major Arterial Roads (Regional) (not currently a transit corridor)
- Sandalwood Parkway – a 4-lane divided Major Arterial Road (City) and Brampton Transit corridor
- Wanless Drive – a 4 lane Minor Arterial Road (City) and Brampton Transit corridor
- Old School Road – a 2-lane Collector Road

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

Route N2, impacts vehicle traffic along McLaughlin Road, Old School Road (a longer segment in comparison with Route N1), and Bovaird Drive (from the McLaughlin Road to the OBR Corridor, where this route differs from Route N1). Along McLaughlin Road

there are traffic/transit and pedestrian/cyclist impact throughout. McLaughlin Road is a 4-lane Minor Arterial Road north of Bovaird Drive to south of Mayfield Road and a 2-lane Minor Arterial Road from south of Mayfield Road to Old School Road. McLaughlin Road is also Brampton Transit corridor.

It is anticipated that during construction there will be 2-lane closures on McLaughlin Road, and a 1-lane closures on Old School Road. These closures will move through the corridor as construction progresses (note that construction staging has not yet been developed so it is not yet known how many locations within the corridor(s) will be under construction at the same time).

The identified preliminary shaft locations potentially impact 5 crossing roads where Route N1 intersects Regional or City/Town roadways, including:

- Bovaird Drive – a 6-lane Major Arterial Roads (Regional) and Züm Rapid Transit corridor
- Wanless Drive – a 4 lane Minor Arterial Road (City) and Brampton transit corridor
- Old School Road – a 2-lane Collector Road
- Potters Wheel Gate – a local road
- Lormel Gate/Lowry Drive – a local road

Route N2 will potentially increase delay at an additional 7 crossing roads where McLaughlin Road intersects other roadways in different locations than Route N1., including: Marycroft Court, Sandalwood Parkway, Narcissus Gate, Bramtrail Gate, Whitepoppy Drive, Madawaska Road, and Tweechill Avenue

It is assumed that along the Route N2 route corridor there is limited opportunity to enhance active transportation. There are existing sidewalks or multi-use pathways on both sides of McLaughlin Road from Bovaird Drive to south of Mayfield Road, and from north of Mayfield Road to Tim Manley Avenue. There are no active transportation facilities on Old School Road.

Summary of Traffic and Active Transportation Impacts for Northern Routes:

Route N1 is preferred as it avoids major traffic impacts on roads with high traffic volumes and provides significant opportunity for enhancing active transportation.

Route N2 is less preferred as there are major traffic impacts on heavily travelled roads and minimal opportunity for enhancing active transportation.

5.6.2.3 Public Transit

Evaluation Criteria: Potential impacts on public transit during construction, (e.g., bus stop closure/relocation)

Alternative Route S1: Kennedy Road/Bovaird Drive to McLaughlin Road

Route S1 impacts higher order Rapid Transit Corridor on Bovaird Drive and Main Street/Hurontario Street. Route S1 also impacts higher order transit corridor on Kennedy Road (longer section impacted compared to S2). Lastly there is potential for relocation of bus shelters and transit stops along Kennedy Road (1 more location compared to Route S2).

Alternative Route S2: Kennedy Road/Vodden Street/Orangeville Railway Corridor

Route S2 impacts higher order transit corridor along Kennedy Road. Route S1 may also impact potential relocation of bus shelters and transit stops along Kennedy Road and Vodden Street and introduces delays to transit corridor at route crossing of Main Street at Vodden Street. However, Route S2 avoids relocation of transit infrastructure along the OBR corridor, where no existing transit stops.

Summary of Potential Impacts on Public Transit during Construction for Southern Routes:

Route S2 is preferred as it avoids impacts to higher order transit routes (e.g., Bovaird Drive) and may result in less impacts to bus shelters and transit stops.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

With respect to transit services and facilities, Route N1 avoids relocation of bus shelters and transit stops. It avoids most higher order transit routes but crosses 3 transit corridors and may introduce delays to transit services at these route/roadway crossings of the Orangeville- Brampton Railway corridor with Bovaird Drive, Sandalwood Parkway and Wanless Drive.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

With respect to transit services and facilities, Route N2 potentially introduces delays to transit routes along McLaughlin Road, Bovaird Drive and Wanless Drive and to the transit corridor where Route N2 crosses Sandalwood Parkway, introducing more impacts than that anticipated with Alternative Route N1. There are potential relocation of bus shelters and transit stops along McLaughlin Road, Bovaird Drive and Wanless Drive (Transit Corridors) with Route N2, introducing more impacts than that anticipated with Route N1.

Summary of Potential Impacts on Public Transit during Construction for Northern Routes:

Route N1 is preferred as it avoids impacts to public transit shelters, stops and service.

5.6.2.4 Agricultural Operations

Evaluation Criteria: Potential impacts on agricultural lands and operations

Alternative Routes S1 and S2

Both Routes S1 and S2 do not impact agricultural lands nor operations, as they are entirely within built up urban areas.

Summary of Potential Impacts on Agricultural Operations for Southern Routes:

Neither route has any impacts on agricultural lands or operations.

Alternative Routes N1 and N2

Lands north of Mayfield Road, within the Town of Caledon are prime agricultural land (defined as specialty crop areas and/or areas with Canada Land Inventory Classes 1-3 lands) and experience potential loss of some prime agricultural land related to shaft compound temporary easements.

The OBR corridor route segment from Mayfield Road North to Old School Road will require access from McLaughlin Road which may temporarily displace prime agricultural lands for the access road as well as disrupt agricultural operations. It is important to note that the entire area from Mayfield Road to Old School Road will eventually be completely urbanized with no agricultural operations as per "2051 New Urban Area" (Schedule E-1 of Peel Official Plan: Regional Structure, April 2022).

Conversely, McLaughlin Road to Mayfield Road to Old School Road avoids impacts to agricultural lands and operations.

The Old School Road alignment is generally common to both Route N1 and N2 and has similar impacts to agricultural lands and operations related to shaft compound siting outside of road right-of-way and within agricultural fields.

Summary of Potential Impacts on Agricultural Lands and Operations for Northern Routes:

Route N1 has more potential impacts due to potential loss of prime agricultural land related to temporary access from McLaughlin Road to OBR corridor. Note that agricultural operations will eventually be displaced by future urban development as per Region's Official Plan.

Route N2 is preferred as it avoids impacts to agricultural lands.

5.6.2.5 Overall Socio-economic Environmental Evaluation Summary

Preferred South Alternative Route: Route S2 is preferred from an overall Socio-economic Environment perspective.

Preferred North Alternative Route: Route N1 is preferred from an overall Socio-Economic Environment perspective.

5.6.3 Cultural Evaluation

5.6.3.1 Archaeological Resources

Evaluation Criteria: Potential for loss and/or disturbance to potential archaeological resources

Alternative Route S1: Kennedy Road/Bovaird Drive to McLaughlin Road

Based on a review of the historical, environmental, and archaeological context of the study area, AECOM's Stage 1 background study and subsequent field review have determined that the potential for the recovery of pre- and post-contact Indigenous and 19th century settler archaeological resources within the Study Area is high, based on the presence of the following features:

- Presence of seven registered archaeological sites within 1 kilometre;
- Presence of four registered archaeological site within 300 metres;
- Presence of one registered archaeological site within route buffers;
- Distance to various types of water sources (Fletchers Creek and Etobicoke Creek, and tributaries);
- Areas of early colonial settlement (Brampton);
- Presence of Graham East Cemetery/Graham West Cemetery along route; and,
- Early transportation routes (Kennedy Road, Queen Street, Credit Valley Railway, and Grand Trunk Railway).

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

Based on a review of the historical, environmental, and archaeological context of the study area, AECOM's Stage 1 background study and subsequent field review have determined that the potential for the recovery of pre- and post-contact Indigenous and 19th century settler archaeological resources within the study area is high, based on the presence of the following features:

- Presence of five registered archaeological sites within 1 kilometre;
- Distance to various types of water sources (Fletchers Creek and Etobicoke Creek, and tributaries);
- Areas of early colonial settlement (Brampton);

- Presence of Graham East Cemetery/Graham West Cemetery along route; and,
- Early transportation routes (Bovaird Drive, Credit Valley Railway, and Grand Trunk Railway).

Summary of Potential Loss of or Disturbance to Archaeological Resources for Southern Routes:

Both Routes S1 and S2 have similar impacts from an archaeological perspective due to the proximity to the Graham East/Graham West Cemetery.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

- Prescence of 36 registered archaeological sites within 1 kilometre;
- Presence of eight registered archaeological sites within 300 metres;
- Drumlinized landscape;
- Distance to various types of water sources (Fletchers Creek and Etobicoke Creek, and tributaries);
- Areas of early colonial settlement (Brampton, and Edmonton);
- Presence of five listed heritage properties along route and,
- Early transportation routes (Old School Road, Credit Valley Railway, and Grand Trunk Railway).

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

- Presence of 42 registered archaeological sites within 1 kilometre;
- Presence of 20 registered archaeological sites within 300 metres;
- Presence of four registered archaeological sites within route buffers;
- Drumlinized landscape;
- Distance to various types of water sources (Fletchers Creek and Etobicoke Creek, and tributaries);
- Areas of early colonial settlement (Brampton, and Edmonton);
- Presence of 10 listed heritage properties along route; and,
- Early transportation routes (McLaughlin Road, Old School Road, Credit Valley Railway, and Grand Trunk Railway).

Summary of Potential Loss of or Disturbance to Archaeological Resources for Northern Routes:

Both Routes N1 and N2 have similar impacts from an archaeological perspective.

5.6.3.2 Cultural and Built Heritage Resources

Evaluation Criteria: Potential effects on built heritage resources, and cultural heritage landscapes

Alternative Route S1: Kennedy Road/Bovaird Drive to McLaughlin Road

Based on a desktop review, the only known cultural heritage resource that is adjacent to Route S1 is Kennedy Valley (Listed). Since no structures are located within this cultural heritage resources, no indirect adverse impacts due to construction vibration are anticipated.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

Based on a desktop evaluation, the only known cultural heritage resource that is adjacent to Route S2 is the Ontario Heritage Plaque "The Dale Estate" in Duggan Park. Since no historical structures are located within the property, no indirect adverse impacts due to construction vibration are anticipated.

Summary of Potential Effects on Built Heritage Resources, and Cultural Heritage Landscapes for Southern Routes:

Both south short-listed routes score similarly from the perspective of potential impacts on cultural heritage resources.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

Based on a desktop evaluation, four known cultural heritage resources are located adjacent to Route N1. These properties have the potential to be indirectly adversely impacted by construction vibration. These four properties include:

- 12461 McLaughlin Road (Listed)
- 12711 McLaughlin Road (Listed)
- 12891 McLaughlin Road (Listed)
- 2939 Old School Road (Listed)

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

Based on a desktop evaluation, nine known cultural heritage resources are located adjacent to Route N1. These properties have the potential to be indirectly adversely impacted by construction vibration. These nine properties include:

- 12502 McLaughlin Road (Listed)
- 12461 McLaughlin Road (Listed)
- 12711 McLaughlin Road (Listed)
- 12700 McLaughlin Road (Listed)
- 12891 McLaughlin Road (Listed)
- 12900 McLaughlin Road (Listed)
- 12960 McLaughlin Road (Listed)
- 13064 McLaughlin Road (Listed)
- 2939 Old School Road (Listed)

Summary of Potential Effects on Built Heritage Resources, and Cultural Heritage Landscapes for Northern Routes:

Route N1 is preferred as there are less anticipated impacts on cultural heritage resources.

5.6.3.3 Overall Cultural Environment Evaluation Summary

Preferred South Alternative Route: Both Routes score equal from an overall Cultural Environment perspective

Preferred North Alternative Route: Route N1 is preferred from an overall Cultural Environment perspective.

5.6.4 Legal/Jurisdictional Evaluation

5.6.4.1 Planning Policies and Regulations

Evaluation Criteria: Compliance with applicable planning policies and potential conflict with planning regulations

Alternative Routes S1 and S2:

Both Route S1 and Route S2 comply with applicable planning policies as the new sewer supports planned growth. Route S1 also complies with Peel Region public works policies to locate large diameter infrastructure within major arterial and local collector roads and avoid local roads. Similar amount of construction within TRCA and CVC regulated areas is expected for both Routes S1 and S2.

Summary of Compliance with Applicable Planning Policies for Southern Routes:

Both routes support planned growth, utilize major arterial and/or local collector roads, and have similar amount of construction within conservation authority regulated areas.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

All lands within Route N1 are identified as "2051 New Urban Area" (Schedule E-1 of Peel Official Plan: Regional Structure, April 2022) and this route complies with applicable planning policies in support of planned growth.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

All lands within Route N2 are identified as "2051 New Urban Area" (Schedule E-1 of Peel Official Plan: Regional Structure, April 2022) and this route complies with applicable planning policies in support of planned growth.

More construction within conservation authority regulated areas are expected for Route N2 and significant portion of route is running parallel to Fletchers Creek (between Bovaird Drive and Mayfield Road).

Summary of Compliance with Applicable Planning Policies for Northern Routes:

Route N1 is preferred due to less construction within Conservation Authority regulated areas.

5.6.4.2 Land Requirements

Evaluation Criteria: Land requirements (e.g., number of temporary and permanent easements)

Alternative Route S1 and S2:

At this time, temporary and permanent easements have not been identified for both Routes S1 and S2 as it is assumed that the new STS will be physically installed in existing road right-of-way or utility corridors (e.g., OBR). That said, permanent easements will be required for connections to the existing ECTS and Fletcher's Creek STS.

Temporary and permanent easements for working areas outside of the road right-of-way will be identified in the preliminary design and detailed design stages.

Summary of Land Requirements for Southern Routes:

No preference given as temporary and permanent easements will be confirmed in the preliminary and detailed design stages.

Alternative Routes N1 and N2:

At this time, temporary and permanent easements have not been identified for both Routes N1 and N2 as it is assumed that the new STS will be physically installed in existing road rights-of-way or utility corridors (e.g., OBR).

Temporary easements for working areas outside of the road right-of-way will be identified in the preliminary and detailed design stages.

Summary of Land Requirements for Northern Routes:

No preference given as temporary and permanent easements will be confirmed in the preliminary and detailed design stages.

5.6.4.3 Overall Legal/Jurisdictional Evaluation Summary

Preferred South Alternative Route: Both routes score equal from a legal / jurisdictional perspective.

Preferred North Alternative Route: Route N1 is preferred from an overall legal / jurisdictional perspective.

5.6.5 Technical Evaluation

The south routes, S1 and S2, and the north routes N1 and N2, were evaluated / compared by considering the following technical evaluation criteria as presented in Table 3-2.

5.6.5.1 Constructability

Evaluation Criteria: Consideration of right-of-way width, length of pipe, sewer/shaft depth, construction methodology, significant major infrastructure crossings, and shaft locations

Alternative Route S1: Kennedy Road/Bovaird Drive to McLaughlin Road

The S1 route length is approximately 9 kilometres along Kennedy Road from the south connection point at Etobicoke Creek to/and along Bovaird Drive to the OBR with a right-of-way width of 50 metres that can accommodate the STS construction.

Due to the depth of the STS in the range of between 10 to 30 metres, a trenchless construction methodology will be required for the alignment. An estimated 12 shafts will be located to minimize conflicts with near surface utilities as much as possible.

Connections to existing STS and sub-trunks will use open-cut construction methods. Shaft location and connection to existing and proposed twinning of Etobicoke Creek

STS will be installed inside the travelled section of the Kennedy Road as per the current detailed design drawings.

The majority of shafts on Bovaird Drive can be installed outside the travelled section of the roadway and still within the existing right-of-way, with the exception of the shaft at Bovaird Drive and Kennedy Road.

Along the 4 kilometre S1 route that differs from the S2 route, that is, along Kennedy Road north of Vodden Street, and along Bovaird Drive, the ground elevation climbs to a depth of 30 metres. This is significantly deeper than the S2 route. This depth will negatively impact construction footprint, construction duration, cost, operation and maintenance as compared to the S2 route.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

The S2 route length is approximately 9 kilometre along Kennedy Road from the south connection point at Etobicoke Creek to/and along Vodden Street, then along the Orangeville Bampton Railway corridor up to Bovaird with a right-of-way width ranging from 20 metres to 30 metres (average of 20 metres) on Vodden Street and 20 metres along the OBR corridor.

Due to the depth of the STS in the range of between 10 to 30 metres, a trenchless construction methodology will be required for the alignment. An estimated 12 shafts will be located to minimize conflicts with near surface utilities as much as possible.

Connections to existing STS and sub-trunks will use open-cut construction method. Shaft and connection to existing and proposed twinning of Etobicoke Creek STS will be installed inside travelled section of roadway as per current detailed design drawings. Shaft and connection to existing ECTS will be installed outside travelled section of roadway on Vodden Street utilizing existing right-of-way.

Along the 4 kilometre S2 alignment that differs from the S1 alignment, that is, along Vodden Street and along the OBR corridor north to Bovaird Drive, the ground elevation decreases to a depth of 10 metres at the proposed shaft location. This is significantly shallower than the S1 route. At this depth, there is significantly less impact on construction footprint, construction duration, cost, operation and maintenance as compared to the S1 route.

Summary of Constructability for Southern Routes:

Route S1 is less preferred due to significantly deeper shafts compared to Route S2. As a result, Route S1 has increased construction duration and costs. In addition, there will be an increase in time spent by staff accessing the sewer for operations and maintenance will be increased. Route S2 is preferred due to significantly shallower shafts compared to Route S1.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

The N1 route length is approximately 8.6 kilometres along the Orangeville-Brampton Rail corridor from Bovaird Drive to Old School Road and then along Old School Road to Hurontario Street with a right-of-way width of 20 metres.

Due to the depth of the STS in the range of between 10 to 30 metres, a trenchless construction methodology will be used for the alignment. An estimated 9 shafts will be located to minimize conflicts with near surface utilities as much as possible.

Connections to the existing STS and sub-trunks will use open-cut construction methods. Shafts and connections to existing and proposed sewers will be installed inside the OBR right-of-way and travelled section of Old School Road.

There would be additional open cut sewer required to tie in future 525 millimetre STS at McLaughlin Road. In addition, access road from McLaughlin Road through future development lands will be required in the northerly section of the route.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

The N2 route length is approximately 9.6 kilometres from Bovaird Drive/OBR intersection west along Bovaird Drive, then north on McLaughlin Road North and East on Old School Road to the north connection point at Old School Road and Hurontario Street. For McLaughlin Road (south of Mayfield), the right-of-way width is 40 metres. McLaughlin Road (north of Mayfield) and on Old School Road, the right-of-way width is 20 metres.

Due to the depth of the STS in the range of between 10 to 30 metres, a trenchless construction methodology will be required for the alignment. An estimated 12 shafts will be located mostly in the right-of-way, however, to minimize conflicts with near surface utilities as much as possible.

Connections to existing sewers and future sewers related to development will use open-cut construction methods. Construction methods of the proposed connections to the STS and sub-trunks will be co-ordinated with land development. Significant land development on both sides of the right-of-way may create some construction issues.

Summary of Constructability for Northern Routes:

Along Route N1, the OBR alignment avoids work in heavily travelled road allowances as well as utilities and watercourse encroachments.

Furthermore, Route N2, McLaughlin Road is heavily travelled south of Mayfield Road with significant utility conflicts and watercourse encroachments into the right-of-way, thus limiting space for construction and greater impacts to the travelling public.

5.6.5.2 Permits and Approvals

Evaluation Criteria: Complexity and duration to obtain the necessary permits and approvals and Road ownership/occupancy permits

Alternative Route S1: Kennedy Road/Bovaird Drive to OBR

Similar permits are required for both alternatives (requires Canadian National Railway work permit, and TRCA approvals).

Kennedy Road south of Steeles Avenue is within City of Brampton's jurisdiction (common to both routes) which requires Road Occupancy Permits. The remainder of Kennedy Road and Bovaird Drive are Regional roads which will also require Road Occupancy Permits.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

Similar permits are required for both alternatives (Canadian National Railway, and TRCA approvals). Kennedy Road south of Steeles Avenue is within City of Brampton's jurisdiction (common to both routes) which requires Road Occupancy Permits.

In addition, Kennedy Road north of Steeles Avenue is a Regional road which will also require Road Occupancy Permits. Vodden Street from Kennedy Road to OBR is City of Brampton jurisdiction.

Summary of Permits and Approvals for Southern Routes:

Route S1 maximizes the use of regional roads, however it would still require Road Occupancy Permits from the Region, which would be similar to obtaining Road Occupancy Permits from the City. Route S2 requires more construction within City of Brampton roads, but it would be similar level of efforts to obtain road occupancy permits as Route S1.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

Route N1 has less complicated permitting requirements and shorter duration of works in regulated areas of TRCA and CVC.

This route does not require Canadian National Railway work permit, however, requires Ministry of Transportation Encroachment Permit at Old School Road and Hurontario Street. In addition, Route N1 requires Road Occupancy Permit from the Town of Caledon.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

Route N2 is more complicated with respect to permitting and approvals: it requires a longer duration of TRCA and CVC permitting due to a significant portion of route being located within CVC regulated areas related to Fletchers Creek running parallel to McLaughlin Road between Bovaird Drive and Mayfield Road.

This route does not require Canadian National Railway work permit, however, requires Ministry of Transportation Encroachment Permit at Old School Road and Hurontario Street. In addition, Route N2 requires Road Occupancy Permits from the City of Brampton and Town of Caledon.

Summary of Permits and Approvals for Northern Routes:

Route N1 is more preferred from a permits and approvals perspective as both permitting/approvals and road occupancy requirements are less. Route N2 is less preferred from a permits and approvals perspective as both permitting/approvals and road occupancy requirements are more.

5.6.5.3 Connections to Existing and Future STS and Sub-trunks

Evaluation Criteria: Ability to optimize connections to free up capacity in the existing system

Alternative Route S1: Kennedy Road/Bovaird Drive to OBR

Route S1 connections include: connecting to a 300 millimetre north of Williams Parkway, at Sheffield Park East; and connecting to the 975 millimetre sanitary at Etobicoke Creek on Bovaird Drive, west of Kennedy Road. Connections cross the S1 route, therefore the pipeline length is minimized. Route S1 provides a connection point further upstream than route S2, thereby freeing up capacity of the existing sanitary sub-trunks for a greater pipeline alignment length.

However, connections on Bovaird Drive are expected to pick up less volume of flow upstream thereby freeing up less capacity in the existing wastewater system for future Major Transit Station Areas.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

Connections to the existing STS and sub-trunks will use open-cut construction methods.

For the S2 route, 3 sub-trunk connection points on Bovaird Drive and Kennedy (675 millimetre connection at Bovaird /OBR, 975 millimetre connection at Etobicoke Creek/Bovaird Drive, and the 300 millimetre at Sheffield Park East) flow towards and merge before crossing Vodden Street at Etobicoke Creek. Therefore, only one shaft (10 metres deep) is needed for the connection and no extra connection pipe alignment

is needed. The pipeline length is minimized. The Route S2 connection of the 1200 millimetre sanitary sub-trunk at Etobicoke Creek is further downstream, therefore, it doesn't free up as much of the sub-trunk length upstream as Route S1.

However, the connection point on Vodden Street is expected to intercept a greater volume of flow than Route S1, thereby freeing up more capacity for future Major Transit Station Areas.

Summary of Connections to Existing and Future STS and Sub-trunks for Southern Routes:

The Bovaird Drive alignment is less effective at freeing up capacity at Major Transit Station Areas while Vodden Street alignment is more effective at freeing up capacity at Major Transit Station Areas.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

A longer length of connection pipe alignment along Bovaird Drive would be required to make connection from Fletcher's Creek sanitary sewer (950 metres west of the OBR shaft) to the N1 route.

Both routes accommodate connections from future developments such as the Hurontario Employment Secondary Plan and Mayfield West -Street 'A' development, as per comments after the PIC #1.

Alternative Route N2: McLaughlin Road from Bovaird Drive to Old School Road/ Old School Road to Hurontario Street

A shorter length of connection pipe alignment along Bovaird Drive would be required to make a connection from Fletcher's Creek sanitary sewer (250 metres west of McLaughlin) to the N2 route.

Both routes accommodate connections from future developments such as the Hurontario Employment Secondary Plan and Mayfield West -Street 'A' development, as per comments received after the PIC.

Summary of Connections to Existing and Future STS and Sub-trunks for Northern Routes:

Route N1 is less preferred due to longer length of connection from Fletcher's Creek STS. Route N2 is more preferred due to shorter length of connection from Fletcher's Creek STS.

5.6.5.4 Operations and Maintenance

Evaluation Criteria: Accessibility to maintenance chambers sites and sewer pipes

Alternative Route S1: Kennedy Road/Bovaird Drive to OBR

Bovaird Drive is a heavily travelled roadway but boulevards are wide potentially allowing access to shafts with minimal traffic management planning and setup for operation and maintenance purposes. In addition, along Route S1, shafts and chambers are deeper and thus more difficult to maintain.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

The Vodden Street portion right-of-way is not as heavily travelled or as wide as Bovaird Drive therefore access to shafts may require Traffic Management Plans and additional setup. Lane closure may be required to access chambers for maintenance. In addition, along Route S1, shafts and chambers are less deep and thus facilitating easier maintenance.

Summary of Operations and Maintenance for Southern Routes:

Both Routes S1 and S2 score equally from operations and maintenance perspective.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

Accessibility to maintenance chambers sites will be from cross streets as part of future development that connects to McLaughlin Road. For the north portion of the OBR corridor route, there will be access via future road crossing as part of the development of this area.

Access for operations and maintenance will be from less travelled cross streets as part of future developments on the east side of McLaughlin Road. However, getting to the cross streets may take longer.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

Access for operations and maintenance will be within right-of-way of McLaughlin Road with wide boulevards, allowing access to shafts with minimal traffic management planning and setup. McLaughlin Road is also easier to access.

Summary of Operation and Maintenance for Northern Routes:

Route N1 is less preferred due to accessibility for operations and maintenance purposes N1 less.

5.6.5.5 Conflicts with Existing Utilities

Evaluation Criteria: Significance of existing utilities and infrastructure and ability to maintain existing services or relocate existing utilities

Alternative Route S1: Kennedy Road/Bovaird Drive to OBR

Route S1 has more space to implement relocation of near-surface utilities at shaft locations, if required, as compared to Vodden Street.

There is significant storm sewer infrastructure at the Queen Street shaft location for both Routes S1 and S2. Both Routes S1 and S2 have significant power lines (3-phase power -2 circuits). However, Route S1 has power lines (3-phase power -2 circuits) on the east side of Kennedy Road towards Bovaird Drive, and on the north side of Bovaird Drive.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

Route S2 has less space to implement potential relocation of near- surface utilities at shaft locations. There is significant storm sewer infrastructure at the Queen Street shaft location for both Routes S1 and S2. Both Routes S1 and S2 have significant power lines (3-phase power -2 circuits). Route S2 has power lines (3-phase power -2 circuits) on the north side of Vodden Street.

Summary of Conflicts with Existing Utilities for Southern Routes:

Route S1 is preferred as it has more space for potential relocation of utilities at shaft locations. Route S2 is less preferred due to less space to implement potential relocations of near-surface utilities at shaft locations 2.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

There are only a limited number of existing utilities crossings or runs along the OBR right-of-way. There is a natural gas pipeline that crosses both McLaughlin Road and the OBR corridor.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

Shafts will be located to minimize conflicts with near surface utilities as much as possible. Some local relocation of near-surface utilities at shaft locations is expected.

Significant existing infrastructure along the right-of-way includes a Hydro power line (2 circuits of 3-phase power) on the east side of McLaughlin Road.

There is a natural gas pipeline that crosses both McLaughlin Road and the OBR corridor. There is a gas pipeline meter station on McLaughlin Road.

Summary of Conflicts with Existing Utilities for Northern Routes:

Route N1 is preferred as there are minimal utilities within the trunk sewer's routing alignment. Route N2 is less preferred as there are significant utilities within the trunk sewer's routing alignment.

5.6.5.6 Conflicts with Existing or Planned Infrastructure Improvements

Evaluation Criteria: Ability to avoid or mitigate conflicts with existing infrastructure and opportunity to co-ordinate project with other planned infrastructure improvements

Alternative Route S1: Kennedy Road/Bovaird Drive to OBR

Route S1 has more space in the right-of-way to implement infrastructure improvements, if required, as compared to Vodden Street. There is also conflict with recent Bovaird Drive (Hurontario Street to Kennedy Road) road/active transportation improvements.

Lastly, there is a potential overlap between Williams Parkway transmission main and road improvements in addition to Queen Street infrastructure projects.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

Vodden Street has temporary bike lanes that would be closed during construction at shaft locations and more difficult to mitigate.

In addition, the City of Brampton's East-West Cycling Corridor project includes Vodden Street from Kennedy Road to Main Street. Current bicycle lanes are considered as permanent installations.

There is also potential overlap between the Williams Parkway transmission main and road improvement projects in addition to the Queen Street infrastructure projects.

Route S2 provides opportunity to continue using future Williams Parkway 1,200 millimetre watermain's shaft compound at Armbro Park, which is currently being negotiated with by the City of Brampton. Lastly, there is an opportunity to co-ordinate OBR multi-use trail improvements between Vodden Street and Bovaird Drive.

Summary of Conflicts with Existing or Planned Infrastructure Improvements for Southern Routes:

Route S1 has significant conflict with recent Bovaird Drive/active transportation improvements. Whereas Route S2 has minor conflicts with recent active transportation improvements. Route S2 is also preferred as it provides an opportunity to co-ordinate restoration with OBR Multi-Use Trail.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

Only a limited number of existing utilities cross or run along the OBR right-of-way, thus allowing for improvements, if required.

Moratorium will be applied to Mayfield Road following completion of road reconstruction that is currently underway.

Route N1 provides opportunity to co-ordinate STS restoration with planned OBR Multi Use Trail. There is also potential to co-ordinate with future planned Old School Road's road improvements along Route N1.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

There is sufficient space in right-of-way along Route N2 to implement infrastructure improvements, if required. However, it should be noted that there will be a moratorium (avoid disturbing recent construction) applied to Mayfield Road following completion of road reconstruction that is currently underway.

Route N2 does not provide opportunity to co-ordinate STS restoration with planned OBR Multi Use Trail. However, similar to Route N1, there is potential to co-ordinate with future planned Old School Road's road improvements along Route N2.

Summary of Conflicts with Existing or Planned Infrastructure Improvements for Northern Routes:

Route N1 is more preferred due to limited conflicts with existing and planned infrastructure including co-ordination with future OBR Multi-Use Trail. Route N2 is less preferred due to more conflicts with existing and planned infrastructure, and it does not provide opportunity to co-ordinate with future OBR Multi-Use Trail.

5.6.5.7 Construction Truck Traffic Management Issues during Construction

Evaluation Criteria: Ease of access to haul routes and ease of truck traffic management

Alternative Route S1: Kennedy Road/Bovaird Drive to OBR

Bovaird Drive is a major arterial road and accommodates significant truck traffic and therefore the added truck traffic from construction would not be as impactful.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

Vodden Street is a local collector road with less truck traffic and therefore added truck traffic from construction will be more impactful.

Summary of Truck Traffic Management Issues during Construction for Southern Routes:

Route S1 has less impacts related to construction truck traffic, while Route S2 has more impacts related to construction truck traffic.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

Bovaird Drive, Sandalwood Parkway, Wanless Drive and Mayfield Road are major arterial roads and can accommodate significant truck traffic, and therefore, the added truck traffic from construction would not be as impactful.

North of Mayfield Road, access will be through future development roads off of east side of McLaughlin Road.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

McLaughlin Road is a major arterial road and can accommodate significant truck traffic and therefore the added truck traffic from construction would not be as impactful.

Summary of Truck Traffic Management Issues during Construction for Northern Routes:

Route N1 has slightly more impacts related to construction truck traffic. Route N2 has less impacts related to construction truck traffic.

5.6.5.8 Overall Technical Evaluation Summary

Preferred South Alternative Route: Route S2 is preferred from overall technical environment perspective.

Preferred North Alternative Route: Roue N1 is preferred from overall technical environment perspective.

5.6.6 Climate Change Evaluation

5.6.6.1 Climate Change Mitigation

Evaluation Criteria: Potential for generating greenhouse gas emissions

Alternative Routes S1 and S2:

Both Routes S1 and S2 are similar in length and as such generate similar amount of greenhouse gas emissions during construction.

Alternative Routes N1 and N2:

Route N1 is slightly shorter in length compared to Route N2 and as such has slightly less emissions related to shorter construction duration.

Summary of Climate Change Mitigation for Southern Routes:

No preference as both southern routes are similar in length and generate similar emissions related to construction duration.

Summary of Climate Change Mitigation for Northern Routes:

Route N1 is slightly shorter in length compared to Route N2 and as such has slightly less emissions related to shorter construction duration.

5.6.6.2 Climate Change Adaptation

Evaluation Criteria: Vulnerability of project/ infrastructure to climate change effects

Alternative Route S1: Kennedy Road/Bovaird Drive to OBR

Route S1 has similar amount of construction within TRCA regulated areas and probability of flooding.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

Route S2 has similar amount of construction within TRCA regulated areas and probability of flooding.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

Route N1 has one shaft compound in TRCA regulated area (potential flooding risk).

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

Route N2 has five shaft compounds in CVC/TRCA regulated areas and higher potential risk of flooding.

5.6.6.3 Overall Climate Change Evaluation Summary

Preferred South Alternative Route: Both routes score similar from overall climate change perspective

Preferred North Alternative Route: Route N1 is preferred from overall climate change perspective.

5.6.7 Economic/Financial Evaluation

5.6.7.1 Construction Costs

Evaluation Criteria: Estimated construction costs

Alternative Route S1: Kennedy Road/Bovaird Drive to McLaughlin Road

There is a higher cost related to many deep shafts along Route S1 thus extending compound duration affecting high traffic road allowance.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

Route S2 has lower costs related to shallower shafts on Vodden Street which has lower traffic volumes. Route S2 also has shorter construction duration and thus less construction cost.

Route S2 also minimizes impacts to traffic by using Vodden Street and maximizing OBR right-of way. OBR has an existing sanitary sewer, however, construction impacts will be minimal due to depth of new STS. Lastly, it should be noted that the OBR has potential soil contamination related to former rail operations requiring more mitigation and cost.

Summary of Construction Costs for Southern Routes:

Route S1 is less preferred from a construction cost perspective due to deep tunnel shafts including extended construction duration within high traffic right-of-way.

Route S2 is more preferred from a construction cost perspective due to shallower tunnel shafts and shorter construction duration within lower traffic right-of-way.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

Route N1 minimizes impacts to traffic by maximizing OBR right of way (lower traffic management costs) and has lower site restoration costs.

OBR also has minimal utilities and therefore lower construction costs. Lastly, OBR has potential soil contamination related to former rail operations, potentially requiring remediation at shaft compounds.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

Comparatively, Route N2 has higher costs related to many shaft compounds in high traffic road allowance requiring more complicated traffic management and plan and higher site restoration costs. There is potential for utility conflicts along Route N2 resulting in utility relocations or protections.

Summary of Construction Costs for Northern Routes:

Route N1 is preferred due to lower construction costs.

5.6.7.2 Operations and Maintenance Costs

Evaluation Criteria: Estimated operations and maintenance costs

Alternative Route S1: Kennedy Road/Bovaird Drive to McLaughlin Road

Route S1 has higher cost related to accessing shafts in high traffic right of way corridors (Kennedy Road and Bovaird Road). Deeper shafts and chambers along Route S1 would require longer maintenance time, specialized equipment and thus cost more.

Alternative Route S2: Kennedy Road/Vodden Street/OBR (to Bovaird Drive)

Route S2 provides for easier access to shafts related to shallower depth and less traffic volumes in the right of way (Vodden Street and OBR alignment). Shallower shafts and chambers along Route S2 would require shorter maintenance time and thus cost less.

Summary of Operations and Maintenance Costs for Southern Routes:

Route S2 is more preferred from operations and maintenance cost perspective.

Alternative Route N1: OBR from Bovaird Drive/Old School Road to Hurontario Street

North portion of OBR route will require access from future local roads, resulting in lower costs as traffic management needs will be less complicated. Route N1 has similar operations and maintenance costs as Route N2.

Alternative Route N2: McLaughlin Road to Bovaird Drive/ Old School Road to Hurontario Street

Access for operations and maintenance will be within right-of-way of McLaughlin Road, resulting in higher costs for traffic management. Route N2 has similar operations and maintenance costs.

Summary of Operations and Maintenance Costs for Northern Routes:

Route N1 is preferred due to lower operation and maintenance costs.

5.6.7.3 Overall Economic/Financial Evaluation Summary

Preferred South Alternative Route: Route S2 is preferred from overall economic/financial perspective.

Preferred North Alternative Route: Route N1 is preferred from an overall economic/financial perspective.

5.7 Overall Evaluation Summary and Recommended Preferred Route

As described above and in the short-list route evaluation matrices (Appendix K) there is a clear preference for **Route S2: Kennedy/Vodden/OBR** and **Route N1: OBR/Old School Road.**

The following Figure 5-9 and Figure 5-10 provide a high-level overview of how each south and north short-list route was evaluated.

The selected north and south routes have been combined and shown in Figure 5-11.

Ultimately, the Overall Recommended Preferred Route is shown on Figure 5-12.

Figure 5-13 presents the profile drawing for the Overall Recommended Preferred Route.

Figure 5-9: Summary of South Short-list Route Evaluation

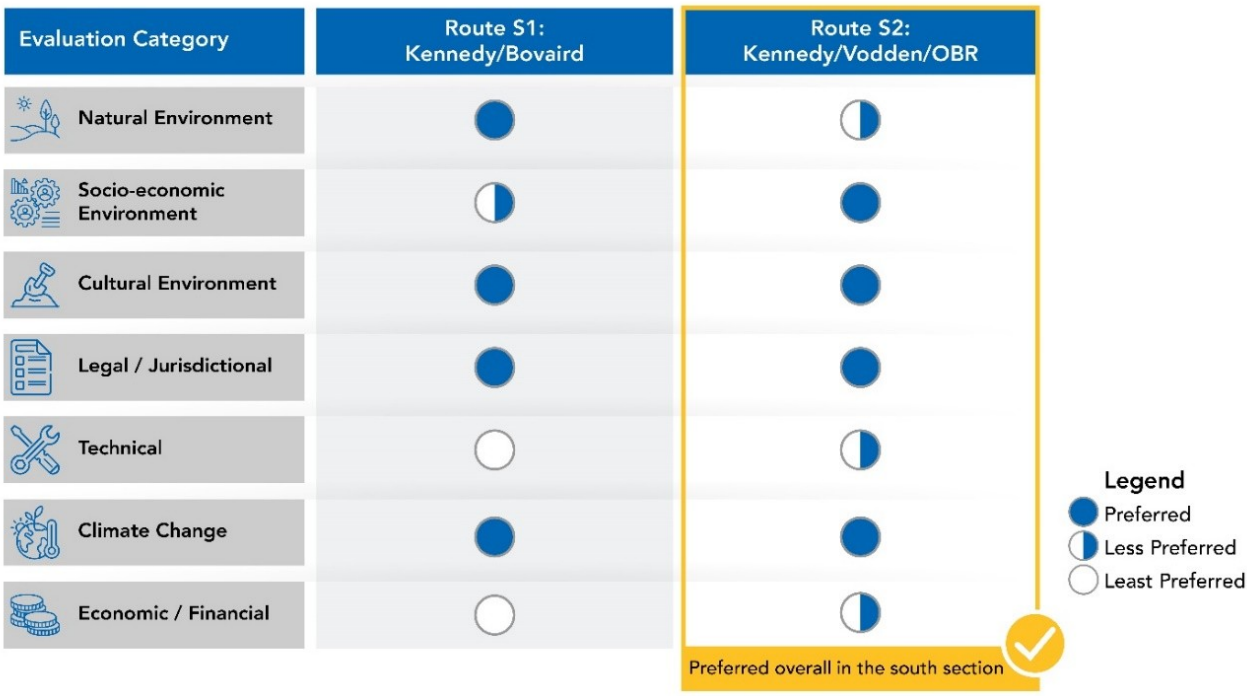


Figure 5-10: Summary of North Short-list Route Evaluation

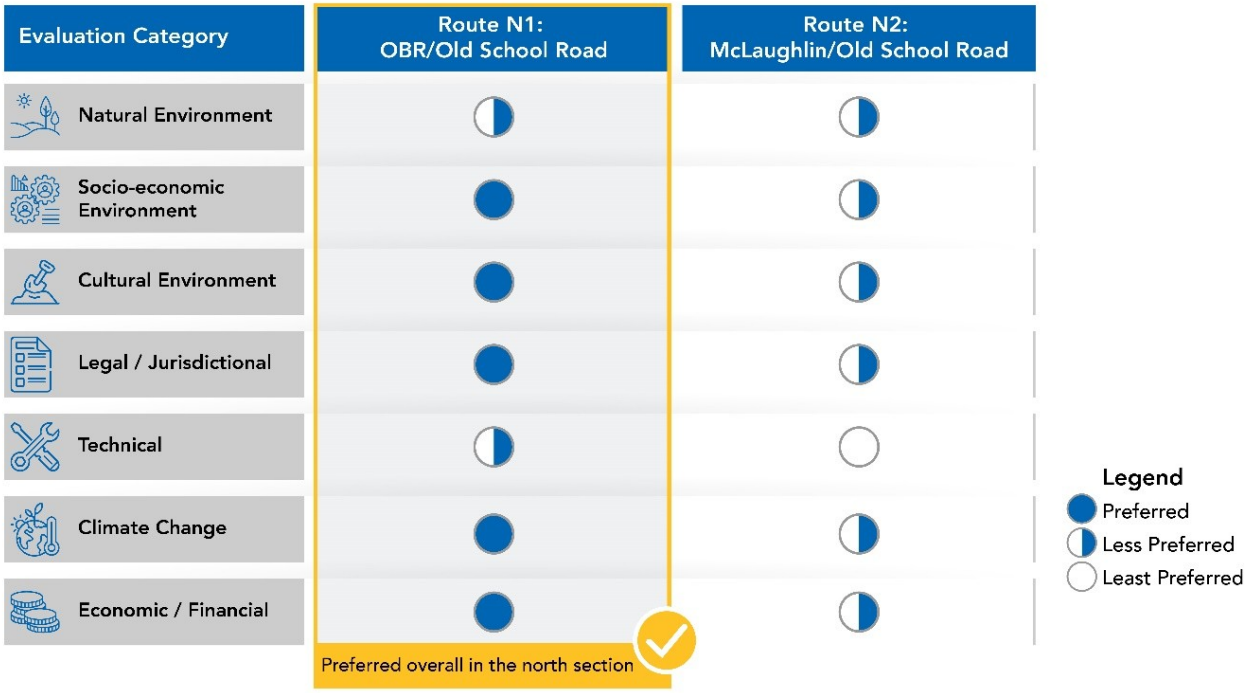
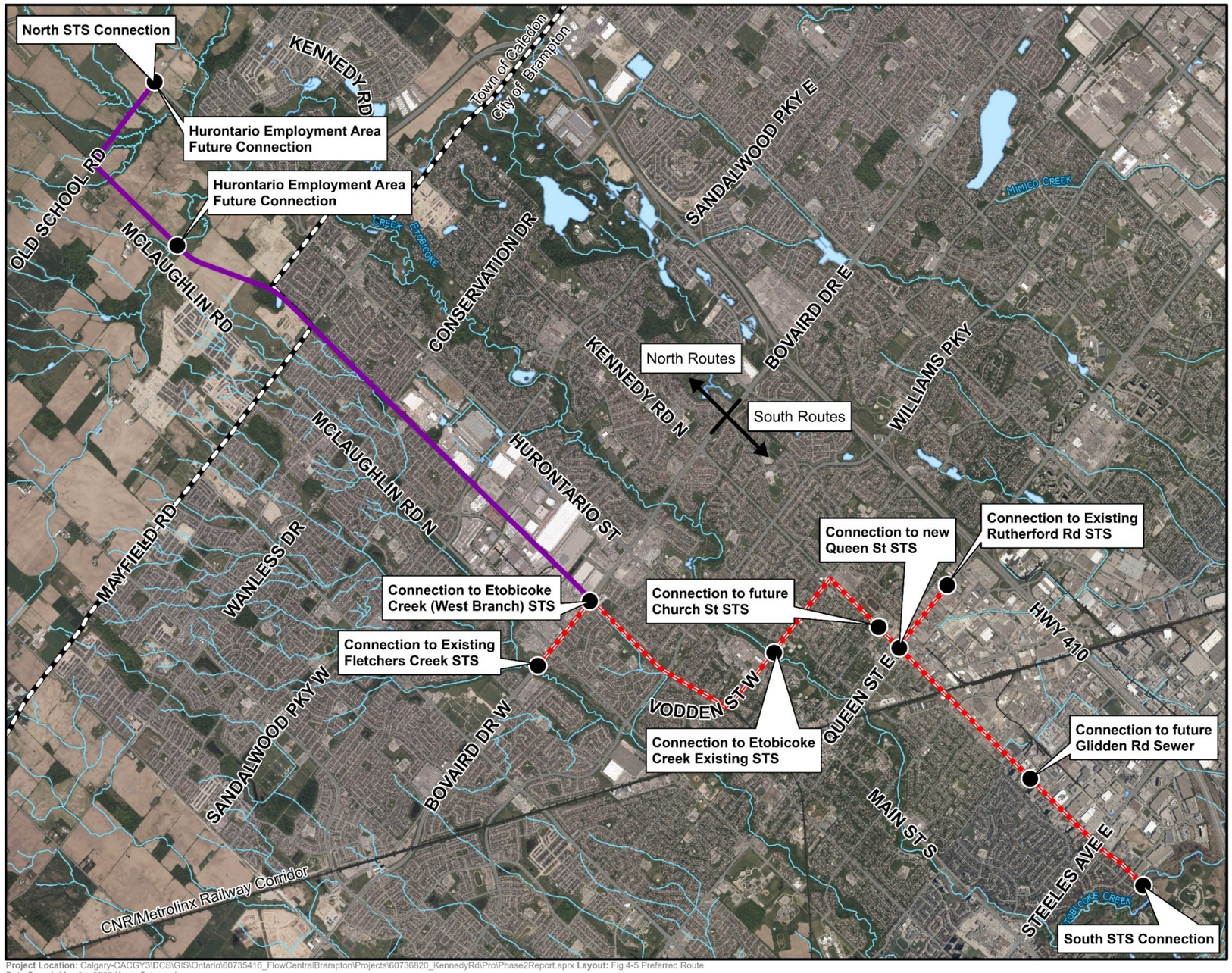
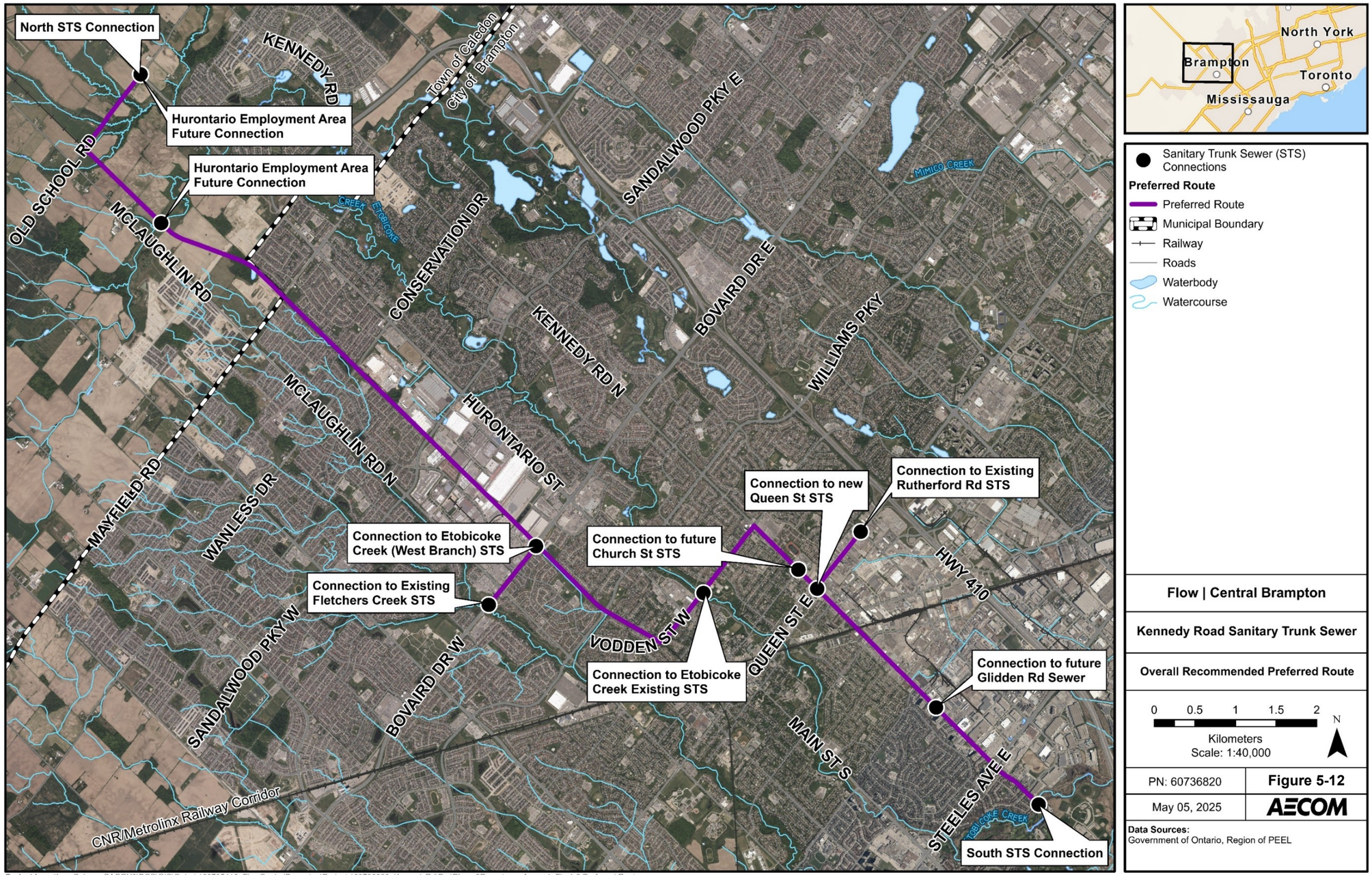


Figure 5-11: Combined North and South Recommended Preferred Routes



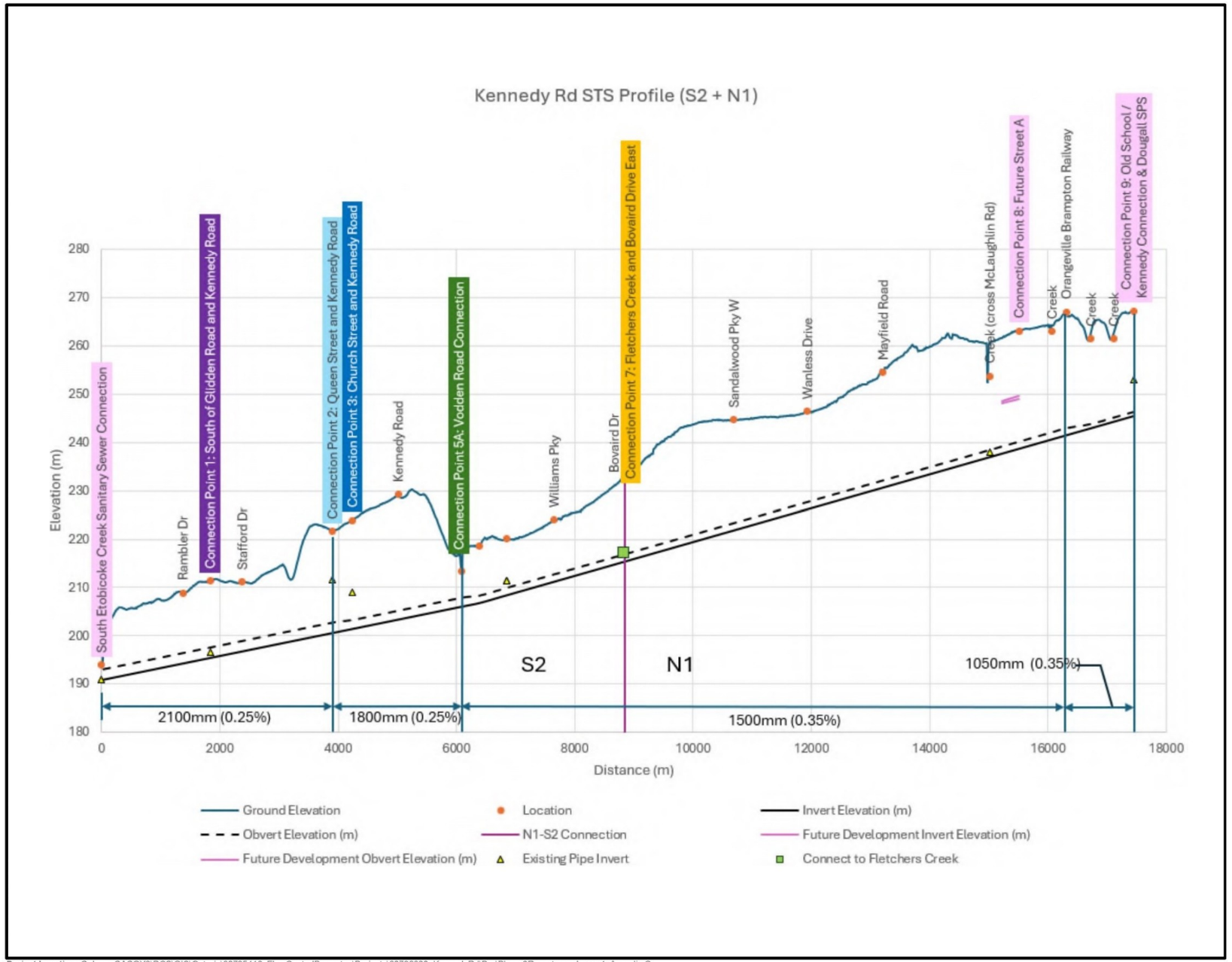
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Figure 5-12: Overall Recommended Preferred Route

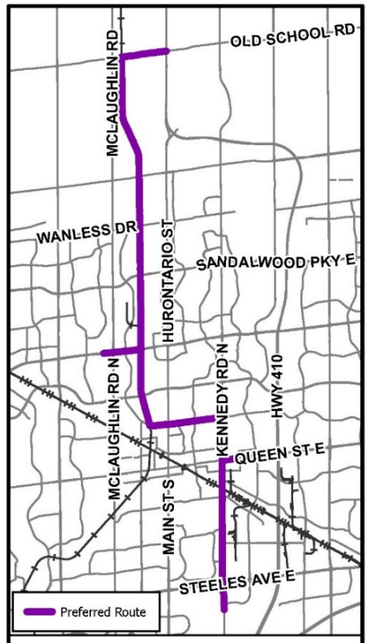


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Figure 5-13: Recommended Preferred Route Profile







Flow | Central Brampton

Kennedy Road Sanitary Trunk Sewer

Overall Recommended Preferred Route Profile

0 0.5 1 1.5 2
Kilometers
Scale: 1:40,000

PN: 60736820	**Figure 5-12**
May 05, 2025	AECOM

Data Sources:
Government of Ontario, Region of PEEL

Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Projects\60736820_KennedyRd\Pro\Phase2Report.aprx **Layout:** Apendix C
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5.8 Queen Street Extension East – Kennedy Road to Rutherford Road

5.8.1 Queen Street Route Impact Screening

The project also includes the construction of a new sanitary subtrunk sewer on Queen Street from the proposed Kennedy Road STS to intercept flows from the Rutherford North sewer and sanitary sewers on Queen Street at Hansen Road (see Figure 5-11: Selected Combined North and South Routes). The purpose of this project component is to capture flows from the Rutherford North catchment area and divert them to the new Kennedy Road STS to free up capacity in the existing sewers east of Kennedy Road, tributary to the Rutherford Road S sanitary sewer that also outlets into the ECTS. Given that the Kennedy Road (at Queen Street) and Rutherford Road (at Queen Street) connection points are fixed and there are no reasonable east-west alternative trunk sewer alignments, no alternative routing option was identified.

It is noted that the Region has identified sewer capacity constraints in the Rutherford Road S/Glidden Road area and has requested that a provisional connection point be made for a future sewer on Glidden Road and Kennedy Road to the Kennedy Road STS.

The following Table 5-4 summarizes potential impacts along the affected Queen Street section of the proposed sewer alignment.

Table 5-4: Evaluation of Alternatives – Queen Street: Kennedy Road and Rutherford North Extension

Category	Criteria	Indicator/Consideration	Queen Street: Kennedy Road/Rutherford North
Natural Environment	■ Potential effects on water resources	■ Disruption to fish including spawning periods and physical changes to aquatic habitat (e.g., number and type of watercourse crossings) ■ Anticipated amount of groundwater management (e.g., potential short-term water taking)	■ None ■ Low groundwater management complexity (no work within TRCA regulated area)
Natural Environment	■ Potential effects on terrestrial features	■ Loss of or disruption to sensitive species habitat and natural heritage features (e.g., significant wetlands and woodlands, significant wildlife habitats, proximity to provincially or locally/regionally rare amphibians, birds or wildlife)	■ There are no natural heritage features located within 120 metres of the Queen Street Route from Kennedy Road to Rutherford Road North that may be indirectly or directly affected via the trenchless method.
Natural Environment	■ Potential effects on Species at Risk and Species at Risk habitat	■ Loss of or disruption/disturbance to Species at Risk or their habitats affecting the species ability to carry out its critical life processes in the local area	■ There are no Species at Risk that may occur within 120 metres of the Queen Street Route from Kennedy Road to Rutherford Road North ■ The route is located along urban developed areas.
Natural Environment	■ Potential effects on soil and groundwater	■ Potential to encounter soil and groundwater contamination and ability to mitigate	■ Soil and groundwater contamination mitigation strategies to be confirmed during design phase
Natural Environment	Evaluation Ranking	-	No ranking as there is no alternative routing option
Socio-Economic Environment	■ Number of potentially impacted sensitive receptors5 during construction and potential for increased noise, dust and vibration and reduced property access and potential business losses related to customers avoiding trips to high traffic commercial areas	■ Schools ■ Daycares ■ Hospitals and emergency services ■ Nursing homes ■ Long-term care facilities ■ Places of worship ■ Recreational facilities and community centres ■ Parks ■ High traffic commercial areas ■ Libraries ■ Cemeteries	Notable Sensitive Receptors: ■ Wise Elephant Family Health Team (2 Kennedy Road South, Unit 4, Brampton, ON L6W 3E1) ■ triOS College Business Technology Healthcare, Brampton Campus (252 Queen Street East, Brampton, ON L6V 1C1) ■ BrightPath Queen Campus Child Care Centre (255 Queen Street East, Brampton, ON L6W 2B8) ■ Queen's Urgent Care and Medical Centre Brampton (263 Queen Street East #20, Brampton, ON L6W 4K6) ■ Queens Gate Academy (255 Queen Street East #3, Brampton, ON L6W 2B8)
Socio-Economic Environment	■ Traffic and active transportation impacts during construction, including expected lane, sidewalk, trails, and bike lane closures	■ Expected number/direction/duration of open lanes during construction and reduction in the number of intersecting roads affected by shaft locations ■ Potential for increased public scrutiny related to inconvenience of higher traffic volumes/closures ■ Opportunities to enhance active transportation	■ Route impacts vehicle traffic along Queen Street, a 6-lane Major Arterial City roadway (Regional Roadway outside of this section). ■ High traffic volumes on Queen Street ■ Route impacts three crossing roads where this route intersects other City roadways: – Kennedy Road is a 4-lane Major Arterial Road (City and Regional) and Brampton Transit corridor – Rutherford Road North is a 2-lane and 4-lane Collector Road (City); 2-lane north of Queen Street/4-lane south of Queen Street – Hansen Drive is a 2-lane Local Road (City) ■ Potentially increases delay to 3 crossing roads where Queen Street intersects Rutherford Road, Hansen Road, and Kennedy Road ■ Anticipate 2 lane closure on Queen Street ■ Limited opportunities to enhance active transportation

5. Sensitive receptors refer to people, places, or things that could be affected by impacts from construction.

Category	Criteria	Indicator/Consideration	Queen Street: Kennedy Road/Rutherford North
Socio-Economic Environment	■ Potential impacts on public transit during construction (e.g., bus stop closure/relocation)	■ Relocation of bus shelters and transit stops ■ Temporary service interruptions ■ Consideration of higher order transit routes	■ Impacts Queen Street Züm Rapid Transit corridor; Queen Street is an identified future Higher Order Transit (Bus Rapid Transportation/ Light Rail Transportation) Corridor and Major Transit Station corridor. ■ Impacts Kennedy Road Brampton Transit corridor ■ Potential relocation of bus shelters and transit stops along Queen Street
Socio-Economic Environment	Evaluation Ranking	-	No ranking as there is no alternative routing option
Cultural Environment	■ Potential for loss and/or disturbance to potential archaeological resources	■ Loss of or destruction of significant cultural heritage resources and archaeological sites and ability to mitigate	■ Low archaeological potential along existing paved roads due to previous disturbance. Moderate to high archaeological potential for most areas outside of the paved roadway. Stage 2 archaeological investigations required for all undisturbed lands, including tunnel shaft location areas.
Cultural Environment	■ Potential effects on built heritage resources and cultural heritage landscapes	■ Loss of or disruption to built heritage resources and cultural heritage landscapes (e.g., loss of a historic farmhouse or significant disruption of agricultural lands of a historic farmstead)	■ No known cultural heritage resources are located within or adjacent to this route. Therefore, no direct or indirect adverse impacts are anticipated.
Cultural Environment	Evaluation Ranking	-	No ranking as there is no alternative routing option
Legal/Jurisdictional	■ Compliance with applicable planning policies	■ Potential conflicts with Peel Region, Town of Caledon, and City of Brampton Official Plan policies, including Secondary Plans, Master Servicing Plans and TRCA and CVC regulations	■ Compliant – no issues (supports planned growth) ■ Complies with regional public works policies to locate large diameter infrastructure within major arterial roads
Legal/Jurisdictional	■ Land requirements	■ Number of temporary and/or permanent easements	■ No permanent easement identified ■ Potential temporary easements to be confirmed in Phase 3 design concept stage
Legal/Jurisdictional	Evaluation Ranking	-	No ranking as there is no alternative routing option
Technical Environment	■ Constructability	■ Right-of-way width, ■ Length of pipe, ■ Sewer/shaft depth, ■ Construction methodology, ■ Significant major infrastructure crossings ■ Shaft locations (e.g., in travelled section of right-of-way vs. outside of travelled section of right-of-way)	■ Queen Street (east of Kennedy) right-of-way= 30 metres ■ The route length is approximately 500 metres from Kennedy Road to Rutherford Road. ■ Depth of the proposed sanitary sub-trunk sewer is approximately 10 metres. ■ Pipe/MH installation will use both open-cut and trenchless construction methods.
Technical Environment	■ Permits and approvals	■ Complexity and duration to obtain the necessary permits and approvals (e.g., MTO/CNR/ Metrolinx and TRCA/CVC permits for work in regulated areas) ■ Road ownership/occupancy permits	■ Fairly straight-forward with requirements to obtain required approvals well known.
Technical Environment	■ Connection points to existing and future Sanitary Trunk Sewers and local sanitary sewers	■ Ability to optimize connections to free up capacity in the existing system	■ Shaft located at Kennedy Road for STS construction could potentially be used for the construction of the sub-trunk on Queen Street. ■ Open cut will be required to connect local sewers to the sub-trunk.
Technical Environment	■ Operations and maintenance	■ Accessibility to maintenance chambers sites and sewer pipes	■ Queen Street right-of-way is heavily travelled and the boulevards are well used thus resulting in expected impacts to traffic related to location of shafts and connecting sewers. Traffic management planning issues that will need to be addressed.

Category	Criteria	Indicator/Consideration	Queen Street: Kennedy Road/Rutherford North
Technical Environment	■ Conflicts with existing utilities	■ Significance of existing utilities and infrastructure and ability to maintain existing services or relocate existing utilities	■ Local relocation of near-surface utilities at shaft locations. Significant storm sewer infrastructure at proposed Queen Street shaft locations. ■ Hydro - 3 circuits of 3-phase power on the north side road.
Technical Environment	■ Conflicts with existing or planned infrastructure improvements	■ Ability to avoid or mitigate conflicts with existing infrastructure ■ Opportunity to co-ordinate STS with other planned infrastructure improvements (e.g., OBR Municipal Use Planning) including road resurfacing	■ Need to consider proposed sub-transmission watermain within the Queen Street right-of-way.
Technical Environment	■ Construction truck traffic management issues during construction	■ Ease of access to haul routes and ease of truck traffic management	■ Lane closures on Queen Street will have an impact boulevards have limited availability to route traffic around compound sites.
Technical Environment	Evaluation Ranking	-	No ranking as there is no alternative routing option
Climate Change	■ Potential for greenhouse gas emission reduction measures	■ Potential for generating greenhouse gas emissions	■ Not applicable (no alternative route option)
Climate Change	■ Vulnerability of project/ infrastructure to climate change effects	■ Vulnerability of project/ infrastructure to climate change effects	■ No work in TRCA regulated areas expected
Climate Change	Evaluation Ranking	-	No ranking as there is no alternative routing option
Economic / Financial	■ Estimated construction costs	■ Relative construction costs compared to other routes	■ Expect additional cost related to shaft compounds in high traffic road allowance. ■ Potential for temporary road widening to maintain lanes to be consider thus adding to the capital costs of the project. ■ Potential for utility conflicts resulting in utility relocations or protections.
Economic / Financial	■ Estimated operations and maintenance costs	■ Potential access issues related to shaft locations and pipe depth ■ Relative operations and maintenance costs compared to other routes	■ Additional cost related to accessing shafts in high traffic right-of-way corridors
Economic / Financial	Evaluation Ranking	-	No ranking as there is no alternative routing option

6. Phase 3: Alternative Design Concepts

6.1 Overview of Phase 3

Phase 2 of the Municipal Class EA process evaluated alternative routes for the new Kennedy Road STS and identified the recommended preferred route as documented previously in Section 5 and shown below in Figure 6-1.

The objective for Phase 3 as documented in this report is to identify and evaluate alternative design concepts based on the recommended preferred STS route which includes confirmation of the preferred construction methodology as well as how alternative tunnel shaft compounds were identified and evaluated. In addition, Phase 3 will also include the confirmation of sanitary sewer alignment based on the preferred shaft compound locations, and identification of preliminary impacts and mitigation measures in addition to permitting and approvals requirements.

The alternative design concepts for the Kennedy Road STS Municipal Class EA consist of four major components of the preferred solution (i.e., preferred STS route) including:

- Construction methodology (i.e., Open-cut vs. Trenchless)
- Trenchless construction methodology (i.e., Tunnel Boring Machine vs. Micro-Tunnel Boring Machine)
- Shaft compound locations and evaluations
- Sanitary sewer alignment confirmation

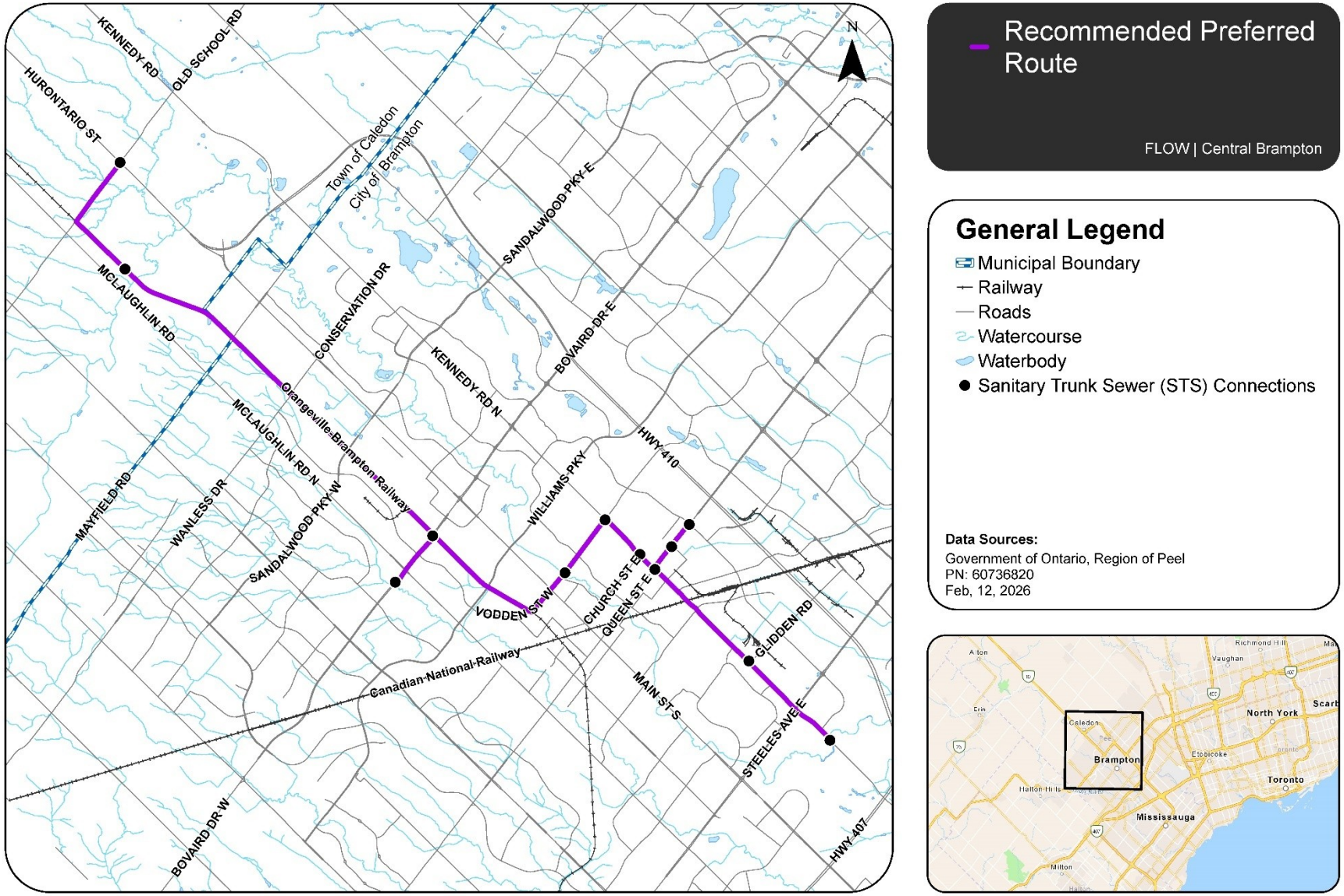
The methodology used to evaluate the alternatives of each of the four components was founded on the key decision-making principles of the Municipal Class EA process, considering technical, social/cultural, environmental, legal/jurisdictional, and financial criteria.

The evaluation was carried out as a co-ordinated assessment whereby detailed shaft site requirements were considered in conjunction with the tunnelling requirements for the sewer route.

6.2 Overview of Construction Approaches

The MCEA Planning Process recognizes there are usually multiple ways in which the preferred solution can be designed and implemented. As such, alternative design concepts were identified and evaluated based on their potential impact. Phase 3 of the MCEA process identifies and assesses design alternatives for implementing the preferred STS alignment confirmed during Phase 2. The goal of this phase is to determine the most technically feasible, environmentally sustainable, and cost-effective construction methodology to achieve the project's objectives while minimizing impacts on the community, environment, and existing infrastructure.

Figure 6-1: Recommended Preferred Route



The Kennedy Road STS will be constructed primarily as a deep gravity sewer, requiring review of both open-cut and trenchless construction methods. Given the significant depth of the proposed sewer (ranging from 10 metres to 48 metres) and the presence of many utilities and constrained rights-of-way, open-cut construction was assessed first and found to be impractical for the majority of the route. Consequently, trenchless tunnelling methods were evaluated in detail.

6.2.1 Open Cut Construction

Open-cut construction typically uses large excavators to dig a trench which is wide enough to allow the STS and bedding material to be laid down by cranes as the work proceeds along the route. To minimize the width of excavation and to provide a safe working environment for construction workers, the trench is supported with temporary shoring such as a trench box. As the STS sections are installed, the trench can be backfilled to ground level and open excavation and pipe installation progresses along the alignment.

Construction by open-cut results in localized activity in the immediate area of excavation where the STS is being installed. For example, as the trench advances along the street, open-cut construction will require temporary lane closures and/or traffic detours that advance as the STS segments are installed.

In an urban setting such as the City of Brampton, excavated material typically requires haulage off-site and suitable material (typically granular backfill) needs to be imported to backfill the trench up to the road base. Designated haul routes are required for this transport and should avoid residential streets where possible and utilize Regional or City arterial or collector roads such as Kennedy Road and Vodden Street. As sufficient backfilled trench is made available, the surface roadway can be restored on a temporary basis, allowing for its return to use. For temporary restoration, base asphalt or short-term granular base is typically used. Permanent restoration that involves placement of the asphalt road surface typically occurs once sufficient segments of the STS are complete.

The depth of the proposed STS is driven by the need to achieve a gravity sewer between the required upstream and downstream connection points within the existing wastewater system. Open-cut construction was determined not to be technically feasible given the depth of the STS profile ranges from 10 to 48 metres deep and limited right-of-way width considering the number of existing utilities within the right-of-way as well as adjacent land uses and the need to maintain traffic flow. However, it is recognized that the connections to the existing Etobicoke Creek and Fletcher's Creek STSs will involve open-cut construction method (refer to Section 2.5 for further description of connections to the STSs).

As such, alternative construction methodologies were identified and evaluated based on their potential impact. For this project, design alternatives are trenchless installation of the new STS by tunnel boring machine (TBM), or micro-tunnel boring machine (MTBM).

6.2.2 Trenchless Construction Methods

Given the above depth and corridor constraints, trenchless tunnelling methods were identified as the most viable approach for the majority of the preferred alignment. The following two trenchless methods were selected for further assessment based on anticipated ground conditions, required diameters and constructability along the preferred STS route including Kennedy Road, Vodden Street, OBR Corridor and Old School Road:

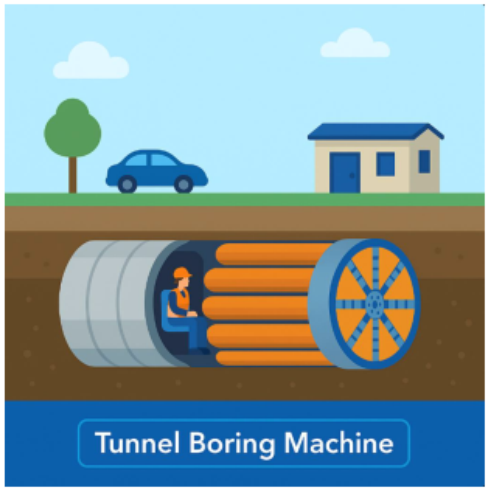
- Tunnel Boring Machine (TBM): suited for larger-diameter, longer tunnel drives in competent or mixed ground.
- Micro-Tunnel Boring Machine (MTBM): a remote-controlled pipe-jacking system suitable for smaller diameters typical of STSs.

These alternatives are described in detail in the following subsections.

6.2.2.1 Tunnel Boring Machine

A Tunnel Boring Machine (TBM) is a mechanized tunnelling system designed for the construction of large-diameter tunnels, generally exceeding 2.7 metre internal diameter. TBMs are typically used where ground conditions are stable and strong enough to safely support construction without special ground treatment. The TBM tunnels long distances between shafts which can be spaced further apart. They are controlled by an operator underground, as shown in Figure 6-2.

Figure 6-2: Tunnel Boring Machine



The system consists of a rotating cutter head that excavates the ground, while precast concrete segments can be installed sequentially behind the face to form the tunnel lining and provide immediate structural support.

Key Features

- Key features of a TBM include the requirement for launch and reception shafts to accommodate the machine assembly and facilitate spoil removal.
- When operating under proper pressurized conditions, such as Earth Pressure Balance (EPB) or slurry mode, the TBM can control face stability and significantly reduce the risk of ground loss and ground movements at and below surface level. This continuous, pressurized excavation process allows long, uninterrupted drives, typically greater than 1.5 kilometres, with only limited intermediate access shafts required. TBMs are generally best suited for such long-distance installations where the higher setup cost can be justified by production efficiency and reduced surface disruption.
- The method enables a continuous gasketed segmental lining system behind the cutter head, providing the structural lining and watertightness.

Advantages

The TBM method offers several technical and logistical advantages for deep long-distance tunnelling:

- Once mobilized, TBMs are capable of maintaining consistently high production rates, making them particularly efficient for extended drives where setup costs can be offset by continuous operation.
- TBM tunnelling minimizes surface disruption and ground loss, vibration, and noise, making it well suited for installation within densely developed urban corridors where minimizing public disturbance is a key objective.
- TBMs are also highly adaptable to different ground conditions, whether competent rock or mixed soils, through the use of customized cutterhead configurations and pressurized face control systems that maintain stability and minimize ground disruption.

Disadvantages

Despite its strengths, TBM tunnelling presents several drawbacks that limit its suitability for certain portions of the Kennedy Road STS alignment including other preferred route segments:

- This method requires substantial shaft size and setup area, especially at launch shaft, along with extensive surface staging areas to accommodate equipment, spoil handling, and segment storage, conditions that can be difficult to achieve within constrained right-of-ways.

- Mobilization and demobilization of TBM systems are also complex and costly, making this method less economical for short drives.
- TBMs are typically designed for larger diameters and more uniform alignments and are therefore less effective for smaller-diameter tunnels or where ground conditions vary significantly.
- TBM operations demand substantial electrical power supply and specialized personnel for operation and maintenance, both of which contribute to higher overall setup and operational costs compared to other trenchless methods.

For the Kennedy Road STS, the TBM method is deemed feasible for deeper and longer drives in rock formations, particularly along Kennedy Road between Etobicoke Creek and Vodden Street, where the available working area on surface is limited. A two-pass TBM configuration is being retained as an alternative for this portion of the Kennedy Road alignment. The proposed configuration consists of a precast concrete segmental lining serving as the primary tunnel support, with a concrete pressure pipe (CPP) installed as the secondary (carrier) pipe. The annulus between the precast concrete segmental lining and the CPP would be filled with a cementitious grout.

However, the large diameter of the TBM, higher setup costs, and reduced flexibility for shorter or variable-diameter drives make this method less economical for most of the remaining Kennedy Road STS alignment compared to micro-tunnelling for smaller-diameter segments. Therefore, TBM tunnelling is carried forward as a potential alternative for specific drives where site conditions or property constraints justify its use.

Surface Works: Tunnel Shafts

TBM operations require large launch and reception shafts capable of housing the TBM shield, backup gantries, and segment handling equipment. These shafts also serve as primary access points for ventilation, muck removal, and material delivery. Where possible, shafts should be located on municipal lands to minimize property impacts.

Launch shafts may also require foreshunts and backshunts to enable efficient TBM launch.

Below Ground: Works in Tunnel

Within the tunnel, the TBM advances continuously while installing precast segmental rings, typically five to seven segments per ring. Grouting is performed immediately behind the lining to fill the annular void and stabilize the surrounding ground. Utilities and drainage systems can be integrated within the segmental lining as required.

Tunnel Design Assumptions

Design assumptions for TBM tunnelling include maintaining face pressure appropriate to the in-situ stress conditions, controlling groundwater inflow through gasketed

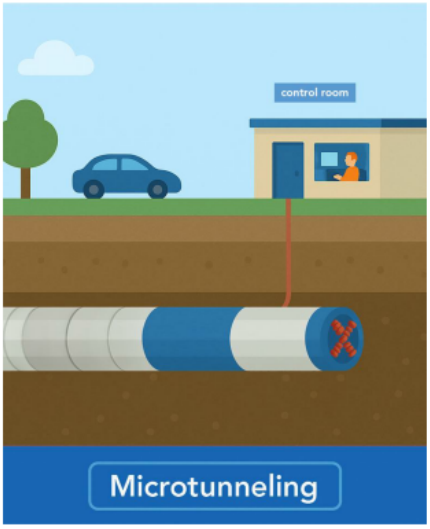
segments, and ensuring longitudinal alignment within a good range of accuracy. The design also assumes adequate geotechnical cover above the tunnel crown to prevent surface heave or collapse, typically no less than 1.5 times the tunnel diameter.

6.2.2.2 Micro-tunnel Boring Machine

A Micro-Tunnel Boring Machine (MTBM) is a remote-controlled, pipe-jacking system suitable for the construction of small- to medium-diameter tunnels, typically ranging from 0.9 metres to 3.0 metres in internal diameter. The system combines precision guidance and closed-face tunnelling to install jacking pipes that form the permanent tunnel lining as the machine advances. Excavated material is transported to the surface through a pressurized slurry circuit, which maintains face stability and minimizes ground loss, allowing tunnelling beneath sensitive structures and existing utilities with minimal surface settlement.

Compared to TBM, MTBM is typically smaller and tunnels shorter distance, requiring less space between shafts and as such more shaft compounds. They are operated from control containers located above ground.

Figure 6-3: Micro-tunnel Boring Machine



Key Features

MTBM drives are generally shorter than conventional TBM drives, with typical drive lengths between 400 metres and 1,000 metres, although drives of up to approximately 1.5 kilometres are achievable depending on ground conditions, tunnel radii, pipe diameter and jacking capacity.

Each drive requires a launch shaft, from which the MTBM and pipe string are pushed forward using hydraulic jacks, and a reception shaft for retrieval of the machine and completion of the drive.

The system can accommodate variable soil conditions, including soft ground, mixed-face, and granular materials, through the use of appropriately selected cutterheads and slurry management systems. It also allows installation below utilities and sensitive structures without major ground movements.

Advantages

The MTBM method offers several advantages for deep gravity sewer installation within urban corridors:

- It is particularly suited to constrained urban corridors and rights-of-way such as Kennedy Road, where minimizing surface disturbance and property impacts is critical.
- Compared to conventional TBM tunnelling, the MTBM system requires smaller shafts and a more compact surface setup, resulting in lower mobilization costs and easier site integration, in addition to less property. That said, impacts are more localized (e.g., dust, noise, vibration) in addition to lane restrictions in the vicinity of the shaft compound.
- The method provides excellent control of line and grade, which is essential for gravity sewers requiring tight tolerances on slope and alignment. The closed-face slurry system also enables safe and controlled excavation under existing utilities, roadways, and structures while maintaining minimal ground movement.
- Micro tunnelling by jacking CPPs enables a single pass system, which reduces excavated spoil and material consumption, and enables a shorter program for pipe installation.

Disadvantages

The MTBM method also has several disadvantages including:

- The primary limitations of the MTBM method relate to its shorter feasible drive lengths and sensitivity to ground variability.
- The presence of highly variable or mixed ground conditions can reduce productivity, increase tool wear, and necessitate more frequent interventions.
- Compared to a full-scale TBM, the MTBM's jacking distance is constrained by the allowable compressive capacity of the pipe and the total jacking force achievable from the shaft, which limits the practical drive length.

- Additional intermediate shafts may therefore be required to maintain progress along extended alignments, leading to an increased number of surface work areas and associated local impacts.
- An increased number of shafts increases the mobilization and demobilisation times thus potential negative impacts to the project schedule and abutting property owners.
- An increased number of shafts remaining open for longer period of time. Peel's pressure testing requirements will result in a delay in completing pipe segments and backfilling shafts. This will lead to longer impacts at each location.
- An increased number of shafts in close proximity to residential homes may result in construction fatigue due to duration of works at these shaft locations.

Despite these constraints, MTBM remains the most practical and cost-effective solution for deep sewers in urban settings where surface access is limited and smaller diameters are required.

Given the anticipated tunnel depths of 10 metres to 48 metres and the constrained corridor conditions along Kennedy Road and Vodden Street, MTBM has been identified as the preferred trenchless technology for this project from a technical perspective. Its ability to achieve precise grade control, operate safely at significant depth, and accommodate multiple intermediate shafts makes it particularly suitable for the planned 1.5 metres to 2.1 metres internal diameter STS. MTBM also provides flexibility to segment the alignment into multiple manageable drives, minimizing the need for large construction compounds while maintaining efficient progress and safety.

Surface Works: Tunnel Shafts

Each MTBM drive requires a pair of shafts, one for launching and one for reception. Shafts could be constructed by using secant piles, segmental lining, sprayed concrete, cast in situ concrete or by a combination of rock bolts and mesh. The shafts are sized to accommodate the jacking frame, slurry lines, and pipe handling equipment. Shaft locations are selected to minimize property and traffic impacts while providing adequate spacing for micro tunnelling operations. Excavated material is processed and removed at the launch shaft through a slurry separation plant.

Below Ground: Works in Tunnel

During tunnelling, the MTBM is remotely operated from the surface control cabin, advancing through the ground while simultaneously jacking the permanent pipes behind the MTBM. The pressurized face prevents ground loss, and the slurry system continuously removes excavated material. Steering corrections are made through the control system to maintain the designed alignment and gradient. Annular grouting is be

performed after completion of the bore to fill any voids between the excavated ground and the installed pipe.

Tunnel Design Assumptions

Design of MTBM drives assumes uniform advance rates based on ground conditions and pipe size, with maximum jacking forces established according to pipe strength and alignment geometry. A minimum cover of approximately 1.5 times the external pipe diameter is maintained to ensure ground stability above the tunnel crown. The alignment design also accounts for allowable deflection limits, joint tolerances, and lubrication requirements to reduce frictional resistance during jacking.

6.3 Alternative Sanitary Trunk Sewer Construction Methods

To facilitate the evaluation of the construction methodology and identification and evaluation of shaft locations, the recommended preferred route was divided into 3 segments as shown below and in Figure 6-4:

- Segment 1: Kennedy Road from Etobicoke Creek to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road (approximately 5.8 kilometres). Although the Queen Street section was included in this EA, during the implementation phase, the segment along Queen Street will be implemented separately from the main project as Queen Street Sanitary Trunk Sewer.
- Segment 2: Vodden Street to Bovaird Drive from Kennedy Road (approximately 3.8 kilometres) partly along Vodden Street and then along the Orangeville-Brampton Railway (OBR) corridor to Bovaird Drive; Bovaird Drive, OBR to Fletcher's Creek (approximately 900 metres) and also includes diversion chambers and connection at existing Etobicoke Creek and Fletcher's Creek Sanitary Trunk Sewers.
- Segment 3: OBR corridor Bovaird Drive to Old School Road and Old School Road from OBR to Hurontario Street (approximately 8.7 kilometres).
- Total alignment length: ~19 kilometres.

The segmentation considers availability of land, constructability, conflicts with existing utilities, public and traffic impacts, required system connections, and local environmental sensitivities. In addition, the evaluation incorporates geotechnical and hydrogeological conditions, tunnelling methodology constraints, drive-length limitations, shaft siting feasibility, property and easement requirements, corridor access, risk to adjacent infrastructure and future operation. The primary constraints with respect to the constructability for each segment are summarized in Table 6-1.

Figure 6-4: Phase 3 Preferred Route Segment Map

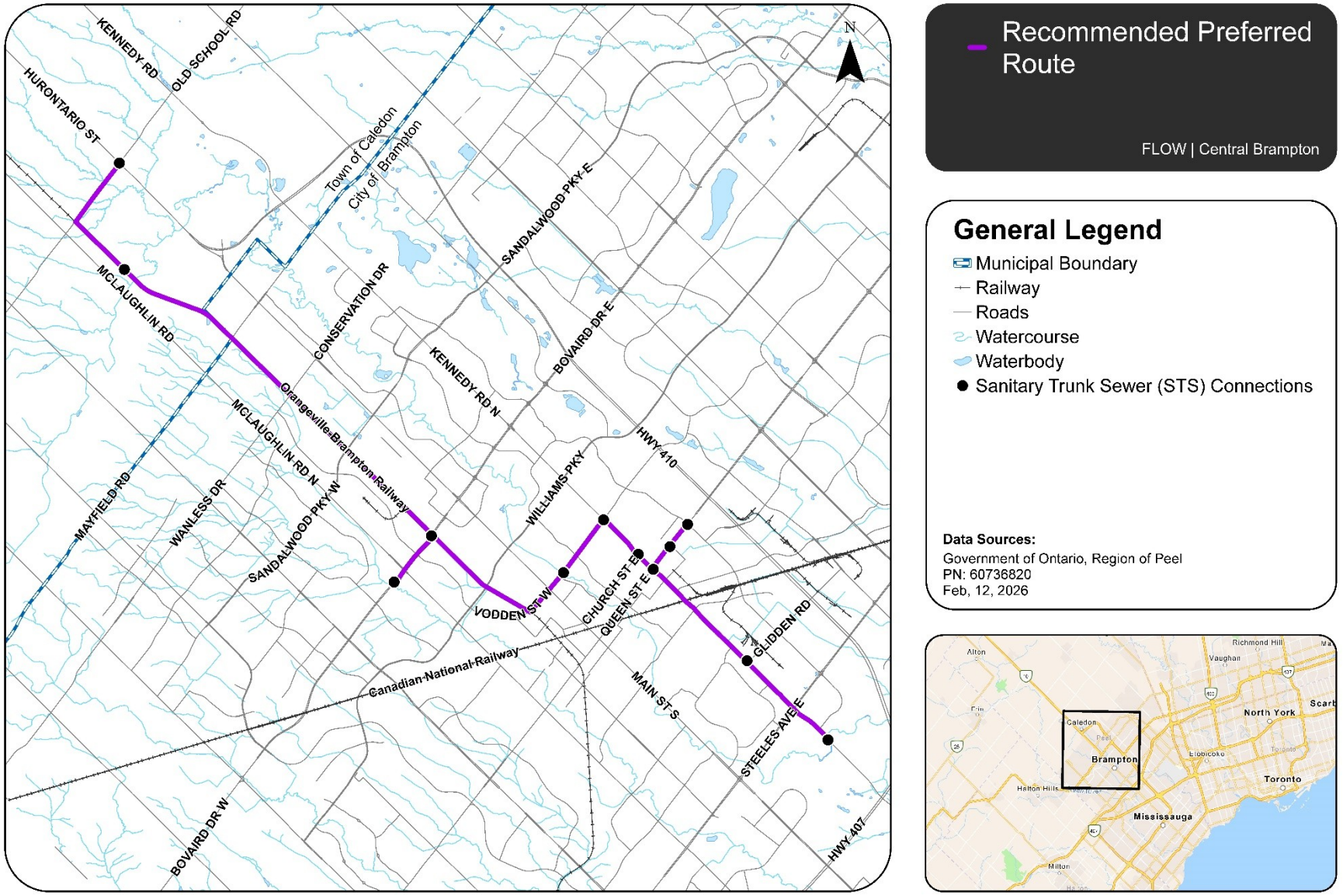


Table 6-1: Primary Constraints and Likely Construction Methods by Segment

Segment	Limits	Primary Constraints	Likely Construction Method
1	■ Kennedy Road from Future ECTS to First Gulf Boulevard (2,100 millimetre Internal Diameter STS)	■ Significant work in Etobicoke Creek floodplain; high utility density; limited ROW, limited working area	■ Trenchless (MTBM/TBM) or Sequential Excavation Method (SEM) (due to the short distance and tight curve in this section)
1	■ Kennedy Road from First Gulf Boulevard to Vodden Street (2,100 millimetres and 1,800 millimetre Internal Diameter STS), including Queen Street from Rutherford Road to Kennedy Road (1,200 millimetres)	■ Businesses premises ■ Institutions (i.e., schools) ■ Utilities ■ Kennedy Road traffic lanes	■ Trenchless (MTBM or TBM)
2	■ Vodden Street from Kennedy Road to OBR and OBR to Bovaird Drive and along Bovaird Drive to Fletcher's Creek (1,800 millimetres and 1,500 millimetres Internal Diameter STS)	■ Surface utility conflicts; proximity to residential/ commercial areas ■ Traffic along Vodden Street and Bovaird Drive	■ Trenchless (MTBM) with localized open-cut connections
3	■ OBR from Bovaird Drive to Old School Road and Old School Road to east of Hurontario Street (1,500 millimetres Internal Diameter STS)	■ Mixed urban / industrial corridor; proximity to single family residential areas	■ MTBM up to 1,000 metres drive

6.3.1 Kennedy Road from future Etobicoke Creek Trunk Sewer (ECTS) to First Gulf Boulevard

This section connects the southernmost shaft on Kennedy Road with the future ECTS. Open-cut excavation was ruled out due to excessive depth (> 10 metres) and traffic disruption. MTBM is the preferred method though alternatively TBM or sequential excavation method (SEM) may be used due to the short length and tight curve in this segment.

It is important to note that following review of the interface with the future ECTS, the Project Team identified a new shaft compound at Kennedy Road and First Gulf Boulevard, just north of the previously identified connection shaft at the future ECTS. The introduction of this new shaft compound minimizes conservation authority permitting risks and approval timelines, in addition to avoiding long lane closures along Kennedy Road and Etobicoke Creek trail closures. It also shortens construction duration and minimizes utility relocations.

6.3.2 Segment 1: Kennedy Road from First Gulf Boulevard to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road

This section traverses deep ground conditions beneath existing utilities along the Kennedy Road. Open-cut excavation was ruled out due to excessive depth (> 20 metres) and traffic disruption. MTBM is the preferred method though alternatively tunnelling by TBM may be used. Shaft compounds will be located on City right of ways where access and staging are feasible and may also use adjacent lands on a temporary basis to facilitate construction.

The sewer branch along Queen Street, from Rutherford Road to Kennedy Road, will be constructed by micro tunnelling using an MTBM. Use of a TBM is not considered optimal and the alignment is too deep for open cut to be considered feasible.

6.3.3 Segment 2: Vodden Street from Kennedy Road to OBR and from OBR up to Bovaird Drive, and along Bovaird Drive to Fletcher's Creek

This section follows Vodden Street and intersects multiple utilities and local sewers. MTBM is preferred for the mainline installation. Drives will be limited to approximately 900 metres to limit the jacking forces required to overcome the friction on the pipe string.

Short open-cut connections are anticipated for the connection to the existing Etobicoke Creek sanitary sewer as well as diversion chamber construction. This also applies to the connection to the existing Fletchers Creek sanitary sewer and diversion chamber construction.

6.3.4 Segment 3: OBR from Bovaird Drive up to Old School Road and Old School Road to east of Hurontario Street

The northern section runs along the OBR corridor where available working area is greater. MTBM is recommended for the drive lengths of approximately 700 to 1,200 metres. It is noted that in some cases access to shaft compounds will require equipment

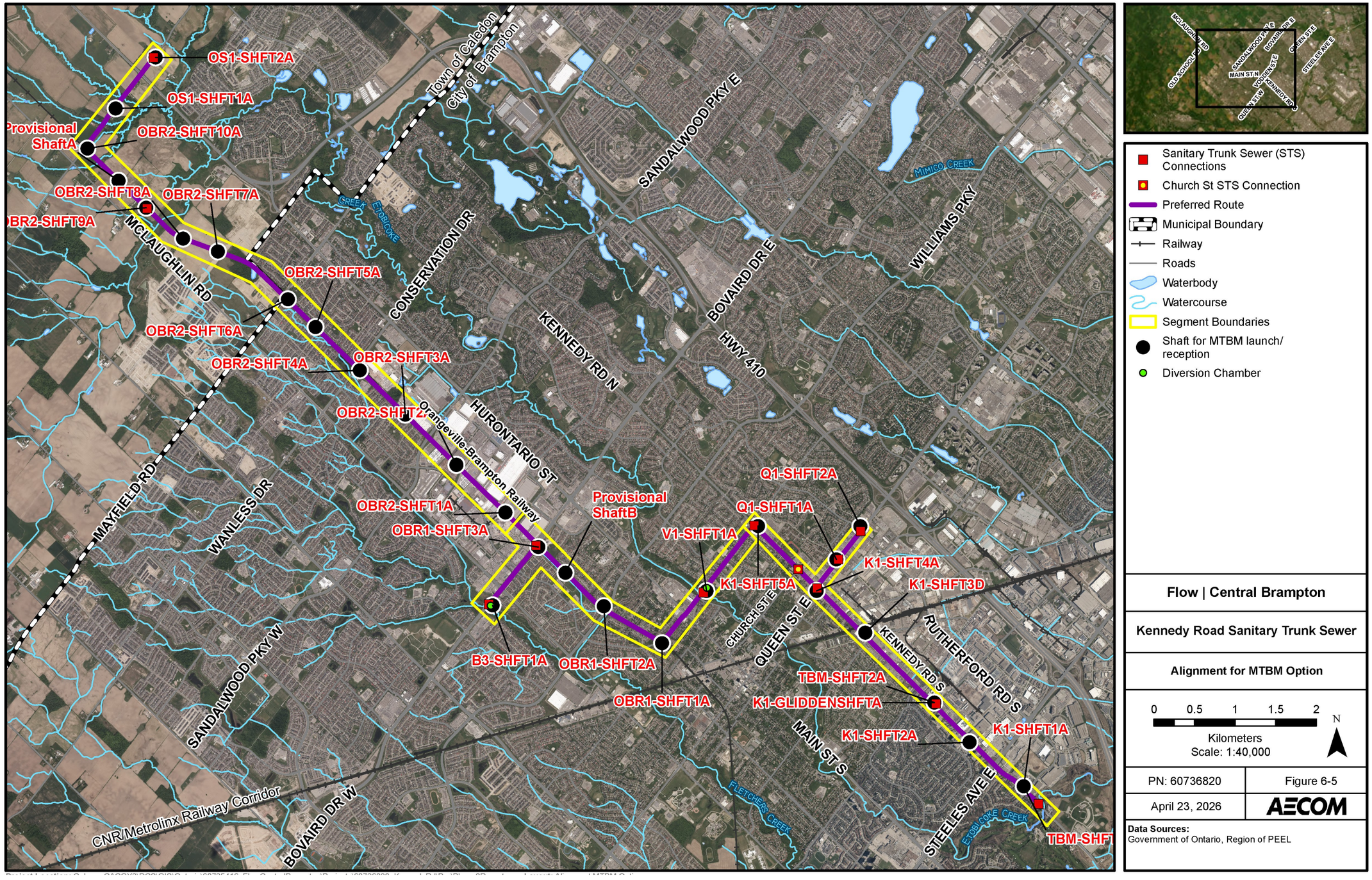
running through the shaft compounds to the north or south which may present constructability constraints. This will be addressed in detailed design.

6.4 Connections to Sanitary Trunk Sewers

The following key connections to existing and future sewer infrastructure are required as listed below and shown on Figure 6-5. These connections will be formed either by open-cut or by trenchless methods.

- South connection to future ECTS at Kennedy Road (further described in Section 6.4.1).
- Connection to future Glidden Road STS at Kennedy Road.
- Connections along Queen Street at Hansen Road and at Rutherford Road from the Kennedy Road STS. The sewer on Queen Street will be constructed by micro-tunnelling due to the relatively short drive lengths.
- Connection at Church Street. This connection may be formed by placing a future shaft at the intersection of Church Street and Kennedy Road. Alternatively, there may be an opportunity to make this connection at the proposed shaft at the intersection of Queen Street and Kennedy Road, but this is to be determined. The Church Street connection will be determined through the recently initiated Flow Downtown Brampton Water and Wastewater Servicing Environmental Assessment.
- Connection to existing Etobicoke Creek Trunk Sewer on Vodden Street which will also include a diversion chamber that can split flows between the ECTS and the proposed Kennedy Road STS.
- Connection to existing Fletchers Creek Trunk Sewer (FCTS) on Bovaird Drive (west of McLaughlin Road) which will also include a diversion chamber that can split flows between the FCSTS and the proposed Kennedy Road STS. The length of sewer along Bovaird Drive from Fletchers Creek to the OBR will be constructed by micro-tunnelling due to its relatively short drive length.
- Hurontario Employment Area future connection on the OBR north of Mayfield Road.
- Future Street A connection from Mayfield West development on OBR south of Old School Road.
- North STS connection at Hurontario and Old School Road which will capture flow from the Dougall Sanitary Sewer Pumping Station Service Area which also includes Hurontario Employment Area (north of Old School Road) future connection.

Figure 6-5: Key Connections to Existing and Future Sewer Infrastructure



Sanitary Trunk Sewer (STS) Connections
Church St STS Connection
Preferred Route
Municipal Boundary
Railway
Roads
Waterbody
Watercourse
Segment Boundaries
Shaft for MTBM launch/ reception
Diversion Chamber

Flow | Central Brampton

Kennedy Road Sanitary Trunk Sewer

Alignment for MTBM Option

0 0.5 1 1.5 2
Kilometers
Scale: 1:40,000
N

PN: 60736820	Figure 6-5
April 23, 2026	AECOM

Data Sources:
Government of Ontario, Region of PEEL

6.4.1 South Connection to Future Etobicoke Creek Sanitary Trunk Sewer at Kennedy Road

A shaft at the southern end of the proposed Kennedy Road STS has been introduced at First Gulf Boulevard. The pipe between this shaft and the future ECTS at Etobicoke Creek will be installed either by micro tunnelling with an MTBM, or by sequential excavation method (SEM). This drive would be launched from the Kennedy STS shaft at First Gulf Boulevard and received at the future ECTS shaft at Etobicoke Creek.

Information on the future ECTS shaft at Etobicoke Creek is as follows:

- This shaft is designed as an 8 metre internal diameter structure for TBM or MTBM retrieval and includes a baffle drop structure and a large diversion chamber (DC-1) to transition flows from existing 1,050 millimetre sewers to the proposed 2,100 millimetre ID ECTS.
- The site is situated within the Kennedy Road right of way, adjacent to steep, vegetated slopes in the Etobicoke Creek vicinity.
- The shaft compound location was selected to minimize utility relocations and avoid extensive grading and retaining wall construction on City of Brampton lands.
- The site falls within the TRCA regulatory area and partially within the floodplain, requiring additional permitting and co-ordination efforts.
- Construction at this future ECTS shaft 1 will necessitate temporary lane closures, which have been discussed with the City of Brampton and during public information sessions.
- The site and shaft are sufficient for TBM or MTBM retrieval but lack sufficient space for TBM or MTBM launch without significant additional impacts to the creek area or traffic. In addition, timing constraints are potentially limiting factor as construction of the baffle structure will be a key piece needed for commissioning of the ECTS.

Thus, the following negative aspects for using the future ECTS shaft as an interface point between the future ECTS and the Kennedy STS were determined.

- Prolonged construction duration and extended lane closures along Kennedy Road, with potential impacts to the Etobicoke Creek Trail.
- Increased permitting and approval risks due to TRCA regulatory constraints.
- Potential need to enlarge the future ECTS shaft at Etobicoke Creek to accommodate TBM launch/retrieval, leading to greater construction limits and utility relocations.

- Elevated schedule risks, particularly related to commissioning and diverting existing flows via DC-1, which is a critical path activity. Interface delays could impact this work.

As such the interface point between the future ECTS and the Kennedy STS was moved to the Kennedy STS shaft at First Gulf Boulevard, with the following benefits.

- The location at First Gulf Boulevard offers a larger working area and avoids the need for a complex diversion structure.
- This shift removes the interface from the critical path of both projects, providing greater scheduling flexibility.
- It enables the Kennedy Road STS project to explore alternative tunnelling methodologies, including uphill boring and different TBM technologies.
- The short (~250 metres) connection from the new interface point to Shaft 1 can be constructed using MTBM methods already planned for ECTS.
- The detailed design will further refine shaft location, sizing, and construction sequencing between the two projects.

6.4.2 Connection to Existing Etobicoke Creek Sanitary Trunk Sewer at Vodden and Diversion Chamber

The exiting ECTS intersects Vodden Street at Etobicoke Creek. A diversion chamber to form the connection with the existing 1,200 millimetre diameter ECTS has been positioned on Vodden Street, between Duggan Park and Ken Whillans Drive, adjacent to the location of shaft V1-SHFT1. The diversion chamber is positioned offline from the Kennedy Road STS to enable this connection to be constructed offline.

A 1,200 millimetre internal diameter pipe will connect the flows from this diversion chamber to the Kennedy Road STS, connecting at shaft V1-SHFT1.

6.4.3 Connection to Existing Fletcher's Creek Sanitary Trunk Sewer and Diversion Chamber

A diversion chamber connecting the existing 1,200 millimetre diameter West Trunk System (Fletcher's Creek STS) has been positioned on Bovaird Drive at McLaughlin Valley, adjacent to the location of shaft B3-SHFT1. The diversion chamber is positioned offline from the Kennedy Road STS to enable this connection to be constructed offline.

A 1,200 millimetre internal diameter pipe will connect the flows from this diversion chamber to the Kennedy STS, connecting at shaft B3-SHFT1.

6.4.4 Connection to Future Glidden Road Sanitary Trunk Sewer at Kennedy Road

The design incorporates a future connection to the Glidden Road STS. A shaft (shaft K1-GLIDDEN SHFT) has been positioned on the north side of the intersection of Kennedy Road and Glidden Road. The future Glidden Road STS will connect with the Kennedy Road STS at this shaft.

6.4.5 Connection to Future Church Street Sanitary Trunk Sewer at Kennedy Road

The design incorporates a future connection to the Church Street STS. There are provisions for a future shaft (by others) at the south side of the intersection of Kennedy Road and Church Street. From this shaft, a future secondary horizontal connection (by others) will connect flows from the future Church Street STS to the Kennedy Road STS which will require a manhole at this connection point.

6.5 Overall Recommended Sewer Construction Method

The following subsections describe the recommended construction methodology for each route segment.

6.5.1 Segment 1: Kennedy Road from First Gulf Boulevard to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road

The recommended construction method for Segment 1 is micro-tunnelling using an MTBM for the entire sewer alignment along Kennedy Road from Etobicoke Creek to Vodden Street. This method will be developed for the preliminary design.

However, as an alternative, tunnelling using a TBM is also feasible for construction of the sewer alignment along Kennedy Road and this option will also be developed for the preliminary design, in parallel with the MTBM method. As such, both options will be further considered in the detailed design phase.

The pipe between the shaft at First Gulf Boulevard and the future ECTS trunk sewer can also be constructed by sequential excavation method (SEM) which is a tunnel and underground excavation technique in which the ground is excavated in small, carefully controlled stages, and temporary support is installed immediately after each stage to maintain stability. The production rate for a 3,000 millimetre diameter tunnel is approximately 5.0-10.0 metres per day using a roadhead and ribs and lagging for

temporary support. The method for this approximately 225 metre length of sewer will be confirmed as part of the detailed design.

To reduce the number of maintenance holes along the Kennedy Road corridor, both TBM and MTBM options were evaluated for the proposed 2,100 millimetre STS from the ECTS shaft to the intersection of Kennedy Road and Vodden Street.

For this section, MTBM has been identified as the preferred option, as it achieved a higher overall score against the evaluation criteria presented in Table 6-2. However, the two-pass TBM option is being retained for consideration for longer drives in Segment 1, where elimination of two intermediate maintenance holes may provide operational disadvantages due to long distances between the maintenance holes.

In accordance with the Region of Peel's Linear Wastewater Standards (December 2025), single-pass TBM construction using precast concrete segments is not permitted. Therefore, the only feasible TBM configuration is a two-pass system consisting of:

- Excavation of a 3,200 millimetre ID tunnel with temporary segmental lining
- Installation of a 2,100 millimetre ID C30X carrier pipe within the tunnel
- Grouting of the annular space between the carrier pipe and tunnel lining

Although the two-pass TBM system is more costly than single-pass micro-tunnelling, it may allow elimination of two intermediate shafts along Kennedy Road.

Use of a rock boring machine with temporary ground support (rock bolts, mesh, and shotcrete) would require additional easement width due to rock bolt installation. Accordingly, a segmentally lined tunnel has been assumed to minimize property encroachment.

Installation of the 2,100 millimetre carrier pipe requires large launch and reception shafts to accommodate:

- TBM assembly and starter/tail tunnels
- Carrier pipe handling and installation operations from launch shafts
- Muck removal logistics

Under the TBM option, 12 metre internal diameter launch and reception shafts are recommended at Kennedy Road/First Gulf Boulevard and Kennedy Road/Vodden Street. The contractor would retain flexibility to select uphill or downhill tunnelling based on means and methods.

Based on Decast's Concrete Pressure Pipe Installation Guide, installation of a 2,100 millimetre CPP carrier pipe (6.1 metre segments) with deep bell and spigot joints requires a minimum curvature radius of 459 metres to allow for standard joint deflection Accordingly, the tunnel alignment has been designed with a minimum horizontal curvature of 500 metres.

Under the two-pass TBM configuration, maintenance holes cannot be constructed directly above the tunnel and must instead be constructed offline and connected via adit structures which is costly. Offline drop structures will also be required to accommodate future flow connections.

Given the operational, geometric, constructability, cost, and schedule constraints associated with the two-pass TBM approach, the design team recommends the MTBM option for this project.

The MTBM method:

- Minimizes construction footprint in the urban corridor, however, requires more properties/areas related to increased number of shaft compounds
- Reduces overall cost and schedule duration
- Lowers flooding risk exposure
- Improves worker safety conditions (no-man entry)
- Better aligns with maintenance hole spacing requirements

Also, a critical component of Segment 1 is the connection between the proposed Kennedy Road STS and the future ECTS at Kennedy Road and Etobicoke Creek.

This connection may be constructed using:

- The Sequential Excavation Method (SEM) with temporary support and installation of a 2,100 millimetre carrier pipe as the permanent structure; or
- Micro-tunnelling, if a soft eye is incorporated into the ECTS shaft.

Coordination with the designers responsible for the Etobicoke Creek shaft is ongoing. The final construction methodology (SEM or micro-tunnelling) will be confirmed during the detailed design phase.

The sewer branch along Queen Street, from Rutherford Road to Kennedy Road, will be constructed by microtunnelling using an MTBM.

6.5.2 Segment 2: Vodden Street from Kennedy Road to OBR and from OBR up to Bovaird Drive, and along Bovaird Drive to Fletcher's Creek

The recommended construction method for Segment 2 is micro tunnelling using an MTBM. Following an evaluation, this method is considered more suitable than tunnelling using a TBM.

The sewer branch along Bovaird Road, from Fletchers Creek to the OBR, will be constructed by micro tunnelling using an MTBM.

6.5.3 Segment 3: OBR from Bovaird Drive to Old School Road and Old School Road to east of Hurontario Street

The recommended construction method for Segment 3 is micro tunnelling using an MTBM. Following an evaluation, this method is considered more suitable than tunnelling using a TBM.

The sewer branch along Old School Road, from Fletchers Creek to the OBR, will be constructed by micro tunnelling using an MTBM.

6.5.4 Overall Recommended Sewer Construction Method

The overall recommended method for construction of the Kennedy Road STS is MTBM for the entire alignment. However, there is flexibility to switch to TBM for segment 1 along Kennedy Road. And there is flexibility to switch to SEM for the connection between the shaft at First Gulf Boulevard and the future ECTS shaft at Etobicoke Creek.

The overall recommended construction methodology evaluation is summarized below in Table 6-2:

Table 6-2: Construction Methodology Evaluation Summary

Evaluation Category	Evaluation Criteria	Indicators	Segment 1:		Segment 2:		Segment 3:	
			TBM	MTBM	TBM	MTBM	TBM	MTBM
Technical	Tunnelling Considerations	Tunnel diameter	○	●	○	●	○	●
		Tunnel drive length and number of shafts	●	◐	●	◐	●	◐
		Shaft sizes and compound sizes	●	●	◐	●	●	◐
	Geotechnical & Hydrogeological	Versatility and different ground conditions	●	●	○	●	○	●
	Tunnelling considerations	Presence of gases	○	●	○	●	○	●
	Construction access	Ease of accessing shaft locations	●	●	●	●	●	◐
	Schedule	Project duration	●	●	◐	●	◐	●
Economic / Financial	Construction cost	Construction cost	◐	●	◐	●	◐	●
		Ease of maintenance; Ops and maintenance costs	◐	●	◐	●	◐	●

Evaluation Category	Evaluation Criteria	Indicators	Segment 1:		Segment 2:		Segment 3:	
			TBM	MTBM	TBM	MTBM	TBM	MTBM
Natural Environment	Potential effects on fish and fish habitat	Disruption to fish and fish habitat (e.g., in-water works)	●	●	●	●	●	●
	Potential effects on terrestrial features	Loss of or disruption to natural heritage features	●	●	●	◐	○	◐
	Potential effects on SAR and SAR habitat	Loss of disturbance to SAR or their habitats	●	●	●	◐	○	◐
	Contaminated lands	Proximity to areas of potential environmental concern	●	◐	●	●	●	◐
	Groundwater impacts	Impacts to groundwater levels resulting from tunnelling in rock	◐	●	◐	●	◐	●
Socio-Economic Environment	Number of potentially impacts sensitive receptors during construction	parks, high traffic commercial areas, residential areas	◐	○	●	◐	◐	●
	Traffic and active transportation impacts during construction	Expected number of open lanes during construction; impact on bike lanes and sidewalks; inconvenience	●	◐	●	◐	●	●
	Potential impacts on public transit during construction	Impact on potential lane closures	●	◐	●	◐	●	●
	Potential impact on agricultural operations	Impacts on Canada Land Inventory 1-3 Prime agricultural lands	●	●	●	●	◐	◐
Cultural Environment	Potential for loss or disturbance to potential archaeological resources	Areas requiring future archaeological assessment (e.g., Stage 2 AA)	◐	◐	◐	◐	◐	◐
	Impacts on built heritage and cultural heritage landscapes	Loss of or disruption to built heritage resources and cultural heritage landscapes	●	●	●	◐	●	◐

Evaluation Category	Evaluation Criteria	Indicators	Segment 1:		Segment 2:		Segment 3:	
			TBM	MTBM	TBM	MTBM	TBM	MTBM
Legal/ Jurisdictional	Property requirements	Number of permanent and temporary easements	◐	◐	◐	◐	●	◐
Climate Change	Climate change mitigation	Potential for generating green house gas emissions	◐	◐	◐	●	◐	●
	Climate change mitigation	Vulnerability of infrastructure projects/ infrastructure to climate change effects (e.g., flooding)	●	●	●	◐	◐	●
Overall Evaluation			●	●	◐	●	◐	●

Legend: ● = 1 point (Preferred) ◐ = 0.5 point (Less Preferred) ○ = 0 point (Least Preferred)

A detailed evaluation of the construction methodologies is included in **Appendix L1**.

Section 7 will cover the evaluation of the tunnel shaft compound alternative locations considered based on the preferred route alignment and method of construction.

7. Evaluation of Tunnel Shaft Alternatives

In Phase 3 of the Class EA process, conceptual shaft compound locations were identified considering micro-tunnelling shaft compound spacing (to limit drive lengths to approximately 1.2 kilometres or shorter) and alternative sites were assessed based on high level criteria including minimum site size and proximity to key existing trunk sewers to facilitate connection, in addition to impacts on the overall environment. Given the number of possible shaft compound siting options, a long- list of options was developed using a four-step process described below.

7.1 Shaft Evaluation Methodology and Long List Screening

A four-step process was followed to arrive at a short list of alternative TBM shaft compounds that will be subject to detailed evaluation as part of the Phase 3 MCEA process:

1. Identify MTBM compound siting areas is based on anticipated drive length, maximum approximately 1.2 kilometres between shafts, for the size and type of MTBM machine and supporting equipment. The minimum radius is 400 metres for potential curved portions of the micro-tunnel. A total of 25 siting areas were identified along the preferred Sanitary Trunk Sewer corridor.
2. Identify a long list of siting options using a siting area based on available open-space areas and minimum compound size for launch and reception shafts ranging from approximately 1,000 m^2 to 4,650 m^2.
3. Screen the long list of siting options considering constructability (e.g., availability of land, conflict with existing utilities, conflict with drainage infrastructure, difficult co-ordination with adjacent infrastructure projects, significant impacts to traffic along Kennedy Road). The screening resulted in some areas only having one siting option, as there were no longer any viable alternatives. In this case, the siting area with only one option did not proceed to the full detailed Phase 3 evaluation. Alternatives that were screened out from the long list are shown in red text.
4. Complete a full Phase 3 evaluation of the short list siting options and identify recommended siting options.

Table 7-1 provides a summary of the long-list screening and identifies the shortlisted shaft compounds that were carried forward to the detailed evaluation.

Table 7-1: Long List Shaft Compound Screening Table

Siting Area	Description	Screening
Siting Area 1) K1-SHFT1: Connection to Etobicoke Creek Trunk Sewer	K1-SHFT1A – Kennedy Launch Shaft K1-SHFT 1A is now at northeast corner Kennedy Road and First Gulf Blvd, in front of the Turner Fenton Secondary School. Micro tunnelling from this shaft to Etobicoke Creek is faster, quicker and safer for this short section.	■ Only viable alternative that allows for traditional mining or micro tunnelling from this shaft to Etobicoke Creek Trunk Sewer at Kennedy Road and Etobicoke Creek. Will be the preferred site.
	K1-SHFT1B – An alternative location in front of the Turner Fenton Secondary School (north of K1-SHFT1A).	■ K1-SHFT 1B was screened as it will cause more disruption to school access. ■ The smaller compound area of K1-SHFT1B is not workable. ■ Remove from evaluation.
Siting Area 2) K1-SHFT2: Kennedy Road at Rambler Drive	K1-SHFT 2A – Sir Wilfrid Laurier Public School (Soccer Field)	■ Carry forward
	K1-SHFT 2B – ASL Global Logistics, AMOR Shipping and Receiving and Autobahns Freight Lines Ltd.	■ Carry forward
	K1-SHFT 2C – Alectra Corporate Headquarters and Works Yard	■ Screened out due to because of construction works and new structures by Alectra.
	K1-SHFT 2D – Townhouse Corporation Condominium	■ Carry forward
	K1-SHFT 2E - RONA Building Supplies	■ Carry forward
Siting Area 3) Glidden Road connection	MTBM/TBM Connection Shaft A	■ Carry forward
	MTBM/TBM Connection Shaft B	■ Screened out due to size of working area not being sufficient and lack of easement availability
Siting Area 4) K1-SHFT3: Kennedy Road South at Research Road	K1-SHFT3A – Tim Hortons Plaza	■ Carry forward
	K1-SHFT3B – JAGJIT Textiles and National Auto Repair	■ Carry forward
	K1-SHFT3C – Kennedy Square Mall	■ Carry forward
	K1-SHFT3D – The Brick; R&R Furniture and Mattress; Royal Furniture	■ Carry forward
	K1-SHFT3E – Brampton Cash and Carry	■ Screened out due to existing overhead hydro lines and utilities
Siting Area 5) K1-SHFT4: Kennedy Road South at Queen Street East	K1-SHFT4A – Shoppers Drug Mart- Connection shaft	■ Carry forward
	K1-SHFT4B – KFC- Connection shaft	■ Carry forward
Siting Area 6) K1-SHFT5: Kennedy Road South at Vodden Street East	K1-SHFT5A – Centennial Mall (Connection shaft)	■ No alternative as there is no open space ■ Removed from evaluation ■ Will be the preferred site
Siting Area 7) Q1-SHFT1: Queen Street East at Hansen Road	Q1-SHFT1A – Blinds To Go and Dulux Paints (northwest corner Hansen Road and Queen Street) - Connection shaft	■ Carry forward
	Q1-SHFT1B – Scotiabank Plaza (northeast corner Hansen Road and Queen Street) - Connection shaft	■ Carry forward
Siting Area 8) Q1-SHFT2: Queen Street East at Rutherford Road North.	Q1-SHFT2A – Vacant Property (northeast corner Rutherford Road and Queen Street)- Connection shaft	■ Carry forward
	Q1-SHFT2B – AutoPark Brampton (Car Dealership, northwest corner Rutherford Road and Queen Street)- Connection shaft	■ Carry forward
Siting Area 9) V1-SHFT1: Vodden Street East near Ken Whillans Drive	V1-SHFT1A – Etobicoke Creek/Duggan Park south side of Vodden Street _Connection shaft, Diversion Chamber	■ Carry forward
	V1-SHFT1B – North side of Vodden Street across from Duggan Park_ Connection shaft_ Diversion Chamber	■ Carry forward
Siting Area 10) OBR1-SHFT1: OBR at Vodden St W.	OBR1-SHFT1A – Nancy McCredie Park	■ Carry forward
	OBR1-SHFT1B – Vodden Park	■ Carry forward
Siting Area 11) OBR1-SHFT2: OBR at Williams Parkway	OBR1-SHFT2A – Armbro Park	■ Carry forward
	OBR1-SHFT2B – south side of Williams Parkway at OBR - Burton Park	■ Carry forward in case co-ordination problems with Region watermain project that will utilize Ambro Park

Siting Area	Description	Screening
Siting Area 12) OBR1-SHFT3: OBR at Bovaird Drive West	Provisional Shaft B	■ No alternative available ■ Removed from evaluation
	OBR1-SHFT3A – south side of Bovaird Drive, west side of OBR	■ No alternative available ■ Remove from evaluation ■ Will be the preferred site
	OBR1-SHFT3B – south side of Bovaird Drive, east side of OBR	■ Not constructable. ■ Screened out due to conflict with SWMF outlet to OBR drainage ditch No alternative ■ Remove from evaluation
Siting Area 13) B3-SHFT1: Bovaird Drive West at Fletchers Creek	B3-SHFT1A – South side of Bovaird Drive at Fletchers Creek Future connection Diversion Chamber	■ Carry forward
	B3-SHFT1B – North side of Bovaird Drive at Fletchers Creek_ Future connection Diversion Chamber	■ Carry forward
Siting Area 14) OBR2-SHFT1: OBR 500 metres north of Bovaird Drive West (no alternative)	OBR2-SHFT1A – Van Kirk Drive Rail Spur – No alternative	■ No alternative available ■ Removed from evaluation ■ Will be the preferred site
Siting Area 15) OBR2-SHFT2: OBR 500 metres south of Sandalwood Parkway (No alternative	OBR2-SHFT2A – No alternative	■ No alternative available ■ Removed from evaluation ■ Will be the preferred site
Siting Area 16) OBR2-SHFT3: OBR 500 metres north of Sandalwood Parkway (No alternative)	OBR2-SHFT3A – No alternative	■ No alternative available ■ Removed from evaluation ■ Will be the preferred site
Siting Area 17) OBR2-SHFT4: OBR at Wanless Drive	OBR2-SHFT4A – Burnt Elm Park	■ No alternative available ■ Remove from evaluation ■ Will be the preferred site
	OBR2-SHFT4B – Brampton Brick Not feasible due to watercourse on east side of OBR	■ Not constructable. ■ Screened out due to storm outfall on east side of OBR
Siting Area 18) OBR2-SHFT5: OBR 500 metres north of Wanless Drive	OBR2-SHFT5A – No alternative	■ No alternative available ■ Removed from evaluation ■ Will be the preferred site
Siting Area 19) OBR2-SHFT6: Mayfield Road at OBR	OBR2-SHFT6A – South side of Mayfield Road (Chinguacousy Lions Water Tower Park)	■ Carry forward
	OBR2-SHFT6B – North Side of Mayfield Road	■ Carry forward
Siting Area 20) OBR2-SHFT7: OBR 500 metres east of McLaughlin Road	OBR2-SHFT7A – North side of Tim Manley Ave.	■ Carry forward
	OBR2-SHFT7B – South side of Tim Manley Ave.	■ Carry forward
Siting Area 21) OBR2-SHFT8: OBR 300 metres east of Mclaughlin Road	OBR2-SHFT8A – South of Old School Road No alternative	■ No alternative available ■ Remove from evaluation ■ Will be the preferred site
Siting Area 22) OBR2-SHFT9: OBR at 12687 Mclaughlin Road	OBR2-SHFT9A – No alternative- Future connection	■ No alternative available ■ Removed from evaluation ■ Will be the preferred site
	Provisional Shaft A	■ No alternative ■ Removed from evaluation
Siting Area 23) OBR2-SHFT10: Old School Road at the OBR	OBR2-SHFT10A – Southeast corner of Old School Road and OBR	■ Carry forward
	OBR2-SHFT10B – Northeast corner of Old School Road and OBR	■ Carry forward
	OBR2-SHFT10C – Northwest corner of Old School Road and OBR	■ Carry forward
	OBR2-SHFT10D – Southwest corner of Old School Road and OBR	■ Carry forward
Siting Area 24) OS1-SHFT1: Near 2748 Old School Road	OS1-SHFT1A – South side Old School Road between OBR and Hurontario Street	■ Carry forward
	OS1-SHFT1B – North side Old School Road between OBR and Hurontario Street	■ Carry forward

Siting Area	Description	Screening
Siting Area 25) OS1-SHFT2: Old School Road at Hurontario Street (Highway 10)	OS1-SHFT2A – South side of Old School Road, 235 metres east of Hurontario Street (ARGO Development). Future connection.	■ Carry forward
	OS1-SHFT2B – Northeast corner of Hurontario Street and Old School Road Future connection.	■ Carry forward
	OS1-SHFT2C – Northwest corner of Hurontario Street and Old School Road Future connection.	■ Screen out as requires open cut construction across Hurontario St (MTO) to facilitate connection to Hurontario east side Argo development ■ Removed from evaluation
	OS1-SHFT2D – Southwest corner of Hurontario Street and Old School Road Future connection.	■ Carry forward, however note that requires trenchless construction across Hurontario St (MTO) to facilitate connection to Hurontario east side Argo development

Moving forward, a short-list alternative conceptual shaft locations were evaluated to ensure the site supported the construction of the preferred route. Carrying forward with the MTBM preferred construction method, shaft alternatives for each location were then evaluated using the detailed criteria to identify the preferred sites. Recognizing that there will be flexibility in the detailed design phase to select TBM as the preferred construction method, potential alternative tunnel boring machine shaft locations have also been identified with corresponding MTBM shaft locations.

The short-listed shaft locations were then evaluated in detail against the established evaluation criteria which included: Natural Environment; Socio-Economic Environment; Cultural Environment; Technical Environment.

The detailed evaluation of shortlisted shaft compound alternatives is provided in Appendix L2.

The conceptual shaft site locations were categorized based on their study objective:

- Key Connection Point: critical connections to existing or future trunk sewers to address the problem/opportunity statement.
- Minor Connection Point: minor connection to existing or future local sewers
- Interim shaft location to limit drive lengths and enable constructability of the sewer.

A total of 25 long list conceptual shaft siting areas, including 2 provisional shaft areas, were considered, each with a set of alterative sites, except for areas with no viable alternative, for example sites located within the OBR corridor with general siting area being set by drive lengths.

A summary of the evaluation results, highlighting the key determining factors for the selection of the preferred site is provided below.

7.2 Segment 1 Shortlisted Shaft Alternatives and Preferred Shaft Alternative

Segment 1: Kennedy Road from Etobicoke Creek to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road

Segment 1 extends approximately 4.9 kilometres along Kennedy Road from Etobicoke Creek to Vodden Street. In addition, Segment 1 also includes a proposed sewer on Queen Street from Kennedy Road to Rutherford Road which measures approximately 900 metres. The overall Segment 1 corridor is highly urbanized and includes a mix of residential, institutional, commercial and industrial uses. The following shaft compound alternatives were considered within Segment 1.

Siting Area 1) K1-SHFT1; TBM-SHFT1

Siting Area 1 as shown in **Figure 7-1** is located directly north of First Gulf Boulevard on Kennedy Road and is located within the Turner Fenton Secondary School landscaped area, fronting on the east side of Kennedy Road. The only other alternative site in this area was the immediate northerly landscaped area which was screened out due to smaller workable area and significant disruption to school access. At this time, there is a potential for one lane closure on First Gulf Boulevard and Kennedy Road.

Alternative K1-SHFT1A (also TBM-SHFT1A) is considered the preferred site because:

- It is the closest open space area that facilitates connection to Etobicoke Creek Trunk Sewer.
- It provides good separation from Etobicoke Creek Trunk Sewer project resulting in improved safety.
- It avoids using green space to the north which minimizes access disruption to school.

Figure 7-1: Siting Area 1: K1-SHFT1 & TBM-SHFT1



Siting Area 2) K1-SHFT2

Siting Area 2, as shown in **Figure 7-2**, is centred on Rambler Drive at Kennedy Road and includes four shaft compound alternatives:

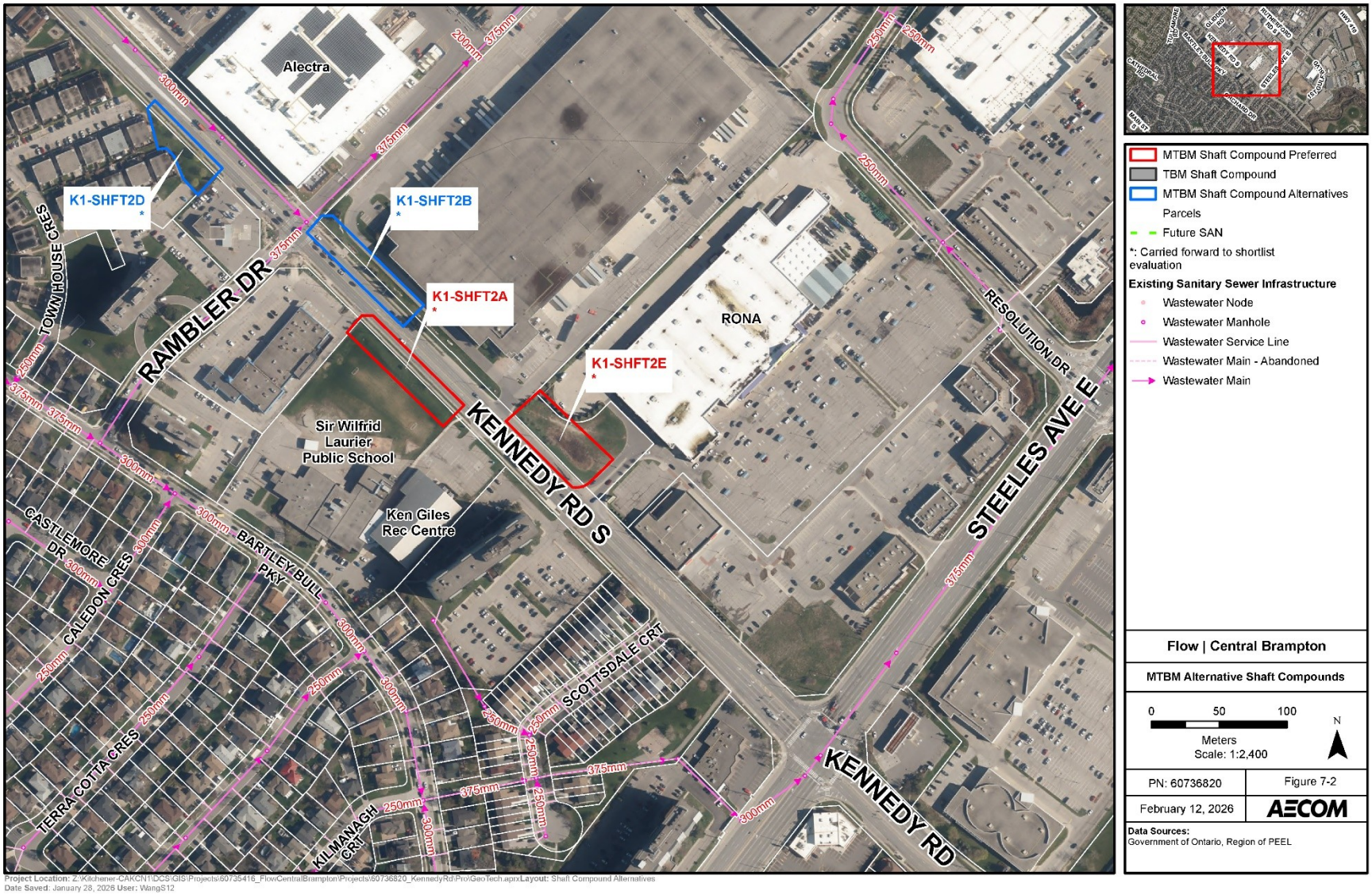
- K1-SHFT2A on the west side of Kennedy Road which occupies a portion of the Sir Wilfrid Laurier Public School soccer field.
- K1-SHFT2B on the east side of Kennedy Road and occupies a landscaped area associated with a large logistics warehouse that includes ASL Global Logistics, AMOR Shipping and Receiving and Autobahns Freight Lines Ltd.
- K1-SHFT2D on the west side of Kennedy Road and occupies greenspace associated with a townhouse complex.
- K1-SHFT2E on the east side of Kennedy Road on vacate lands next to RONA Building Supplies.

Shaft alternative K1-SHFT2A and K1-SHFT2E are both identified as being preferred sites because:

- From a drive length perspective, SHFT-2A and SHFT-2E are preferred locations as they provide a shorter drive to the reception shaft SHFT1A.
- The working area at SHFT-2A is more preferred than SHFT-2E in terms of site setup for tunnelling activities.

The ultimate preferred shaft location will be determined through discussions with both affected property owners through the remainder of the MCEA planning process and preliminary and detailed design. At this time, there is a potential for one lane closure on Kennedy Road for both K1-SHFT2A and 2E.

Figure 7-2: Siting Area 2: K1-SHFT2



Siting Area 3) K1-GliddenSHFTA (also TBM-SHAFT2A)

Once in service the new Kennedy Road sanitary Trunk Sewer will be connected to the existing Glidden trunk sewer. As such, shaft compound alternatives were limited to open space areas at the northeast and northwest intersection of Kennedy Road and Glidden Road.

As shown in **Figure 7-3**, K1-GliddenSHFTA is located on the northeast corner of Kennedy Road and Glidden Road and occupies open space area associated with Brenntag Canada Inc. K1-GliddenSHFT B is located on the west side of Kennedy Road directly across of SHFT A and utilizes open space from a townhouse development.

Alternative site K1-GliddenSHFTA would require one-lane closure in addition to sidewalk closure on Kennedy Road and Glidden Road and/or a permanent easement for positioning the shaft fully or partially within a property boundary.

K1-GliddenSHFTA (also a potential TBM-SHFT2A) is considered the preferred site because:

- It provides ample open space area to accommodate shaft compound.
- It facilitates easier connection to Glidden Road trunk sewer, as this will connect from the east side of Kennedy Road.

Figure 7-3: Siting Area 3: K1-GliddenSHFTA



Siting Area 4) K1-SHFT3

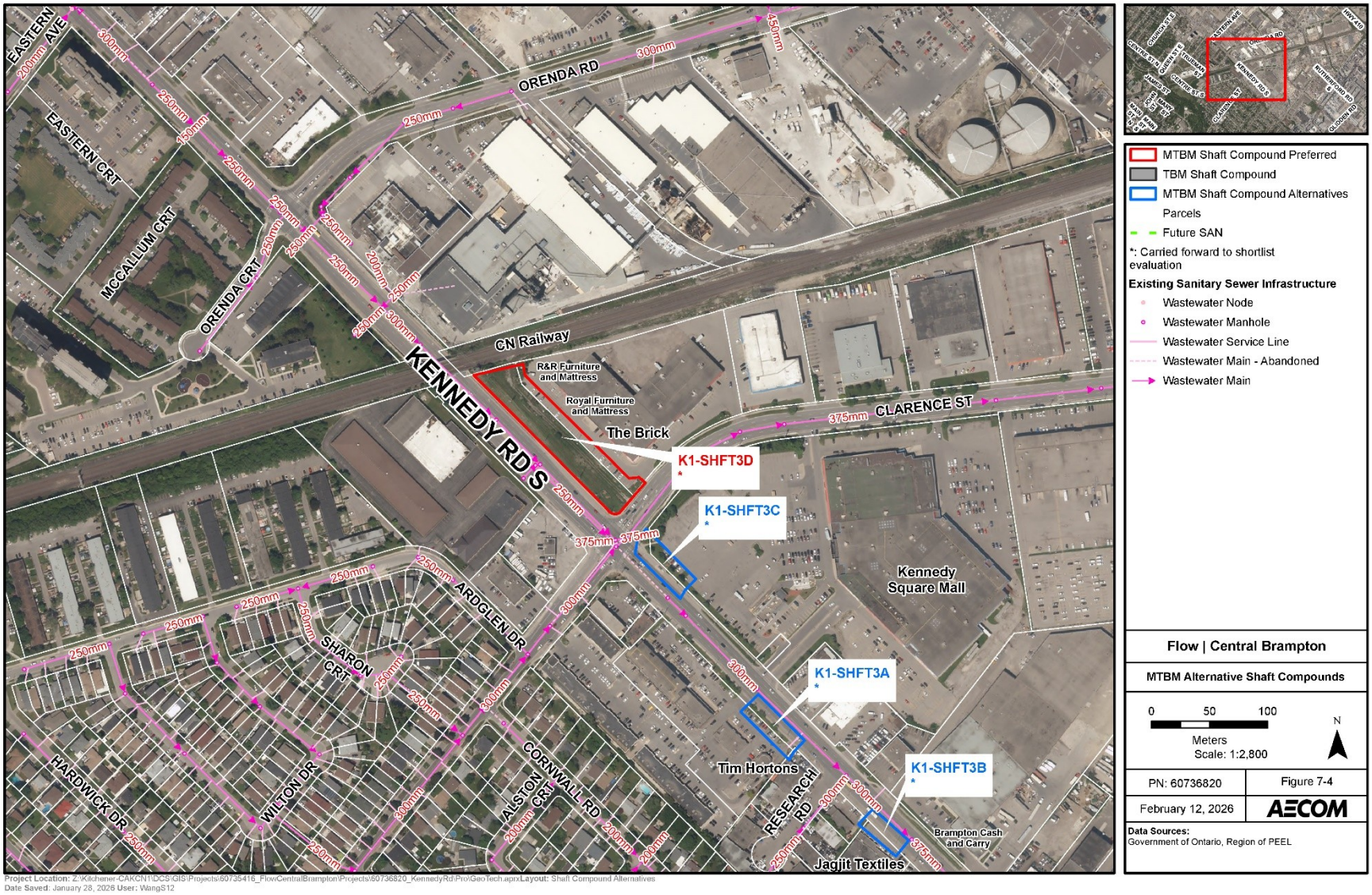
Siting Area 4, as shown in **Figure 7-4**, is located directly south of the CN Rail at Kennedy Road and extends southerly to just north of Dean Street at Kennedy Road. This area includes four shaft compound alternatives:

- K1-SHFT3A is located on the west side of Kennedy Road and occupies green space and parking area associated with a commercial plaza that also includes a Tim Hortons coffee shop.
- K1-SHFT3B is also located on the west side of Kennedy Road and occupies parking areas utilized by two small businesses.
- K1-SHFT3C is located at the southeast intersection of Kennedy Road and Clarence Street and occupies green space and parking areas associated with Kennedy Square Mall.
- K1-SHFT3D is located at the northeast intersection of Kennedy Road and Clarence Street and occupies green space and parking areas associated with several furniture retail outlets including The Brick furniture store.

Shaft alternative K1-SHFT3D is considered preferred because:

- It provides good size green space a significant portion of which is located within road's Right of Way to accommodate shaft compound.
- Allows for adequate drive length.
- It avoids lane and sidewalk closures.
- The MTBM can be launched from shortly before crossing the railway line, enabling fresh cutting tools and maintenance on the MTBM before crossing the railway line – good practice when crossing key infrastructure.

Figure 7-4: Siting Area 4: K1-SHFT3



Siting Area 5) K1-SHFT4

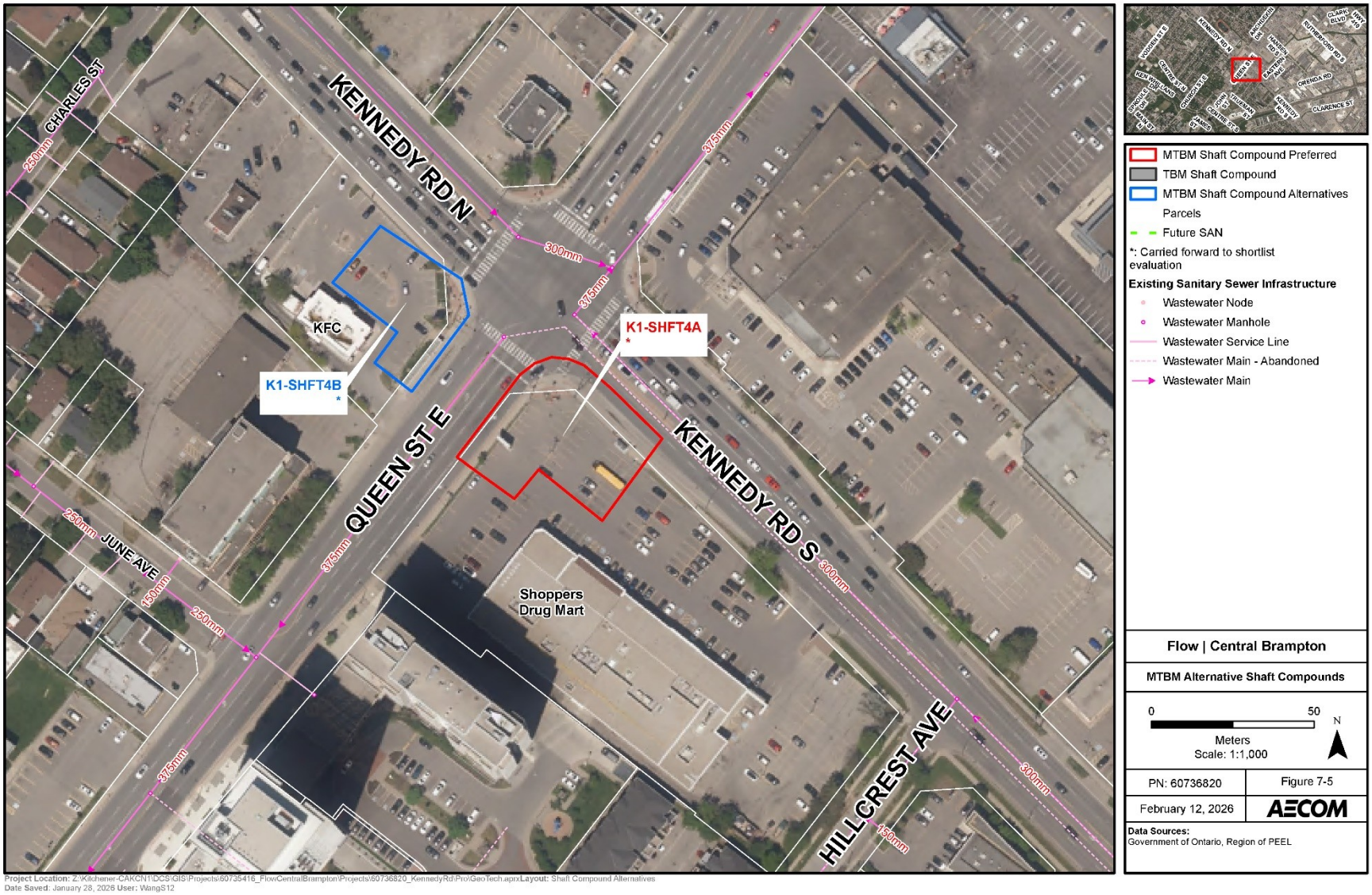
Siting Area 5 (**Figure 7-5**) is centred on the intersection of Kennedy Road and Queen Street with two shaft alternatives identified on the west side as follows:

- K1-SHFT4A is located at the southwest intersection of Kennedy Road and Queen Street and occupies parking areas associated with a commercial plaza that includes Shoppers Drug Mart. This alternative site would potentially result in a one-lane closure on Queen Street East and Kennedy Road South.
- K1-SHFT4B is located at the northwest intersection of Kennedy Road and Queen Street and occupied by parking and internal vehicular circulation areas associated with a KFC outlet.

Shaft alternative K1-SHFT4A is considered preferred because:

- Allows for adequate drive length.
- Provides sufficient working area for shaft compound.
- Maintains internal traffic flow and access to businesses.

Figure 7-5: Siting Area 5: K1-SHFT4



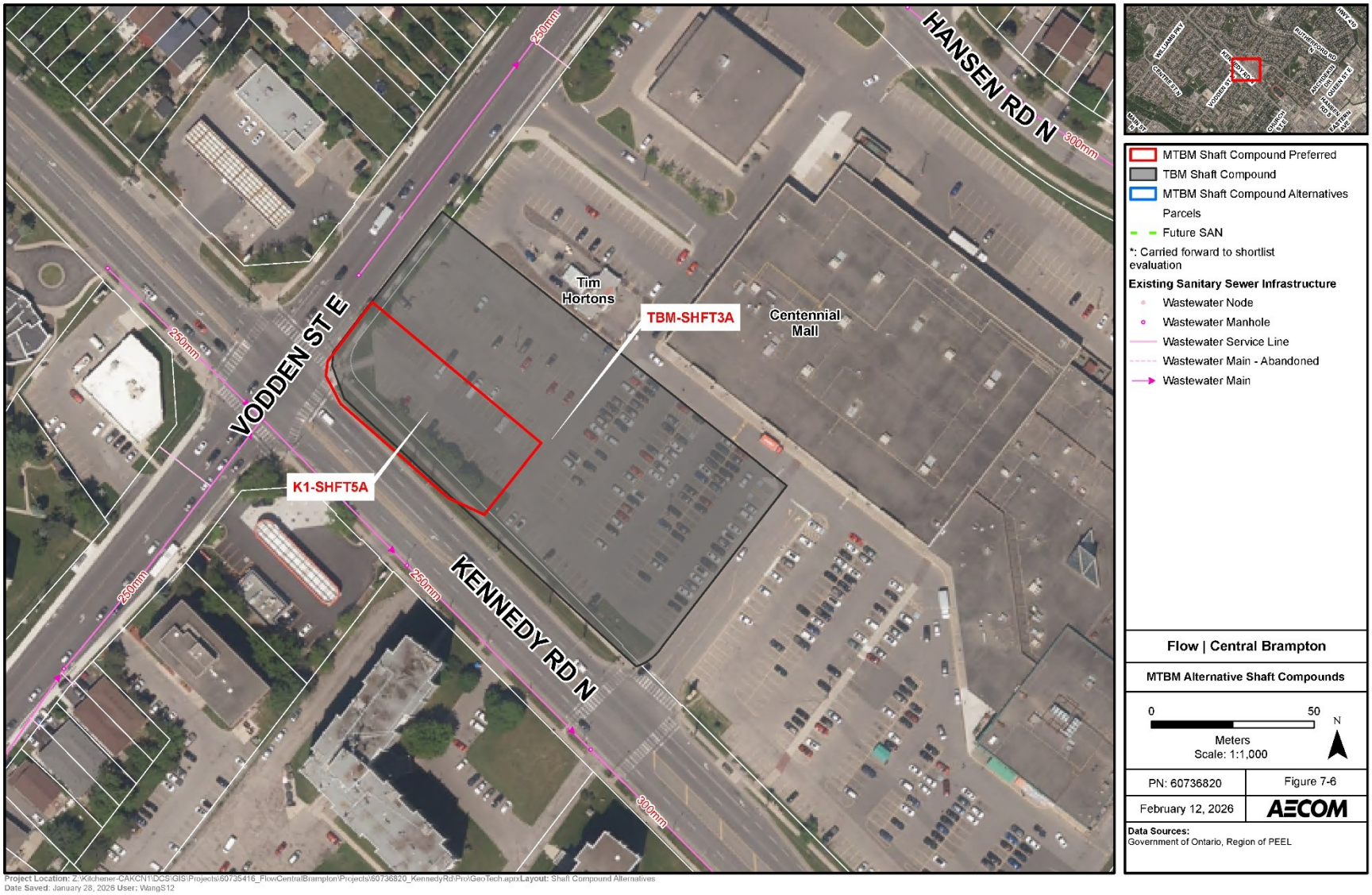
Siting Area 6) K1-SHFT5 (also TBM-SHAFT3)

Siting Area 6 is located at the southeast corner of Kennedy Road and Vodden Street which utilizes green space and parking areas associated with Centennial Mall. This area can potentially be used for both MTBM or TBM compound as illustrated below.

No other alternative sites were identified given that no other alternative sites were available and this location is a critical compound for the sanitary sewer alignment to proceed westerly on Vodden Street.

The MTBM shaft compound is denoted in red in Figure 7-6. A larger compound would be required for TBM activities if this option were used, and this larger compound is denoted in grey in Figure 7-6 below.

Figure 7-6: Siting Area 6: K1-SHFT5 & TBM-SHAFT3



Siting Area 7) Q1-SHFT1

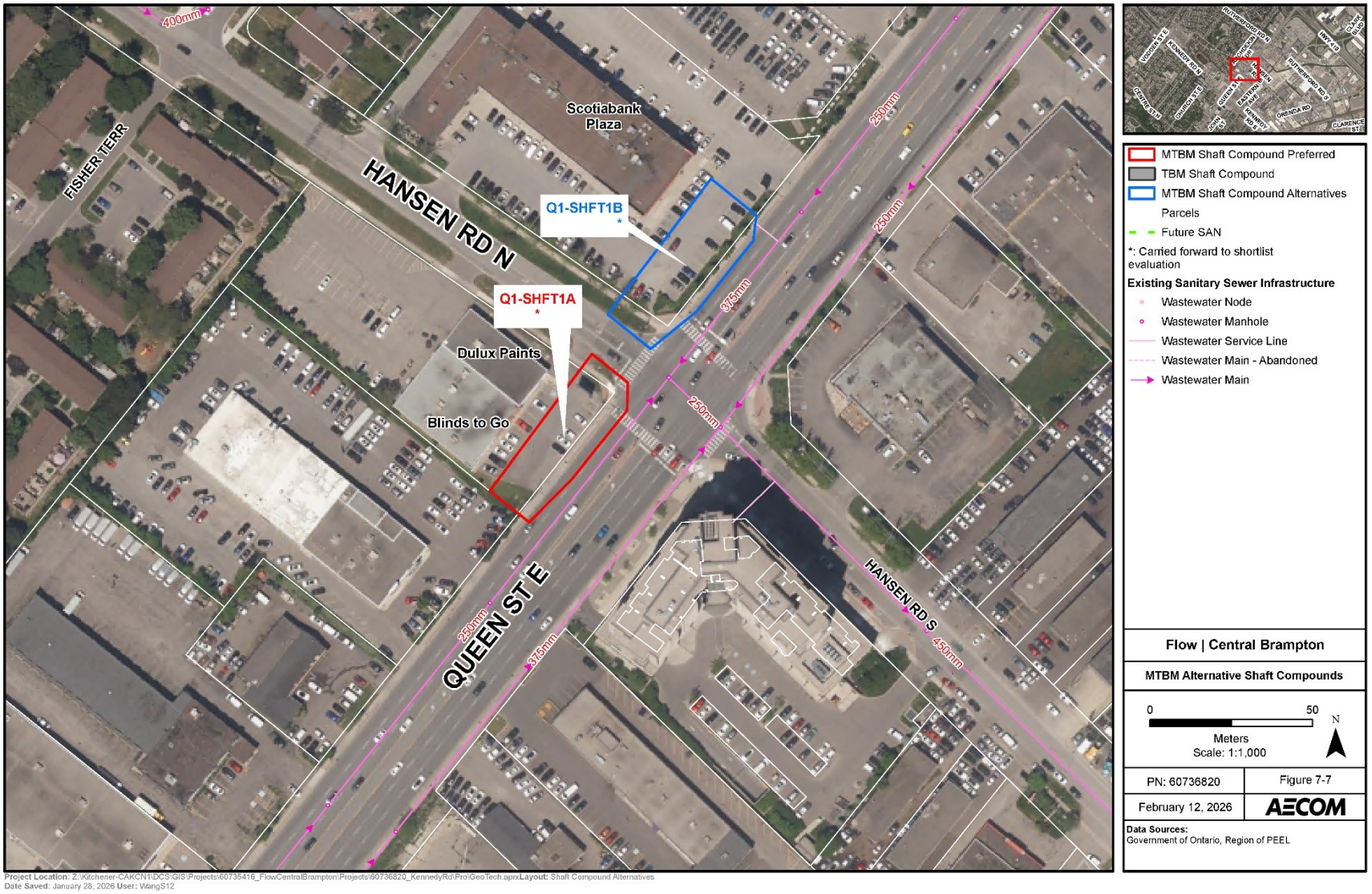
Siting Area 7, as shown in **Figure 7-7**, is located on the north side of Queen Street East at Hansen Road.

- Q1-SHFT1A is located at the northwest corner of Hanson Road and Queen Street East and is occupied by parking spaces associated with two commercial businesses.
- Q1-SHFT1B is located at the northeast corner of Hanson Road and Queen Street East and is occupied by green space and parking spaces associated with a commercial plaza that includes Scotia Bank.

Both alternatives would potentially result in a one-lane closure on Queen Street East. Shaft alternative Q1-SHFT1A is considered preferred because:

- There are fewer utility conflicts compared to the other alternative such as watermain.
- Less impacts to businesses.

Figure 7-7: Siting Area 7: Q1-SHFT1



Siting Area 8) Q1-SHFT2

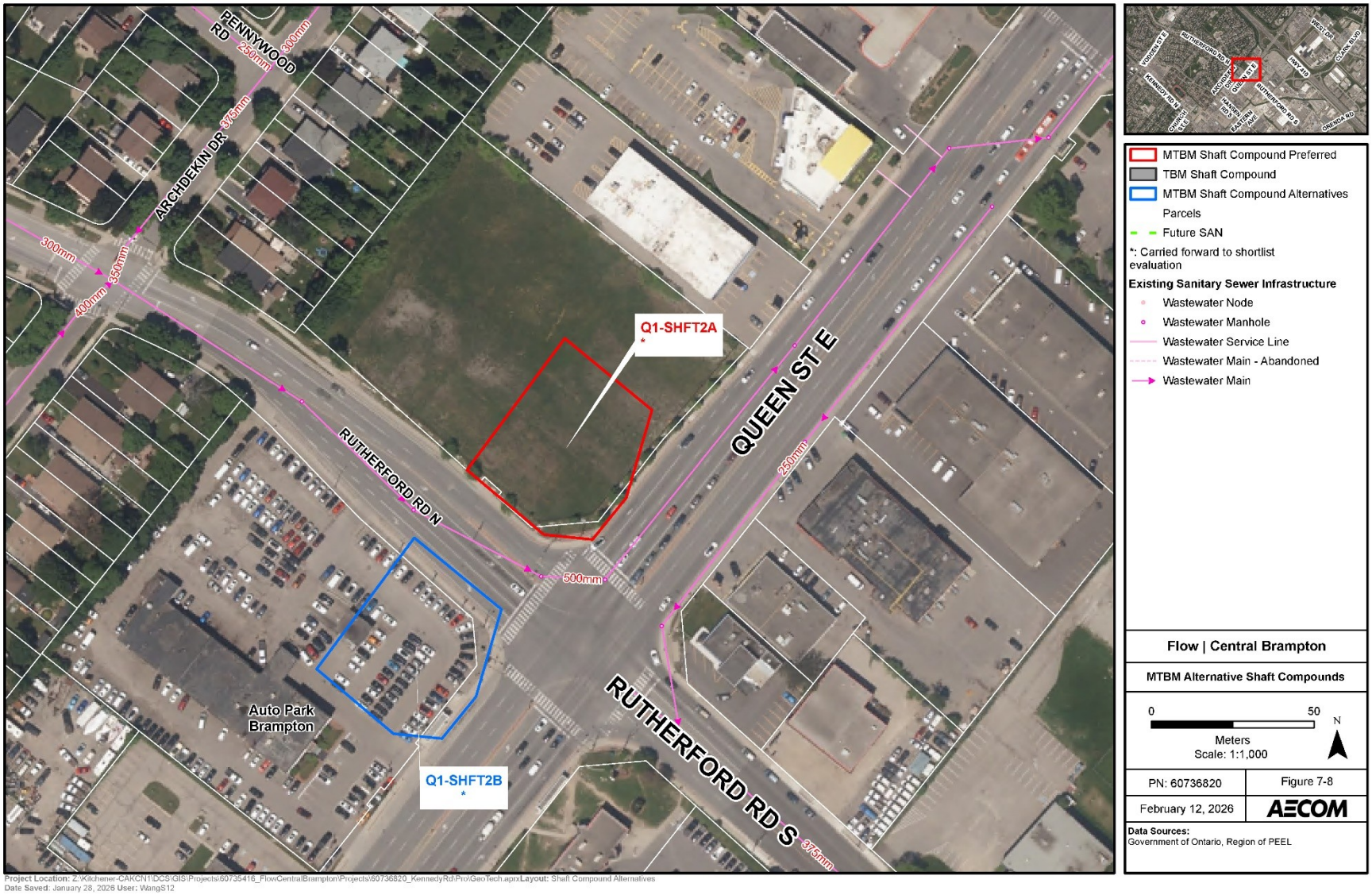
Siting Area 8, as shown in **Figure 7-8**, is located on the north side of Queen Street East at Rutherford Road.

- Q1-SHFT2A is located at the northeast corner of Rutherford Road and Queen Street East and is occupied by open space (entire property is vacant).
- Q1-SHFT2B is located at the northwest corner of Rutherford Road and Queen Street East and is occupied by parking spaces associated with a car dealership.

Shaft alternative Q1-SHFT2A is considered preferred because:

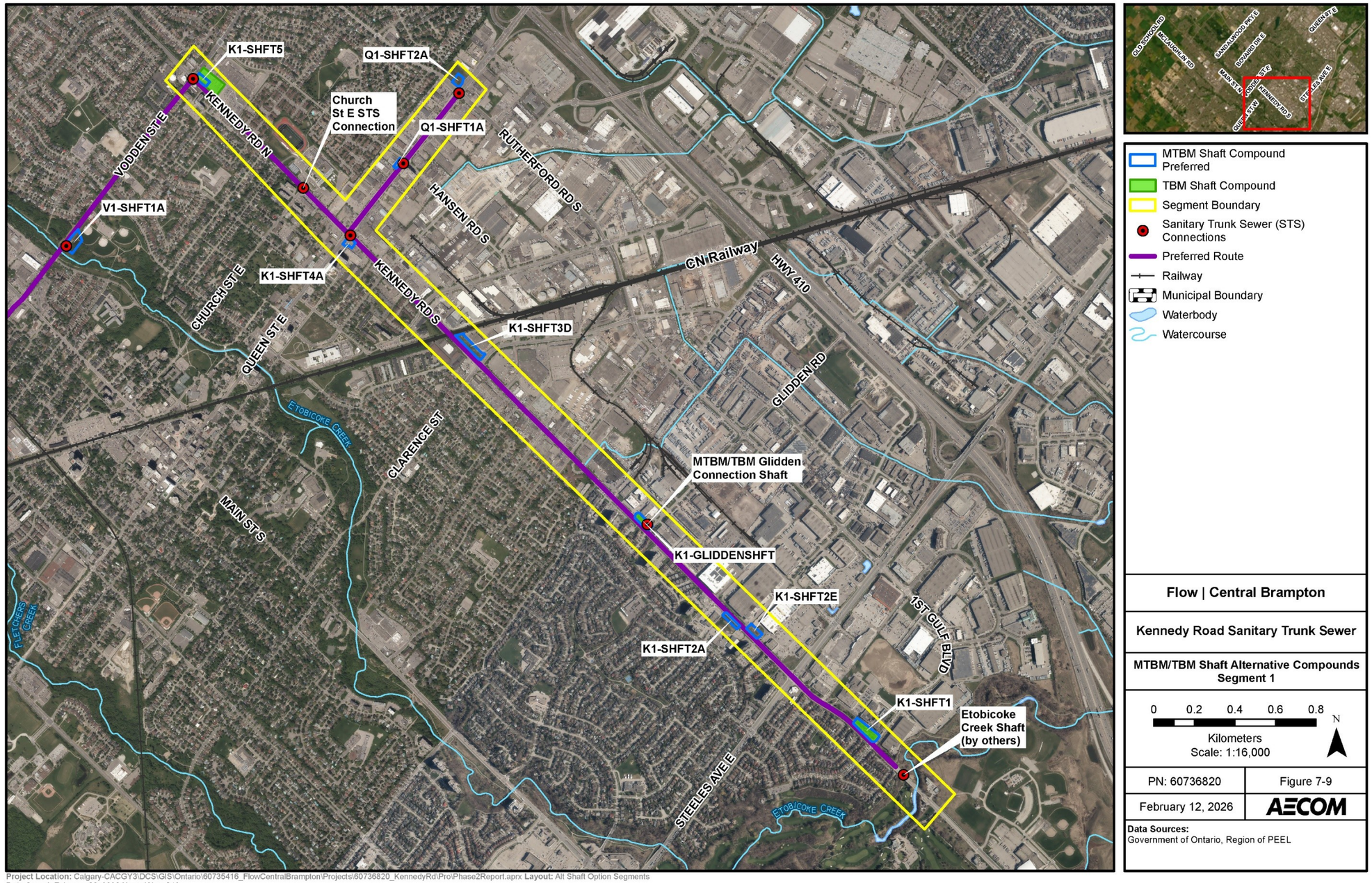
- It facilitates an easier connection to existing 500 millimetre Sanitary Sewer.
- Provides good open space working area with no tree removals or sensitive receptors.
- This location has fewer utility conflicts.

Figure 7-8: Siting Area 8: Q1-SHFT2



The Segment 1 overall routing alignment with preferred shaft compounds is shown below in **Figure 7-9**.

Figure 7-9: Segment 1: Kennedy Road from Etobicoke Creek to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road - Preferred Shaft Compound Locations



Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Projects\60736820_KennedyRd\Pro\Phase2Report.aprx **Layout:** Alt Shaft Option Segments
Date Saved: February 06, 2026 **User:** WangS12

7.3 Segment 2 Shortlisted Shaft Alternatives and Preferred Shaft Alternative

Segment 2 extends approximately 3.26 kilometres from the intersection of Kennedy Road and Vodden Street to the OBR Corridor at Vodden Street. From there the corridor extends northerly to Bovaird Drive, for a distance of approximately 0.9 kilometres, which also includes a section on Bovaird Drive from the OBR to Fletcher's Creek.

The corridor includes a mix of residential, institutional and commercial uses. The following shaft compound alternatives were considered within Segment 2.

Segment 2: Vodden Street to Bovaird Drive from Kennedy Road

Siting Area 9) V1-SHFT1

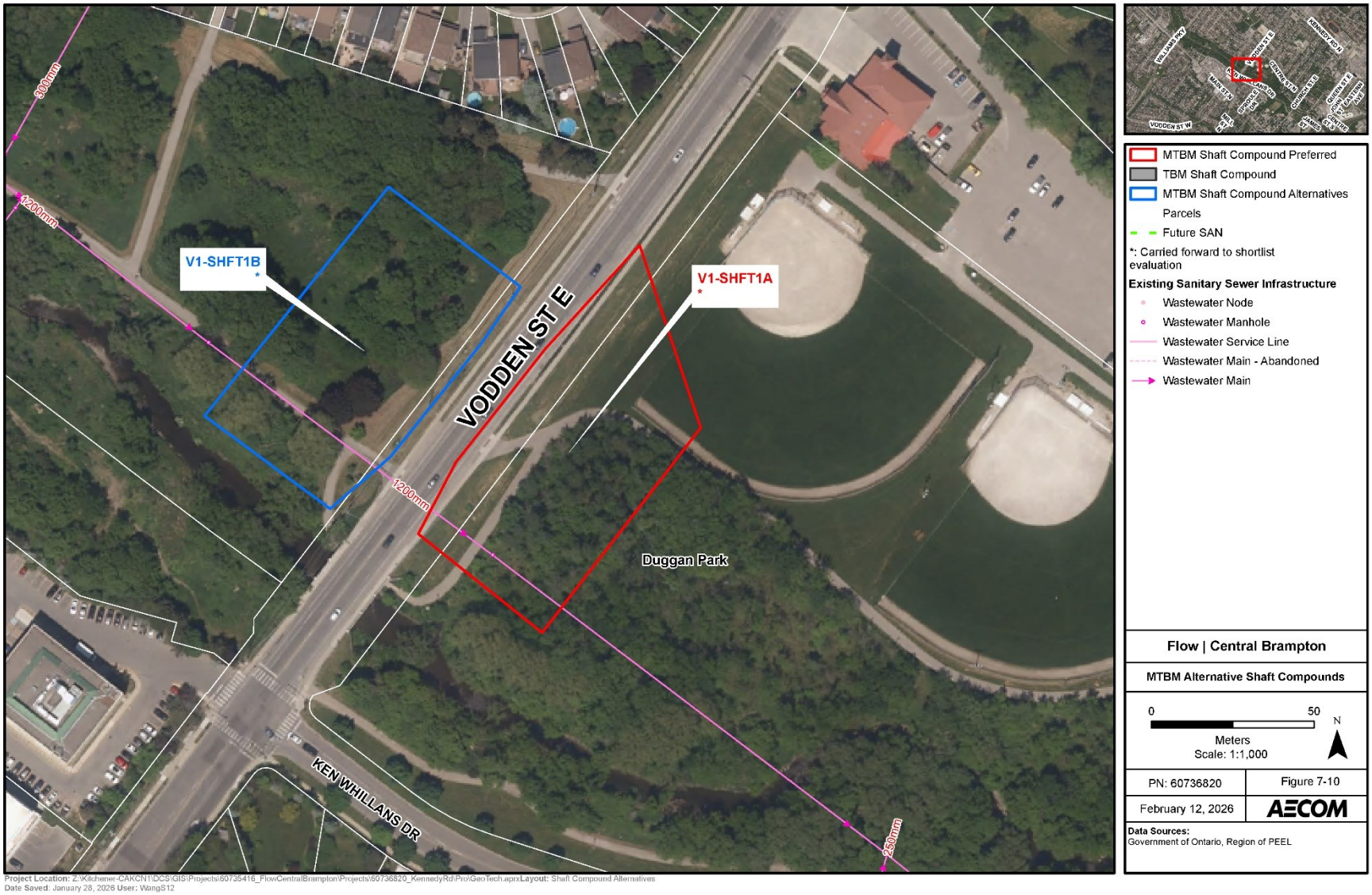
Siting Area 9, as shown in **Figure 7-10**, is located on Vodden Street on the east side of Etobicoke Creek and Ken Whillans Drive.

- V1-SHFT1A is located at the south side of Vodden Street and is occupied by green areas including mature trees and a portion of Duggan Park baseball diamond, in addition to Etobicoke Creek trail.
- V1-SHFT1B is located at the north side of Vodden Street and is occupied by green areas including mature trees including the Etobicoke Creek trail.

Both alternatives provide working areas for a diversion chamber and would potentially result in a one-lane closure on Vodden Street. Shaft alternative V1-SHFT1A is considered preferred because:

- It allows tunnel alignment to remain on one side of the road and facilitates good connection to existing sanitary sewer with new diversion chamber.
- It avoids relocation of existing Alectra and telecommunications cables (which are on the north side of Vodden Street).
- Creates less disruption to single family residences located on north side of Vodden Street East.

Figure 7-10: Siting Area 9: V1-SHFT1



Siting Area 10) OBR1-SHFT1 (also TBM-SHFT4A)

Siting Area 10, as shown in **Figure 7-11**, is located on Vodden Street at OBR and includes the following shaft alternatives:

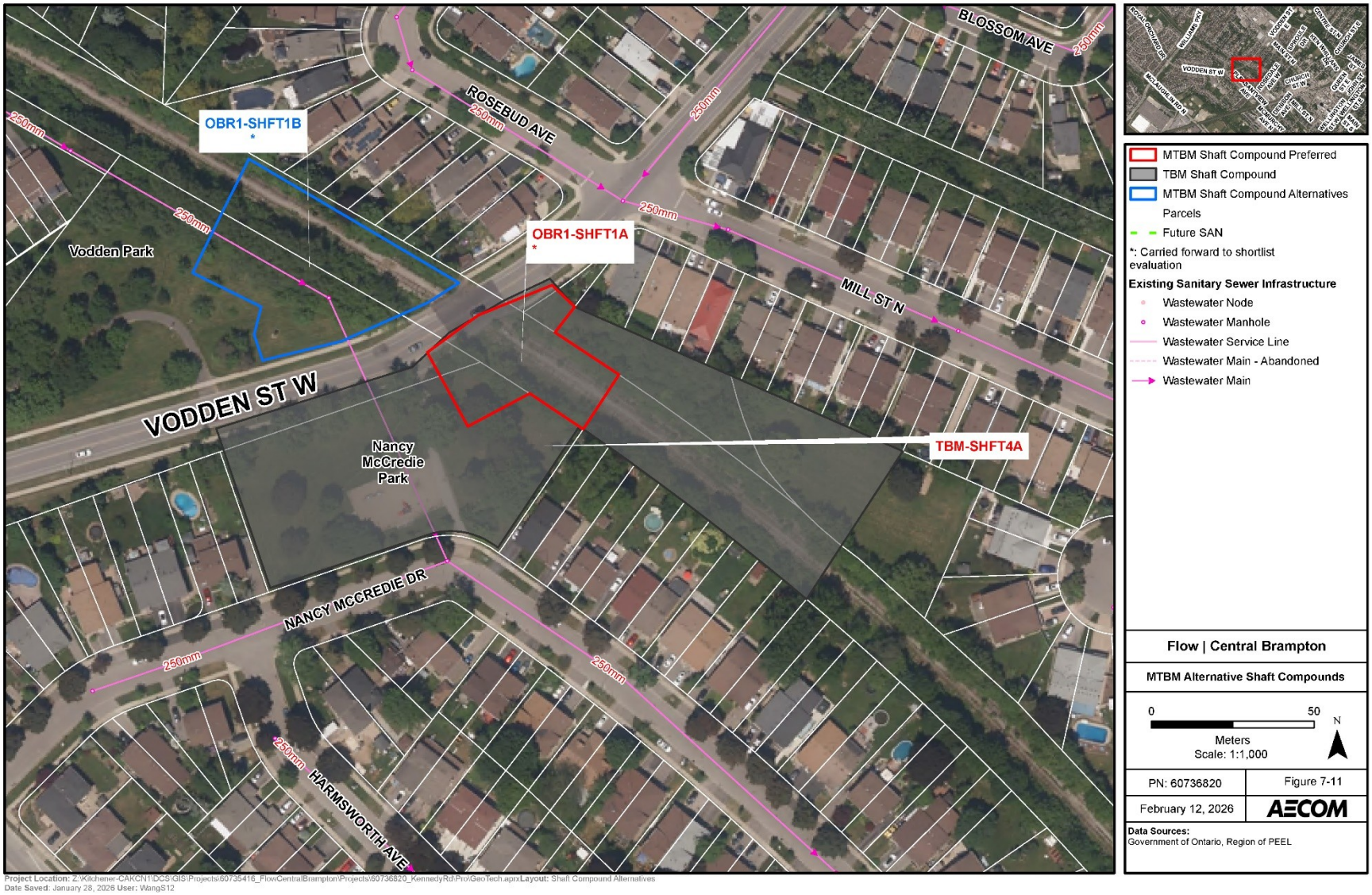
- OBR1-SHFT1A is located at the south side of Vodden Street at Orangeville Brampton Railway and is occupied by green areas including mature trees associated with a portion of Nancy McCreedie Park
- OBR1-SHFT1B is located at the north side of Vodden Street and is occupied by green areas associated with Vodden Park.

Shaft alternative OBR1-SHFT1A is considered preferred because:

- It allows tunnel alignment to remain on one side of the road.
- Provides some tunnel shaft separation from adjacent residences.
- The curvature required for the alignment to turn from Vodden Street into shaft compound OBR-SHFT1B would be too tight without passing beneath the residential properties on the northeast corner of this intersection.

A larger compound (TBM-SHFT4A) would be required for TBM activities if this option were used, and this larger compound is denoted in grey in **Figure 7-6** below.

Figure 7-11: Siting Area 10: OBR1-SHFT1



Siting Area 11) OBR1-SHFT2

Siting Area 11, as shown in Figure 7-12, is located on Williams Parkway at OBR and includes the following shaft alternatives:

- OBR1-SHFT2A is located at the north side of Williams Parkway at OBR and is occupied by green areas including Armbro Park soccer field. This alternative is also currently being used as a construction compound for the Region's Williams Parkway Watermain Project.
- OBR1-SHFT2B is located at the south side of Williams Parkway at OBR and is occupied by green areas associated with Burton Park. This alternative is also currently being used as a construction compound for the City of Brampton Williams Parkway Road Improvement Project.

Both shaft alternatives OBR1-SHFT2A and B are considered preferred because:

- It has good accessibility and working area availability
- SHAFT2A creates less temporary disruption to single family residences compared to south side of Williams Parkway (SHFT2B).
- If the Williams Parkway contractor can complete the construction of the shaft at Armbro Park (OBR1-SHFT2A) before construction of the Kennedy Road STS, the Region of Peel could descope the landscaping work and transfer the working area to the Kennedy Road contractor. This would result in significant cost and schedule savings. Although this adds a constraint on the construction scheduling.

Considering the potential overlap and schedule implications with the current Peel Region watermain project, both alternatives OBR1-SHFT2A and B are carried forward as preferred.

Figure 7-12: Siting Area 11: OBR1-SHFT2



Siting Area 12) OBR1-SHFT3 and Provisional Shaft B

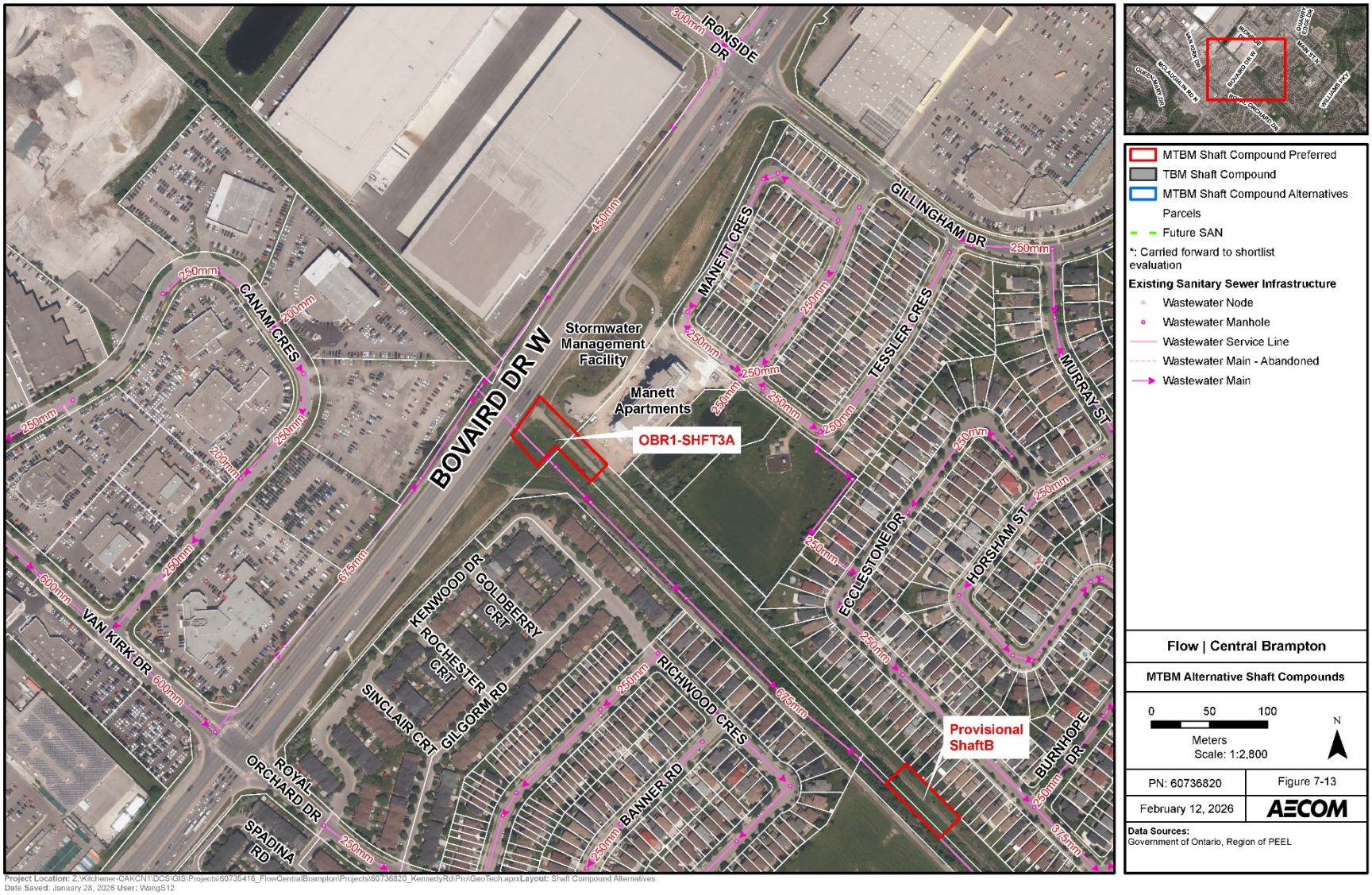
Siting Area 12, as shown in **Figure 7-13**, is located on south side of Bovaird Drive at OBR and includes the following shaft alternative:

- OBR1-SHFT3A is located on the south side of Bovaird Drive West and is occupied by open space area located within the Bovaird Drive right-of-way.

No other alternative sites were identified given that no other alternative sites were available due to conflicts with stormwater management facility on the east side of the OBR. In addition, this location is an optimal compound for the connection to the existing Fletcher's Creek Sanitary Trunk Sewer.

A provisional shaft B is located entirely within the OBR and is approximately 365 metres south of OBR1-SHFT3A (**Figure 7-13**). Provisional Shaft B will only be used if the selected contractor requires it for constructability purposes and can be accessed from the Williams Parkway or Bovaird Drive.

Figure 7-13: Siting Area 12: OBR1-SHFT3 and Provisional Shaft B



Siting Area 13) B3-SHFT1

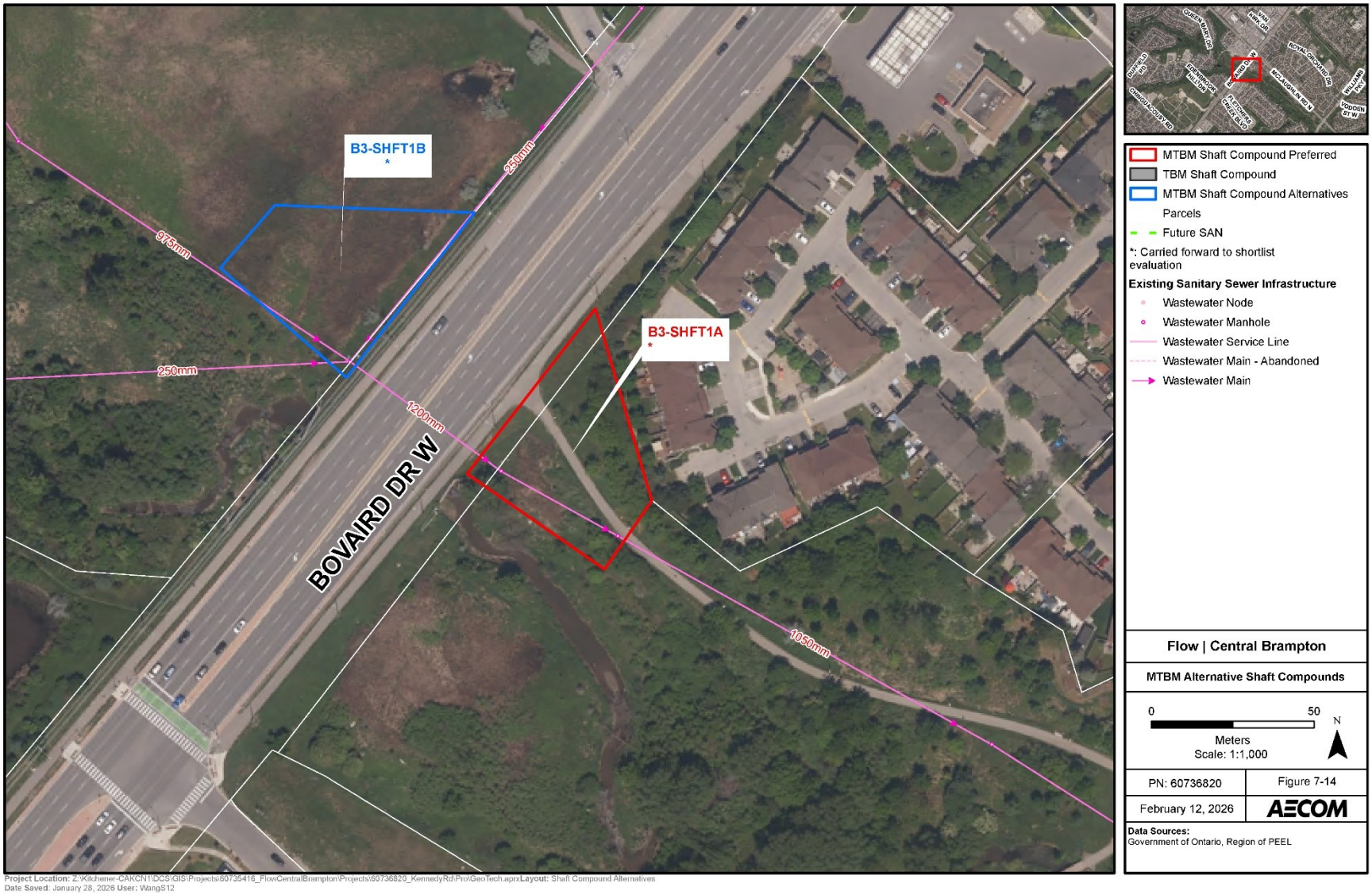
Siting Area 13, as shown in **Figure 7-14**, is located on Bovaird Drive immediately east of Fletcher's Creek and includes the following shaft alternative:

- B3-SHFT1A is located at the south side of Bovaird Drive and is occupied by green areas including mature trees in addition to Etobicoke Creek trail.
- B3-SHFT1B is located at the north side of Bovaird Drive and is occupied by green areas including mature trees.

Shaft alternative B3-SHFT1A is considered preferred because:

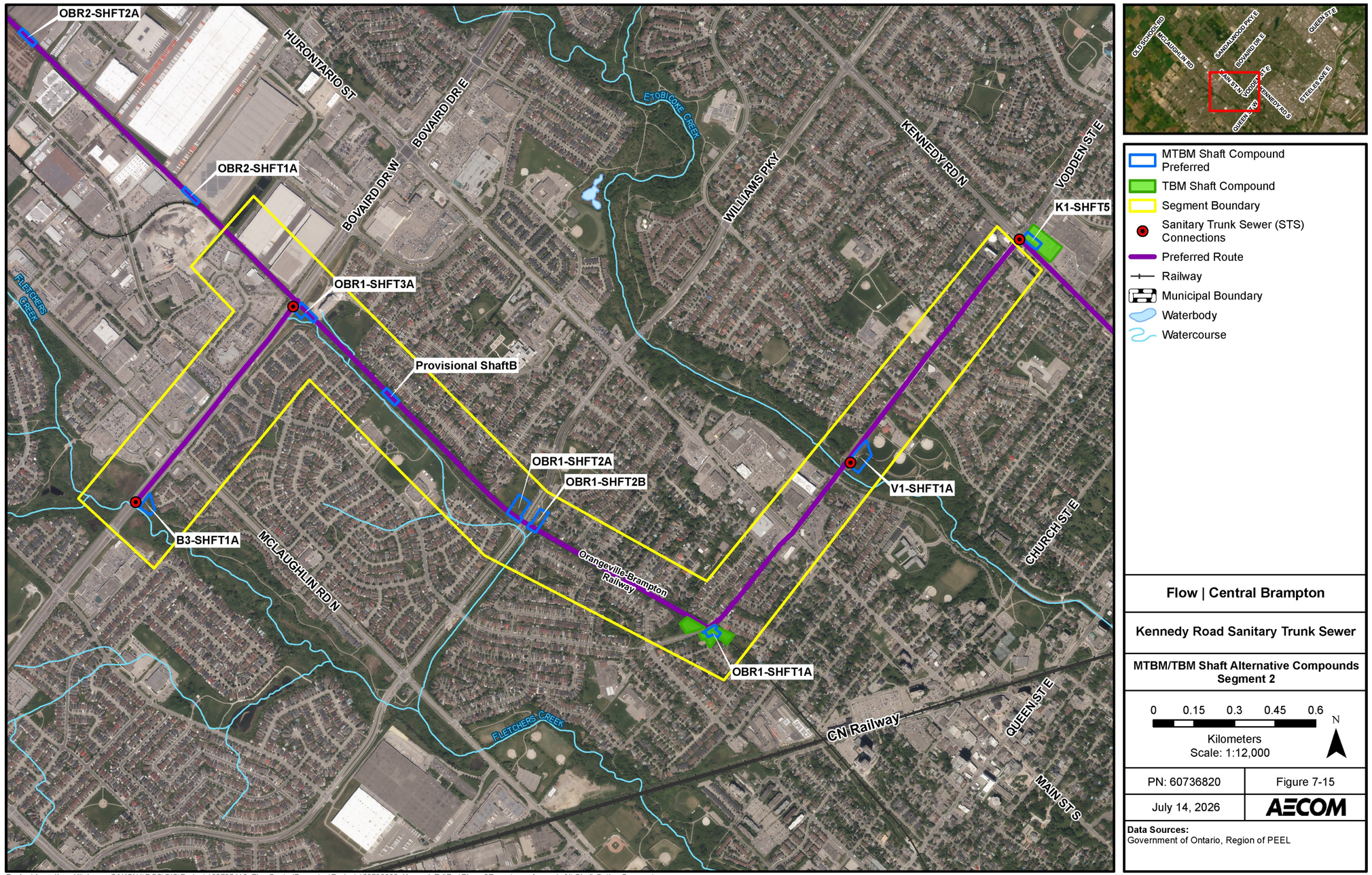
- It allows tunnel alignment to remain on one side of the road and facilitates good connection to existing sanitary sewer with new diversion chamber.
- It is an optimal location to capture flows from existing sewer.
- It avoids relocation of existing Alectra and telecommunications cables.

Figure 7-14: Siting Area 13: B3-SHFT1



The Segment 2 overall routing alignment with preferred shaft compounds is shown below in **Figure 7-15**.

Figure 7-15: Segment 2: Vodden Street to Bovaird Drive from Kennedy Road; OBR – Bovaird Drive to Fletcher's Creek Preferred Shaft Compound Locations



7.4 Segment 3 Shortlisted Shaft Alternatives and Preferred Shaft Alternative

Segment 3 extends approximately 7.5 kilometres from the intersection of Bovaird Drive northerly to Old School Road. From there the corridor extends easterly to Hurontario Street for a distance of approximately 1.2 kilometres. The corridor includes a mix of residential, industrial uses as well as agricultural uses which will eventually become urbanized. The following shaft compound alternatives were considered within Segment 3.

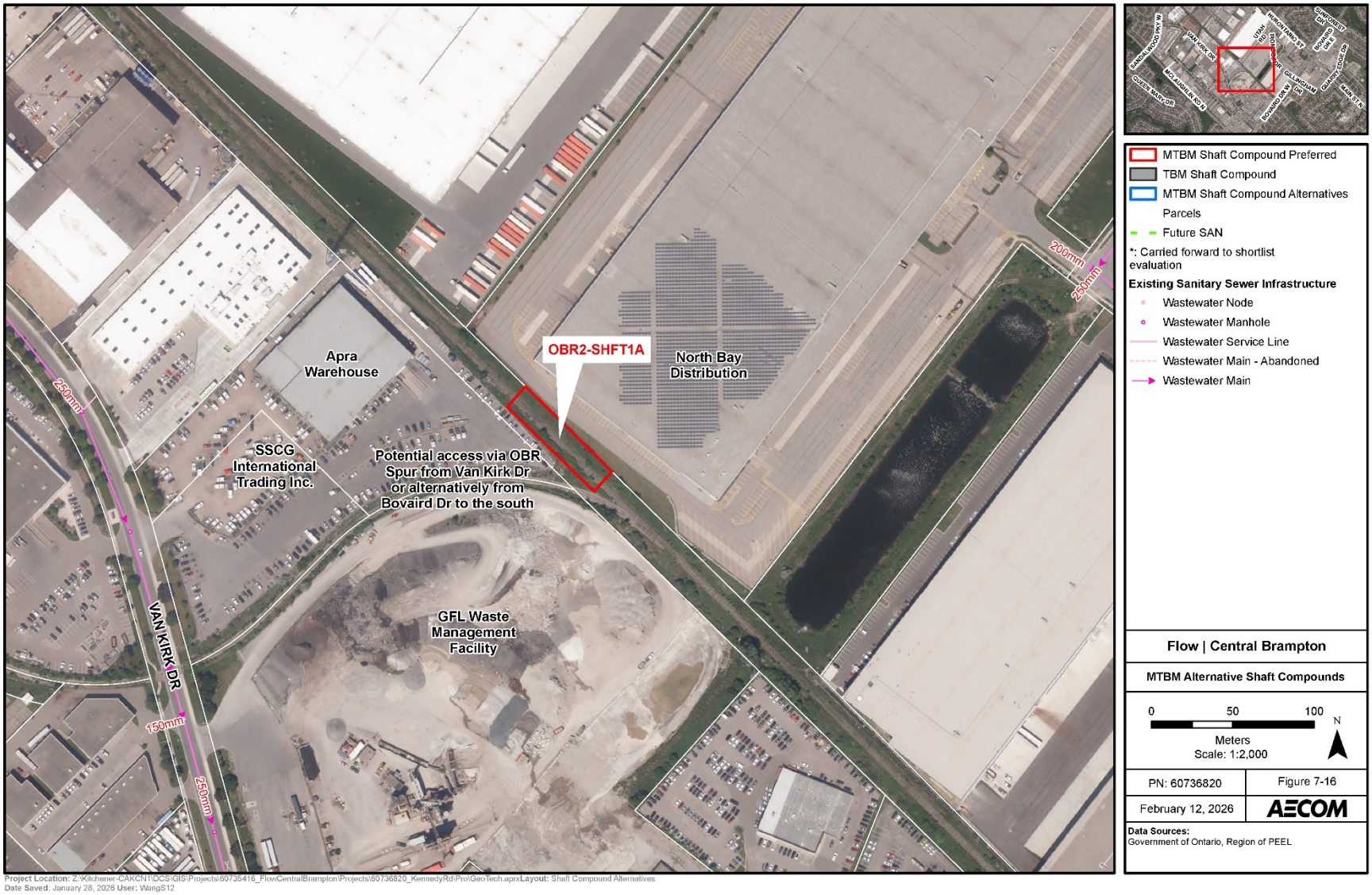
Segment 3: OBR corridor from Bovaird Drive to Old School Road and Old School Road to Hurontario Street

Siting Area 14) OBR2-SHFT1A

Siting Area 14, as shown in Figure 7-16, is located entirely within the OBR corridor just north of Bovaird Drive. Both east and west sides of the shaft compound include industrial uses. Access to the compound would be either from the OBR Van Kirk Drive rail spur or from Bovaird Drive to the south.

No other alternative sites were identified at this location given that this location facilitates good drive length and shifting the location slightly north or south would result in the same impacts to surrounding properties. Furthermore, moving the shaft north or south would limit the accessibility from the Van Kirk Drive rail spur.

Figure 7-16: Siting Area 14: OBR2-SHFT1A



Siting Area 15) OBR2-SHFT2A

Siting Area 15, as shown in **Figure 7-17**, is located entirely within the OBR corridor just south of Sandalwood Parkway. Both east and west sides of the shaft compound include industrial uses. Access to the compound would be either from Sandalwood Parkway or through Trans Canada Energy easement off of Van Kirk Drive to the west.

No other alternative sites were identified at this location given that this location facilitates good drive length and shifting the location slightly north or south would result in the same impacts to surrounding properties.

Figure 7-17: Siting Area 15: OBR2-SHFT2A



Siting Area 16) OBR2-SHFT3A

Siting Area 16, as shown in Figure 7-18, is located entirely within the OBR corridor just north of Sandalwood Parkway. The east side of the compound is occupied by the City of Brampton Transit Maintenance Facility and the west side of the compound is occupied by the single-family residential homes. Access to the compound would be from Sandalwood Parkway from the south or from Van Kirk Drive via TC Energy easement on Dymin Steel property.

No other alternative sites were identified at this location given that this location facilitates good drive length and shifting the location slightly north or south would result in the same impacts to surrounding properties.

Figure 7-18: Siting Area 16: OBR2-SHFT3A



Siting Area 17) OBR2-SHFT4

Siting Area 17, as shown in **Figure 7-19**, is located on Wanless Drive at OBR and includes the following shaft alternatives:

- OBR2-SHFT4A is located on the south side of Wanless Drive at OBR and includes a small portion of the Burnt Elm Park.
- OBR2-SHFT4B is located on the north side of Wanless Drive at OBR and includes a portion of City of Brampton's Stormwater Management Facility on the west side of the OBR.

Shaft alternative OBR1-SHFT2A is considered preferred because:

- It avoids conflict with hydro and telecommunications cables (north side of Wanless Drive).
- It avoids disruption to single family residences located on the north side of Wanless Drive.

Figure 7-19: Siting Area 17) OBR2-SHFT4

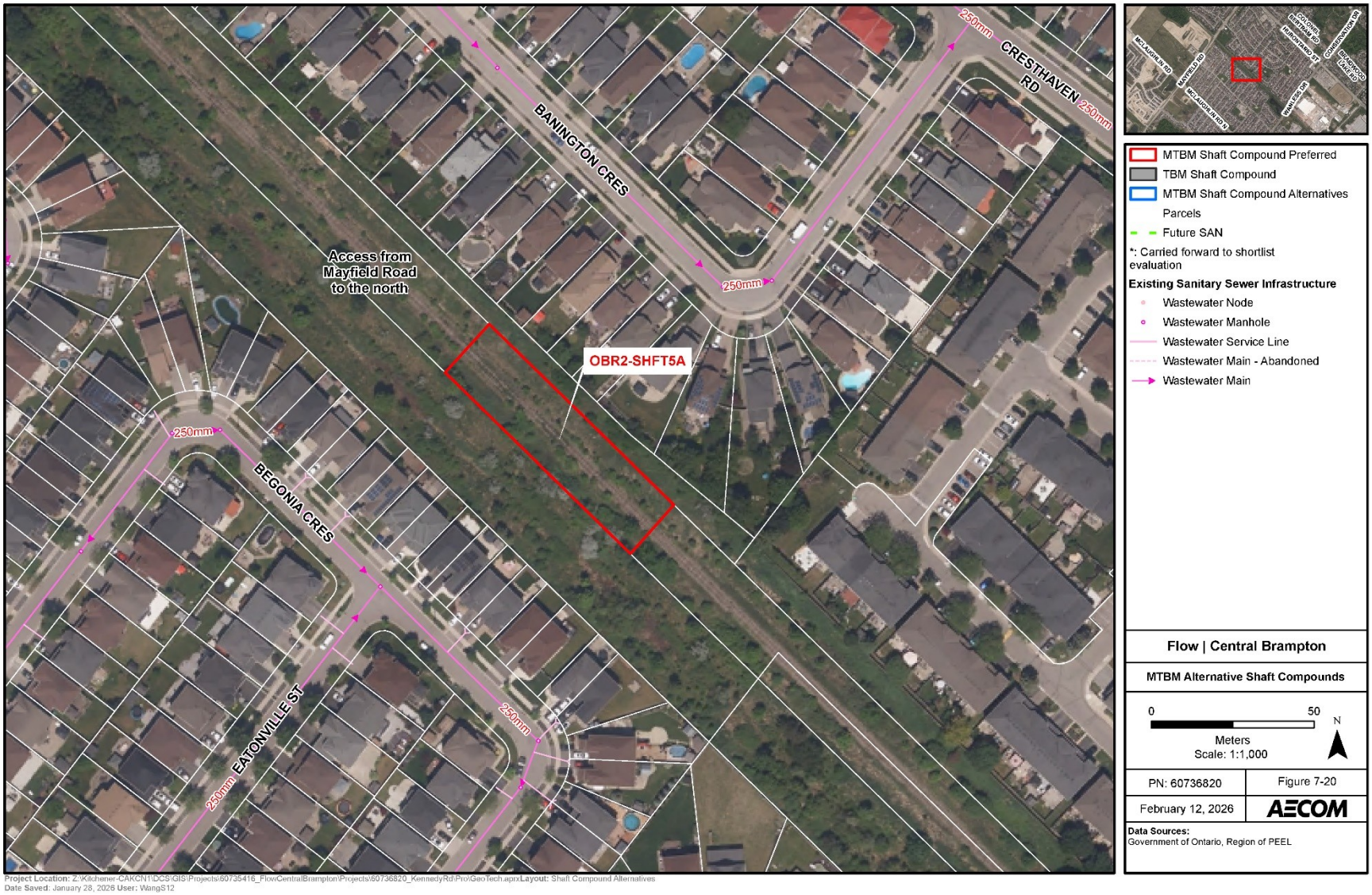


Siting Area 18) OBR2-SHFT5A

Siting Area 18, as shown in Figure 7-20, is located entirely within the OBR corridor just south of Mayfield Road. Both the east and west sides are occupied by single family residential homes. Access would be either from Mayfield Road to the north, or Wanless Drive to the south.

No other alternative sites were identified at this location given that this location facilitates good drive length and shifting the location slightly north or south would result in the same impacts to surrounding properties.

Figure 7-20: Siting Area 18: OBR2-SHFT5A



Siting Area 19) OBR2-SHFT6

Siting Area 19, as shown in **Figure 7-21**, is located on Mayfield Road at OBR and includes the following shaft alternatives:

- OBR2-SHFT6A is located on the south side of Mayfield Road within the OBR corridor and includes a small portion of the Chinguacousy Lions Club Water Tower Park. There are single family residential homes on the west side of the OBR corridor.
- OBR2-SHFT6B is located on the north side of Mayfield Road and entirely within the OBR corridor. There are single family residential homes on the east and west sides of the OBR corridor.

Shaft alternative OBR2-SHFT6A is considered preferred because:

- It provides good open space working area.
- Has less conflict with current Mayfield Road widening improvements

Figure 7-21: Siting Area 19: OBR2-SHFT6



Siting Area 20) OBR2-SHFT7

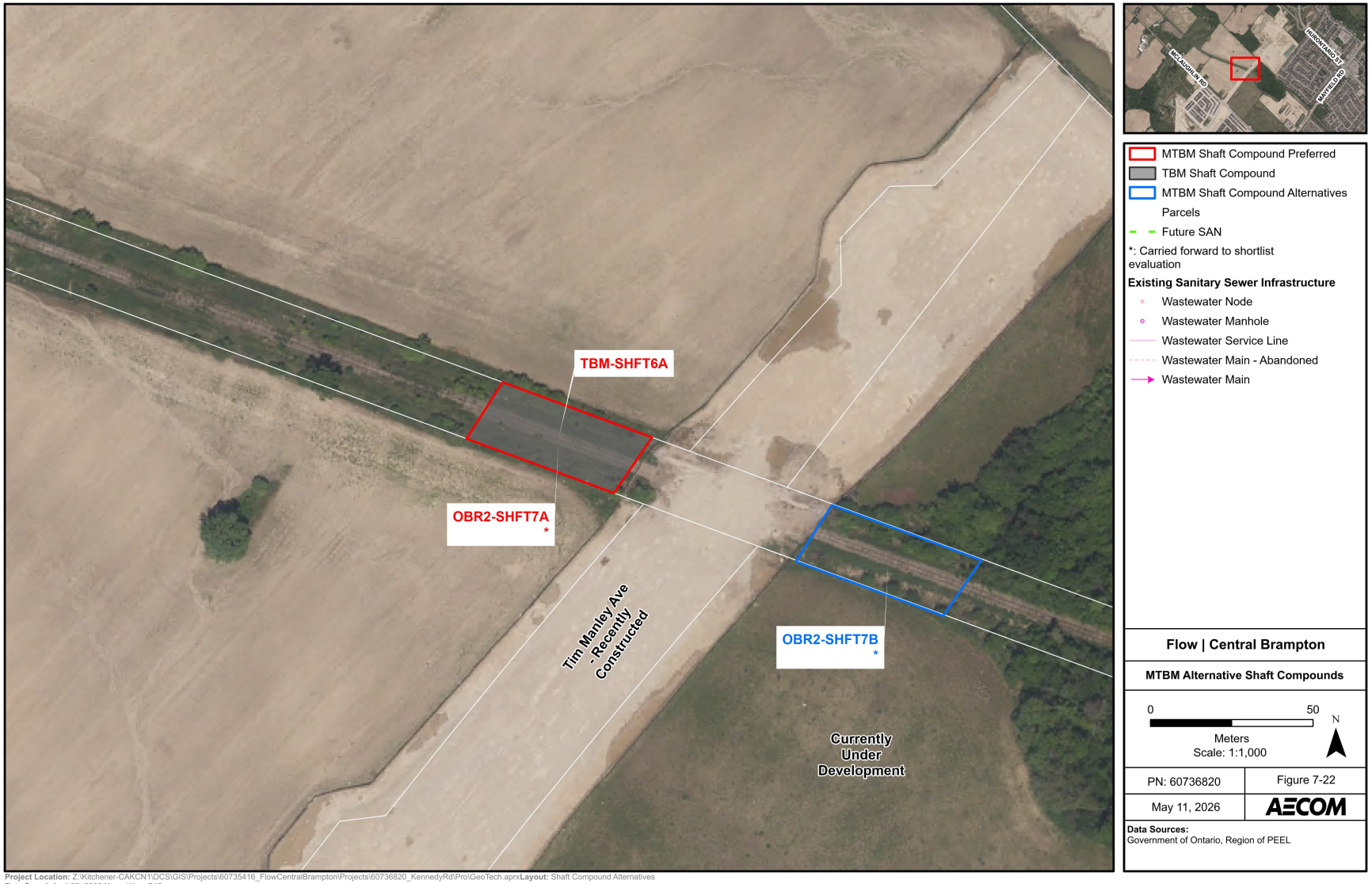
Siting Area 20, as shown in Figure 7-22, is located entirely within the OBR corridor at Tim Manley Avenue and includes the following shaft alternatives:

- OBR2-SHFT7A is located on the north side of Tim Manley Avenue at OBR.
- OBR2-SHFT7B is located on the south side of Tim Manley Avenue at OBR within a wooded area.

Shaft alternative OBR2-SHFT7A is considered preferred because:

- Provides for sufficient drive length.
- Avoids loss of trees and Species at Risk habitat compared to south side of Tim Manley Avenue.
- Avoids disruption to soon to be constructed single family residences on south side of Tim Manley Avenue, west side of OBR.

Figure 7-22: Siting Area 20: OBR2-SHFT7



Siting Area 21) OBR2-SHFT8A

Siting Area 21, as shown in Figure 7-23, is located entirely within the OBR corridor approximately 430 metres north of Tim Manely Avenue. Both the east and west sides are occupied agricultural lands. Access would be via temporary easement from McLaughlin Road to the west.

No other alternative sites were identified at this location given that this location facilitates good drive length and shifting the location slightly north or south would result in the same impacts to surrounding properties.

Furthermore, moving the shaft to the north or south would make access along the existing track from McLaughlin Road more complicated.

Figure 7-23: Siting Area 21) OBR2-SHFT8A



Siting Area 22) OBR2-SHFT9A

Siting Area 22, as shown in **Figure 7-24**, is located entirely within the OBR corridor approximately 530 metres south of Old School Road. Both the east and west sides are occupied agricultural lands. Access to the shaft compound on OBR would be via temporary easement from McLaughlin Road to the west. This location also facilitates connection to the adjacent development lands local future sanitary sewer systems.

No other alternative sites were identified at this location given that this location facilitates good drive length and shifting the location slightly north or south would result in the same impacts to surrounding properties. Moving the shaft to the south would take the location further from the access track from McLaughlin Road.

A provisional Shaft A is located entirely within the OBR and is approximately 400 metres north of OBR2-SHFT9A (**Figure 7-25**). Provisional Shaft A will only be used if the selected contractor requires it for constructability purposes.

Figure 7-24: Siting Area 22) OBR2-SHFT9A



Figure 7-25: Provisional Shaft A



Siting Area 23) OBR2-SHFT10 (also TMB-SHFT7A)

Siting Area 23, as shown in **Figure 7-26**, at the intersection of Old School Road and OBR corridor. This area includes four shaft compound alternatives:

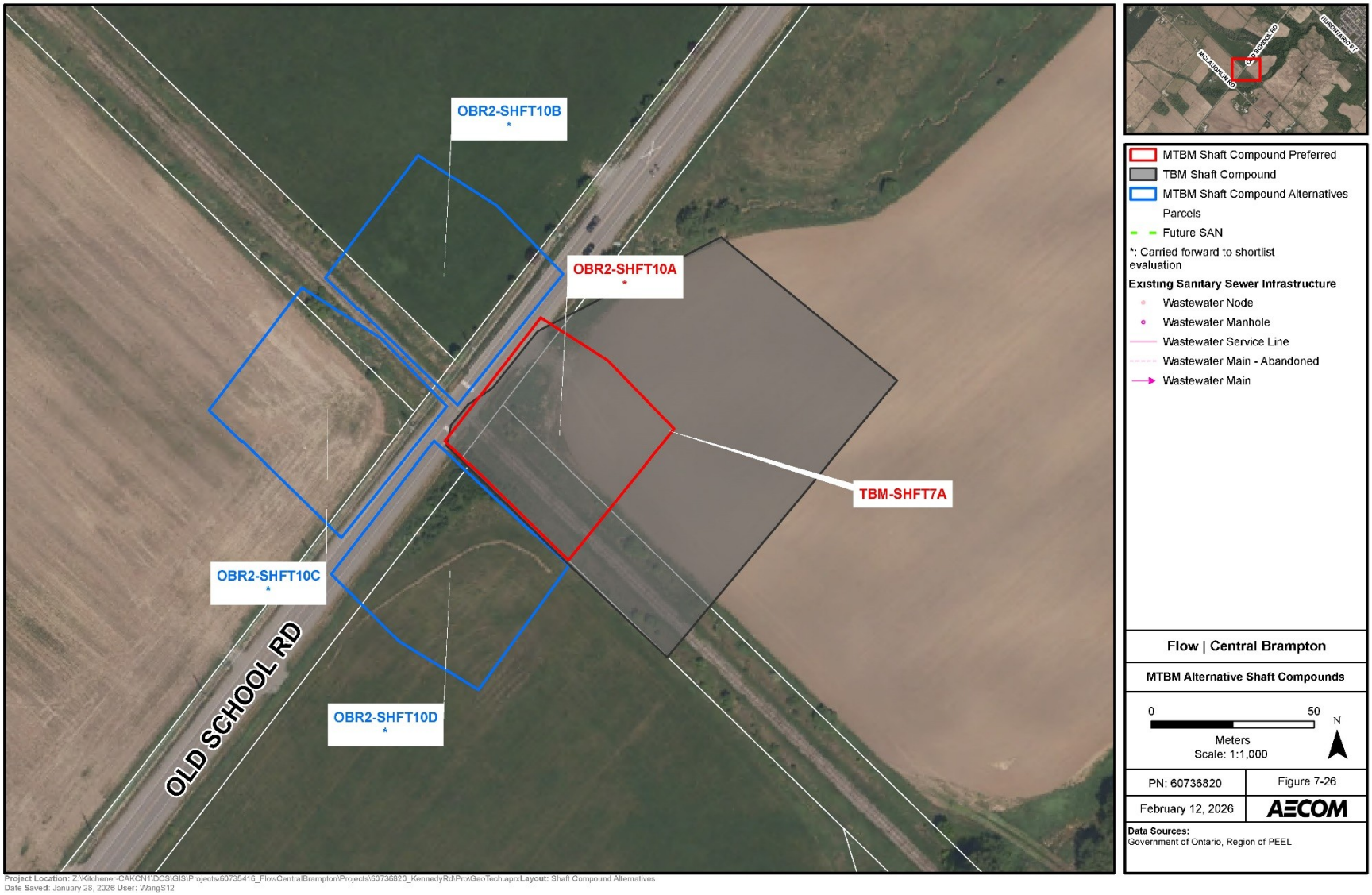
- OBR2-SHFT10A is located on the southeast corner of the intersection.
- OBR2-SHFT10B is located on the northeast corner of the intersection.
- OBR2-SHFT10C is located on the northwest corner of the intersection.
- OBR2-SHFT10D on the southwest corner of the intersection.
- All sites are located with active agricultural lands. All alternatives would potentially result in a one-lane closure on Old School Road.

Shaft alternative OBR2-SHFT10A is considered preferred because:

- It supports optimal drive length and tunnel alignment geometry.
- It avoids relocation of hydro and telecommunication cables on the north side of Old School Road.
- Site is subject to current development application and provides opportunity for land dedication.

A larger compound (TBM-SHFT7A) would be required for TBM activities if this option were used, and this larger compound is denoted in grey in **Figure 7-6** below.

Figure 7-26: Siting Area 23: OBR2-SHFT10/TBM-SHFT7A



Siting Area 24) OS1-SHFT1

Siting Area 24, as shown in **Figure 7-27,** is located on Old School Road between the OBR corridor and Hurontario Street and includes the following shaft alternatives:

- OS1-SHFT1A is located on the south side of Old School Road within active agricultural lands and include one-lane closure.
- OS1-SHFT1B is located on the north side of Old School Road within active agricultural lands.

Both alternatives would potentially result in a one-lane closure on Old School Road. Shaft alternative OS1-SHFT2A is considered preferred because:

- It maintains alignment on the south side of the road.
- It avoids relocation of hydro and telecommunication cables on the north side of Old School Road.
- The site is subject to current development application – opportunity for land dedication.

Figure 7-27: Siting Area 24: OS1-SHFT1



Siting Area 25) OS1-SHFT2

Siting Area 25, as shown in Figure 7-28, at the intersection of Old School Road and Hurontario Street. This area includes three shaft compound alternatives:

- OS1-SHFT2A was originally located on the southeast corner of the intersection. However, following discussions with the landowner, it was agreed that OS1-SHFT2A will be shifted further east on Old School Road but still within their property.
- OS1-SHFT2B is located on the northeast corner of the intersection.
- OS1-SHFT2D on the southwest corner of the intersection.

Both Shaft alternatives OS1-SHFT2A and D are considered preferred because:

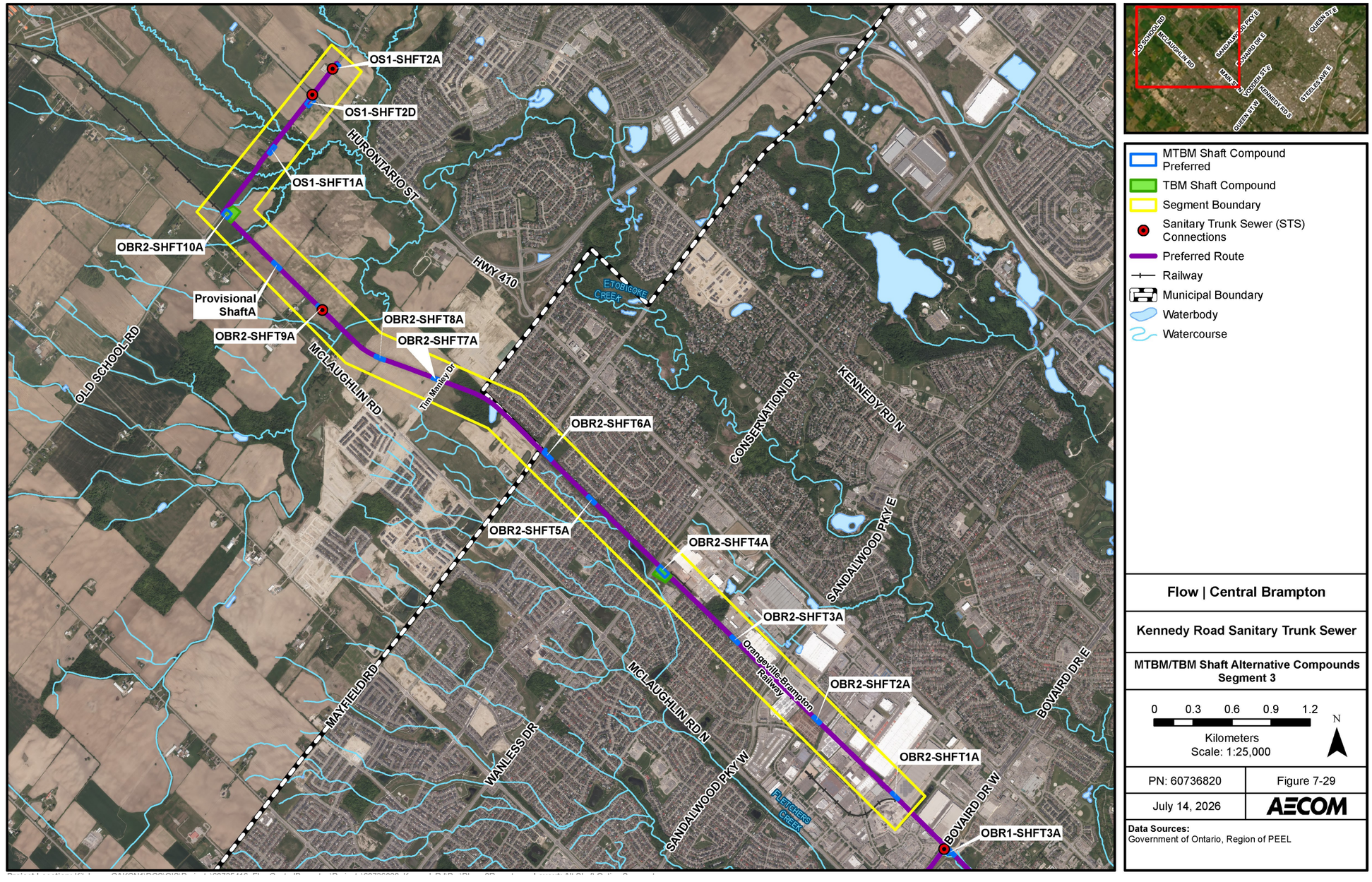
- Maintains alignment on the south side of the road.
- Given the existing large Alectra cables on the north side and the potentially lengthy relocation process (up to 24 months), locating the shafts on the south side of Old School Road is preferred.
- According to the property owner, site OS1-SHAFT2A is cleared of archaeological potential and already graded for development.
- Alternative Shaft site OS1-SHFT2D is still early in the development planning process compared to OS1-SHAFT2A which may facilitate easier approval for easements.

Figure 7-28: Siting Area 25: OS1-SHFT2



The Segment 3 overall routing alignment with preferred shaft compounds is shown below in **Figure 7-29**.

Figure 7-29: Segment 3: OBR corridor to Old School Road and Old School Road from OBR to Hurontario Street Preferred Shaft Compound Locations



8. Description of the Preferred Design Concept

8.1 Segment 1: Kennedy Road from First Gulf Boulevard to Vodden Street; including Queen Street from Kennedy Road to Rutherford Road

The preferred design concept for Segment 1 of the Kennedy Road STS, extending northerly from Etobicoke Creek to Vodden Street and including the Queen Street connection to Kennedy Road, is a trenchless tunnel constructed using either MTBM or TBM technology. Both methods are considered suitable based on the trunk sewer internal diameter (1,800 to 2,100 millimetres), geotechnical conditions, and the availability of adequate working compounds along the corridor.

Both MTBM and TBM have been identified as appropriate trenchless options due to:

- Large tunnel diameters required for the Kennedy Road STS (1,800 to 2,100 millimetre ID).
- Minimized surface disruption along a heavily urbanized corridor with significant utilities and constrained right-of-way.
- Availability of sufficiently working compounds at key locations (e.g., the commercial plaza at Kennedy Road/Vodden Street, industrial lands along First Gulf Boulevard, and designated work zones at Queen Street).
- The ability to maintain traffic operations, business access, and community function during construction.

Both methods require launch shafts and reception shafts located within the designated compounds. Future connections to the trunk sewer will also be made by constructing additional shafts, thereby eliminating the need for open-cut construction along the road.

Segment 1 of the proposed trunk sewer extends along Kennedy Road from Vodden Street to the south connection with the ECTS. The required pipe internal diameter is 1,800 millimetres from Vodden Street to Queen Street, then 2,100 millimetre from Queen Street to the ECTS.

Connection points for existing and future connections are required at:

- Glidden Road,
- Queen Street – Kennedy Road intersection,
- Queen Street – Hansen Road intersection,
- Queen Street – Rutherford Road intersection, and
- Church Street.

The Queen Street branch is included under Segment 1. This branch will be constructed using a MTBM. The Queen Street branch extends westerly down Queen Street from Rutherford Road to Kennedy Road. The pipe internal diameter is 1,200 millimetres. Connection points for existing and future connections are at:

- Rutherford Road, and
- Hansen Road.

8.2 Segment 2: Vodden Street from Kennedy Road to OBR and from OBR up to Bovaird Drive, and along Bovaird Drive to Fletcher's Creek

Segment 2 extends westerly from the intersection of Vodden Street and Kennedy Road, along Vodden Street to the intersection of the OBR to Vodden Street. Segment 2 then continues northerly along the OBR to the intersection with Bovaird Drive. The preferred design concept for Segment 2 of the Kennedy Road STS is trenchless construction using a MTBM.

This method is suitable for the trunk sewer internal diameter of 1,800 millimetres from Kennedy Road to the connection with the ECTS on Vodden Street, and then 1,500 millimetres from this connection to the intersection with Bovaird Road

This method requires launch shafts and reception shafts located within the designated compounds. Future connections to the trunk sewer will also be made by constructing additional shafts, thereby eliminating the need for open-cut construction along the road.

Connection points for existing and future connections are required at:

- The ECTS on Vodden Street close to Ken Whillans Road,
- The intersection of Bovaird Drive and the OBR, and
- Fletchers Creek Trunk Sewer on Bovaird Drive.

Two major diversion chambers are proposed as part of the Kennedy Road STS project. These structures are required to redirect existing sanitary flows from the Fletchers Creek STS and the ECTS into the new Kennedy Road STS trunk once it becomes operational. The diversion chambers form a critical hydraulic interface between the existing trunk system and the future deep trunk sewer along Kennedy Road.

- Etobicoke Creek STS Diversion Chamber (at Vodden Street):
  This chamber will connect the existing 1,200 millimetre Etobicoke Creek trunk system to the future Kennedy Road STS at the southern tie-in point. It will also include control gates and will be constructed adjacent to the existing trunk to minimize disruption.

- Fletchers Creek STS Diversion Chamber (at Bovaird Drive):
  This structure will diversion of flows from the existing 1,200 millimetre flows Fletchers Creek STS into the proposed Kennedy Road STS via a controlled (with gates) deep drop connection.

8.3 Segment 3: OBR from Bovaird Drive to Old School Road and Old School Road to east of Hurontario Street

Segment 3 extends northerly from the intersection of the OBR and Bovaird Drive, along the OBR to Old School Road and then easterly along Old School Road to Hurontario Street. The preferred design concept for Segment 3 of the proposed Kennedy Road STS is trenchless construction using a MTBM.

This method is suitable for the trunk sewer internal diameter of 1,500 millimetres for Segment 3. This method requires launch shafts and reception shafts located within the designated compounds. Connection points for existing and future connections are required:

- Along the OBR at the position of shaft OBR2- SHFT9, and
- At the intersection of Old School Road and Hurontario Street.

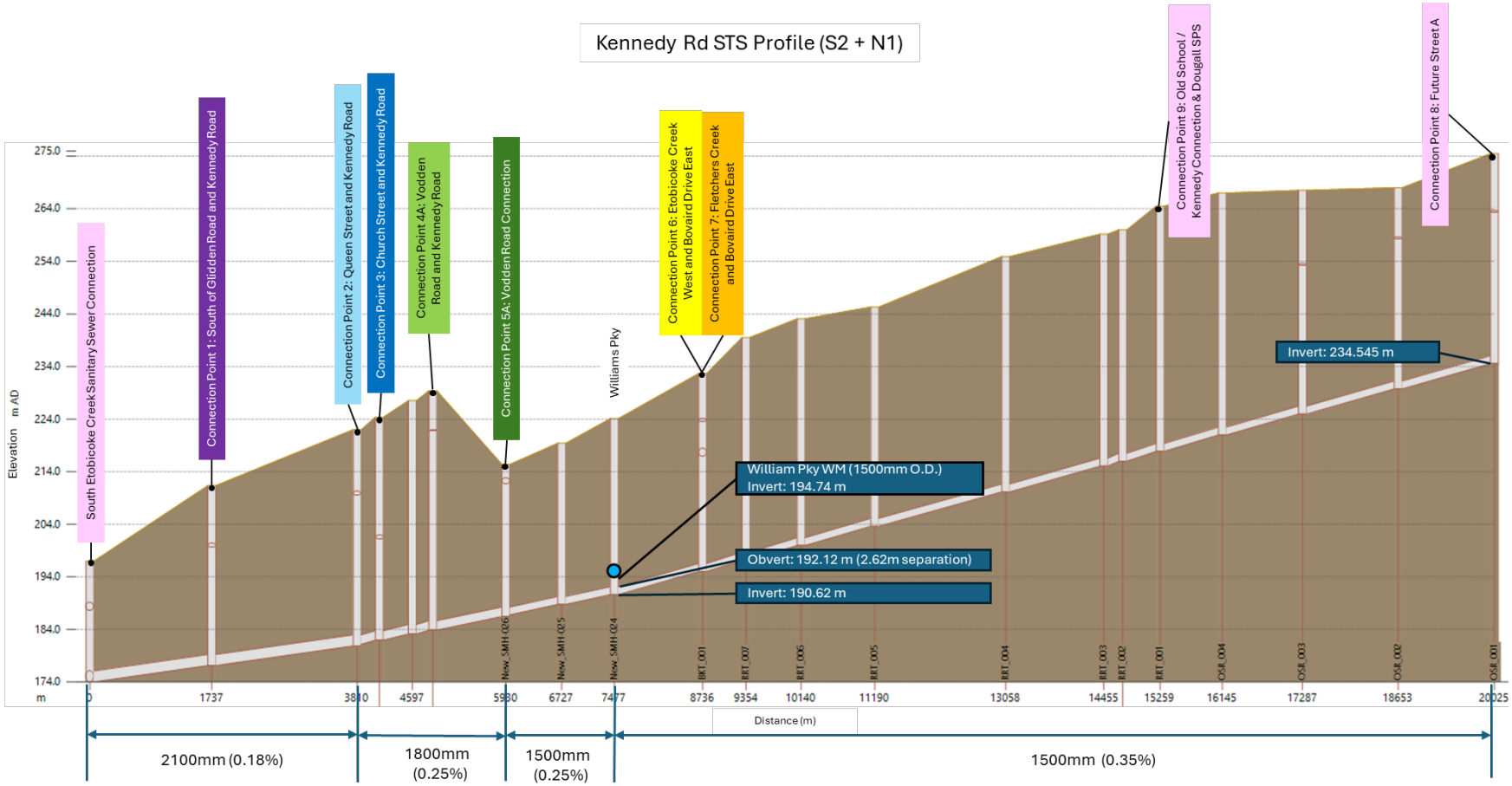
8.4 Summary of the Alignment

The total length of the proposed trunk sewer is approximately 19 kilometres. Table 8-1 summarizes the preferred design concept by segments, including preliminary depths and invert elevations. Figure 8-1 summarises the longitudinal profile of the alignment of the trunk sewer.

Table 8-1: Summary of Alignment by Segment

Segment	Length (m) of Trunk Sewer Pipe	Internal Pipe Diameter (millimetre)	Approximate Minimum Depth of Pipe Invert (metre)	Approximate Maximum depth of Pipe Invert (metre)
Segment 1	5,800	1,200 – 2,100	10.5	45.1
Segment 2	4,700	1,500 – 1,800	12.1	46.0
Segment 3	8,700	1,500	40.4	47.2

Figure 8-1: Summary of Longitudinal Alignment for the Proposed Kennedy Road STS



8.5 Construction Compound Areas

A summary of the proposed construction compounds is given in Table 8-2. These construction compounds consider the MTBM construction method for Segment 1 along Kennedy Road. If the TBM construction method is instead used along Kennedy Road, fewer shaft compounds are required, but these construction compounds would be larger in area.

Table 8-2: Summary of the Proposed Construction Compounds

Shaft Designation	Shaft Location	Total Staging Area (m^2)
K1-SHFT1	Kennedy Road South	2,227
K1-SHFT2	Kennedy Road South	1,842
K1-Glidden SHFT	Kennedy Road South / Glidden Road	1,802
K1-SHFT3	Kennedy Road South	1,099
K1-SHFT4	Kennedy Road South / Queen Street East	1,617
K1-SHFT5	Kennedy Road South / Vodden Street East	1,987
Q1-SHFT1	Queen Street East / Hansen Road North	1,135
Q1-SHFT2	Queen Street East / Rutherford Road South	1,960
V1-SHFT1	Vodden Street East (includes a diversion chamber)	4,652
OBR1-SHFT1	Vodden Street West	1,450
OBR1-SHFT2	OBR/ Williams Pkwy	4,282
PROVISIONAL SHAFT B	OBR	1,606
OBR1-SHFT3	OBR/ Bovaird Drive West	2,397
OBR2-SHFT1	OBR	1,793
OBR2-SHFT2	OBR	1,653
OBR2-SHFT3	OBR	1,587
OBR2-SHFT4	OBR/ Wanless Drive	1,997
OBR2-SHFT5	OBR	1,598
OBR2-SHFT6	OBR/ Mayfield Road	1,928
OBR2-SHFT7	OBR	1,766
OBR2-SHFT8	OBR	1,600
OBR2-SHFT9	OBR	1,600
OBR2-SHFT10	OBR/ Old School Road	2,697
OS1-SHFT1	Old School Road	1,656
OS1-SHFT2	Old School Road / Hurontario Street	2,526
PROVISIONAL SHAFT A	OBR	1,585
B3-SHFT1	Bovaird Drive West	2,261

This information will be reviewed at the detailed design stage and used to support property acquisition including easements.

8.6 Co-ordination with Other Projects

Construction of the Kennedy Road Sanitary Trunk Sewer (STS) will occur within a rapidly developing area of Brampton that includes multiple planned or ongoing municipal infrastructure projects led by the Region of Peel, the City of Brampton, and external agencies such as land developers. Proactive co-ordination with these parallel projects is essential to avoid conflicts, reduce cumulative impacts, and maintain safe and efficient operations during the construction period.

As identified through the Region of Peel's Capital Works Program and the City of Brampton's construction map, several major projects are planned or underway within or adjacent to the Kennedy Road corridor. These include, but are not limited to:

- Downtown Brampton Sanitary Sewer project
- Etobicoke Creek Sanitary Sewer project
- Queen Street Watermain Replacement Project
- Williams Parkway Watermain Project
- Tim Manley Avenue Extension and Road Improvements
- Additional Flow Program Components
- Local sanitary and watermain replacements at Queen Street/Hansen Road /Rutherford Road and Vodden Street
- Private development-driven infrastructure upgrades

These projects may overlap temporally with the Kennedy Road STS construction window (2028–2031) and require continuous communication and schedule alignment.

An integrated four-year construction window (2028–2031) will be co-ordinated by the Region of Peel and AECOM to:

- Identify overlapping critical activities
- Avoid simultaneous full closures on parallel north–south or east–west corridors
- Sequence deep utility installations to avoid rework
- Co-ordinate utility relocations so they are not performed twice

For example, Williams Parkway watermain work, ECTS work and Kennedy Road shaft construction must be staged to avoid combined closures at major intersections.

In addition to the above design coordination will occur with the City of Brampton and Town of Caledon as they begin their OBR corridor rail to trail planning and design process.

8.7 Implementation Schedule

The project is organized into three primary design packages. The Kennedy Road STS will be delivered under a single construction contract covering the full 19 kilometre tunnel length from Old School Road to the new ECTS. Awarding the work to one general contractor enables consistent construction methodology, optimized sequencing, and co-ordinated management of all shafts, tunnelling activities, utility works, and restorations across the alignment.

The overall project schedule, including major phases from preliminary design through final acceptance, is presented in Table 8-3, providing the planned start and finish dates, approximate durations, and status notes for each phase. The construction scope for the Kennedy Road Sanitary Trunk Sewer is organized into three co-ordinated design and construction packages, as also summarized in Table 8-3. Please note that utility relocations are planned to occur in 2027 prior to execution of the construction packages.

8.8 Cost-Estimate

The preliminary construction cost estimate for the Kennedy Road Sanitary Trunk Sewer Project has been developed based on the conceptual design information available as of this stage of the FLOW Central Brampton program. The estimate provides a high-level assessment of expected construction costs using a combination of quantity take-offs, database unit rates, and professional judgment.

Key steps in the development of this estimate include:

1. Scope Definition and Quantification:

   Project quantities were derived from the preliminary alignment and design parameters of the Kennedy Road Sanitary Trunk Sewer, including pipe diameters, shaft locations and depths, tunnelling lengths, and ancillary works such as maintenance holes, diversion chambers, and connections.

2. Cost Database and Benchmarking:

   Unit rates were sourced from a combination of recent comparable Region of Peel and GTA tunnelling and sewer infrastructure projects, supplemented by industry-standard cost databases and current contractor pricing trends (2024–2025). Rates include labour, equipment, materials, and indirect costs where applicable.

Table 8-3: Project Schedule Breakdown

Phase	Start Date	Finish Date	Duration (approximately)	Status / Remarks
EA & Preliminary Design	August 2024	June 2026	22 months	■ EA Phases 1–3 complete; Phase 4 (ESR Clearance) targeted for June 2026. ■ Draft PD report scheduled for end of February 2026.
Detailed Design (50 to 100%)	April 2026	October 2027	18 months	■ Design deliverables at 50%, 90%, 100%, and IFT milestones aligned.
Tendering & Award	October 2027	April 2028	6 months	■ Includes tender issue, evaluation, and award for all packages.
Construction & Post-Construction **Segment 1:** Southern segment (along Kennedy Road from north of Etobicoke Creek/First Gulf Blvd to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road) **Segment 2:** Vodden Street from Kennedy Road to OBR, and from OBR to Bovaird Drive, and along Bovaird Drive to Fletcher's Creek **Segment 3:** Northern segment along OBR to Old School Road and Old School Road to east of Hurontario Street	March 2028	February 2031	~ 35 months	■ Three packages executed concurrently; substantial completion February 2031. ■ Segment 1: Ties into the ECTS ■ Segment 2: Diversion chambers on Vodden Street and Fletchers Creek ■ Segment 3: Entirely within the OBR
Warranty / Final Acceptance	February 2031	February 2033	24 months	■ End-of-warranty acceptance targeted for Feb 2033.

3. Categorization of Costs:
   The total construction cost is structured into the following sections:
   - Section 1: General Requirements (mobilization, insurance, bonding, signage, traffic management, and commissioning)
   - Section 2: Base Construction Cost, subdivided into:
     - 2.1 Trunk Sewer Installation (micro-tunnelling and sequential excavation)
     - 2.2 Shafts
     - 2.3 Maintenance Holes
     - 2.4 Connections and Drops
   - Section 3: Site Restoration
   - Section 4: Provisional Items (potential additional shafts and maintenance holes)
   - Section 5: Miscellaneous Items
   - Section 6: Allowances (engineering, utilities, environmental, and permits)
   - Section 7: Contingency
4. Allowances and Contingency:
   An overall allowance of approximately $78.3 million and a contingency of $116.6 million have been included for the micro-tunnelling option to address uncertainties related to design progression, subsurface conditions, and market escalation. For the tunnelling option, an allowance of approximately $96.7 million and a contingency of $141.4 million have been incorporated to reflect similar project risks and cost exposure.
5. Exclusions:
   The estimate focuses on direct construction costs and does not include detailed design, land acquisition, legal, or financing costs unless captured under allowances.

Assumptions

The following key assumptions have been made in preparing this preliminary cost estimate:

1. Design Basis:
   - The trunk sewer alignment and shaft locations are assumed as per preliminary design drawings.
   - Pipe diameters of 1,200 millimetres, 1,500 millimetres, 1,800 millimetres, and 2,100 millimetres are confirmed as final sizes for each segment.
   - Micro-tunnelling is the primary method for pipe installation, except where sequential excavation may be required.

2. Rates and Escalation:
   - Unit rates reflect 2025 market conditions in the GTA and include current construction market escalation.
   - No additional escalation beyond 2025 is applied at this stage.
3. Ground Conditions and Dewatering:
   - As per geotechnical desktop study report
   - No major obstructions, contaminated soils, or rock excavation beyond typical tunnelling conditions are included.
4. Allowances and Contingencies:
   - Allowances cover environmental monitoring, utility relocations, permitting, and construction engineering support.
   - A contingency of approximately 20% has been applied to reflect the preliminary nature of the estimate and design uncertainty.
5. Exclusions:
   - Property acquisition and easement costs.
   - Future escalation beyond current-year pricing.
   - HST, financing costs, and post-construction maintenance.
   - Third-party utility betterments or relocations not yet identified

The summary of cost estimates is presented in Table 8-4 and Table 8-5 for MTBM and TBM methods, respectively.

Table 8-4: Summary of the Cost Estimate for Micro-tunnelling Method

Section	Description	Amount (CAD)
1	General Requirements	$33,170,000
2	Base Construction Cost	$391,430,000 (Sum of parts 2.1 to 2.4)
2.1	Trunk Sewer	$276,820,000
2.2	Shafts (25 shafts)	$90,190,000
2.3	Maintenance Holes	$19,520,000
2.4	Connections & Drops	$4,900,000
3	Site Restoration	$5,050,000
4	Provisional Items	$16,450,000
5	Miscellaneous	$58,720,000
6	Allowances	$78,290,000
7	Contingency	$116,620,000
Total Estimated Construction Cost		**$699,730,000**
CLASS C	20%	$839,676,000
	-20%	$559,784,000

Table 8-5: Summary of the Cost Estimate for TBM Method

Section	Description	Amount (CAD)
1	General Requirements	$33,170,000
2	Base Construction Cost	$483,690,000 (Sum of parts 2.1 to 2.4)
2.1	Trunk Sewer	$374,490,000
2.2	Shafts (23 shafts)	$86,060,000
2.3	Maintenance Holes	$18,240,000
2.4	Connections & Drops	$4,900,000
3	Site Restoration	$4,650,000
4	Provisional Items	$16,450,000
5	Miscellaneous	$72,560,000
6	Allowances	$96,740,000
7	Contingency	$141,450,000
	Total Estimated Construction Cost	**$848,710,000**
CLASS C	20%	$1,018,452,000
	-20%	$678,968,000

9. Impact Assessment and Mitigation Measures

9.1 Natural Environment Impacts and Mitigation

Potential impacts to the environment arise largely from the work associated with shafts to facilitate the proposed tunnelling activities. Table 9-1 discusses the potential impacts that are common to all of the Segments. Impacts unique to Segments 2 and 3 are addressed separately and are included in Table 9-2. There are no unique impacts in Segment 1; all potential impacts for Segment 1 are discussed in Table 9-1.

The tables include references to impacts on vegetation communities. The locations and complete Ecological Land Classification (ELC) data for the communities mentioned in this table are detailed in the *Natural Environment Report* prepared by AECOM in August 2025. The tables also refer to impacts to fish and fish habitat. Locations and details of fish habitat in the Project Study Area are also included in the Natural Environment Report prepared by AECOM in August 2025.

The potential natural environment impacts associated with the Project relate primarily to construction activities. Many of the potential impacts are commonly encountered with construction and have associated standard mitigation measures available to minimize or avoid the potential impacts (Table 9-1). These potential impacts can be prevented or controlled if appropriate measures are implemented as recommended across the entire Project.

If the potential impacts are not controlled through application of the recommended measures, they may lead to long-term impacts and significant damage to ecological features and their functions. The tables outline general best practices for reducing construction impacts as well as site-specific mitigation measures needed to manage localized impacts. The recommendations are presented at a general level of detail, with the expectation that the measures will be refined at the detailed design stage of the Project.

Both TRCA and CVC have guidelines that should be followed with respect to mitigation, avoidance, and compensation measures in their regulated areas. CVC guidelines include *the Ecosystem Offsetting Guidelines* (CVC, 2020*), Plant Selection Guidelines* (CVC, 2018*), and Healthy Soils Guidelines* (CVC, 2017*).* TRCA guidelines include *Guidelines for Determining Ecosystem Compensation* (TRCA, 2023*), Preserving and Restoring Healthy Soils: Best Practices for Urban Construction* (TRCA, 2012*), Seed Mix Guideline* (TRCA, 2022a*),* and *Flora Species Native to the TRCA Jurisdiction* (TRCA, 2022b*).*

Table 9-1: Potential Natural Environment Impacts, Mitigation and Compensation Measures that occur in all Segments

Potential Impact to Natural Environment Features	Effects	Avoidance, Mitigation, and Compensation Measures
Dust deposition on surrounding environment	■ Dust on vegetation adjacent to construction reduces photosynthesis ■ Dust in watercourse could be transported downstream to fish habitat	■ Appropriate application of dust suppressants such as water to reduce or eliminate the generation of dust from construction and earth-moving activities, areas of exposed soils and areas of concrete drilling / cutting to mitigate dust deposition into adjacent natural areas and watercourses. ■ A trained erosion and sediment control (ESC) inspector shall monitor dust suppression measures as needed, at least weekly.
Disturbance of wildlife and wildlife habitat – General	■ Displacement, disturbance or harm to wildlife in adjacent natural environment features ■ Accidental injury or mortality to wildlife, including species of conservation concern (SOCC), that may enter the construction work area ■ Disruption of life cycle processes (e.g., nesting, hibernating, etc.) resulting in injury or mortality, or impacts to breeding success (recruitment) ■ Noise, vibration and light from construction activities, may interfere with habitat use (generally expected to be temporary, short in duration and not substantially greater than existing urban impacts)	■ Wildlife observation and handling strategies shall be implemented to ensure that appropriate measures are in place for the identification, handling, translocation and reporting of wildlife, including species at risk (SAR). The strategies listed below follow the Ministry of Natural Resources and Forestry's Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders (MNRF, no date). ■ A wildlife kit shall be present on-site, made readily available, and shall include items listed in the Appendix 3 of the Ministry of Natural Resources and Forestry's Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders (MNRF, no date). ■ Construction personnel shall not approach, feed or harass wildlife; food waste will be properly stored and disposed of; and vehicles will yield to wildlife. ■ If wildlife is encountered, measures will be implemented to avoid destruction, injury, or interference with the species, and/or its habitat. For example, construction activities will cease or be reduced, and wildlife will be encouraged to move off-site and away from the construction area on its own. A qualified Biologist will be contacted if the wildlife does not leave on its own. ■ Restrict construction activities to daytime hours (sunrise to sunset) to the extent possible and outside of breeding season for any bird species identified within the Study Area. ■ Install wildlife exclusion fencing around the construction footprint as well as around storage areas and stockpiled gravel or sand (if outside of the construction footprint) prior to April 1 and maintain until the end of construction works to keep turtles and snakes from entering and potentially nesting within the construction zone. Do not feed wildlife. ■ Do not litter; garbage can attract wildlife to the work area. All garbage shall be thrown out in appropriate waste receptacles.
Soil and water contamination	■ Soil contamination from spills or leaks (e.g., grease and/or fuel) from equipment could result in groundwater effects ■ Surface water and runoff contamination (water and soil) may impair aquatic habitat	■ A Spill Prevention and Contingency Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. ■ Refuelling stations shall be located within a centralized location on-site and be at least 30 metres away from site drainage features. ■ Re-fuelling stations shall be constructed in a manner to prevent soil and/or surface and groundwater contamination from any leaks or spills and be lined with appropriate material to prevent seepage and fuel discharge. ■ An emergency response kit shall be made available at each re-fuelling station in case of a spill. ■ Train all on-site crew members operating construction vehicles in handling a potential spill and have Workplace Hazardous Materials Information System (WHMIS) training. ■ All chemical transfer/maintenance shall be conducted within the refuelling station areas. ■ Develop an ESC report and plan to reduce instances of sedimentation entering adjacent vegetation communities. ■ Implement appropriate spill prevention measures and develop spill response plan with containment/cleanup materials readily available. ■ Implement measures (i.e., work platform with tarps) to capture and contain construction debris and waste during construction over or near water. ■ Adhere to the Clean Equipment Protocol for Industry (Halloran et al., 2013).
Introduction or spread of invasive species	■ Vegetation clearing and grubbing or grading and movement of construction equipment may introduce or spread invasive species ■ Displacement of native species ■ Habitat degradation ■ Some invasive species produce harmful compounds that can affect plants, animals and humans	■ Maintain all machinery, construction equipment and vehicles arriving on site in clean condition (e.g., free of fluid leaks, or attached soil potentially containing seeds of plant material from invasive species). Inspect and wash equipment in accordance with the Clean Equipment Protocol for Industry (Halloran et al., 2013) prior to arriving and leaving the construction site. ■ Develop an Invasive Species Control Plan prior to construction. ■ Implement effective ESC plans to control runoff and potential dispersal of seeds or plant parts (propagules).

To address potential impacts of the proposed works, there are three general categories of measures identified:

- Avoidance – Avoidance involves protecting natural environment features and functions from direct impacts by keeping the works outside of natural environment features wherever possible.
- Mitigation – Mitigation involves the implementation of measures designed to eliminate or reduce indirect impacts by scheduling work at appropriate times, using best management practices to reduce risks from construction, incorporating site specific facilities or natural elements into the construction activities that reduce impacts through filtering water, providing physical separation, or controlling access.
- Compensation – Compensation involves the replacement of a feature and/or function that may be lost as a result of the construction and long-term presence of the works. It can include restoration of features and functions on site, or in some cases, replication of a function in another location.

9.1.1 Segment 1: Kennedy Road from First Gulf Boulevard to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road

For Segment 1, all shaft compounds are within built up urban areas and avoid impacts to sensitive nature heritage features including Species at Risk and their habitats. However, general Best Management Practices should be implemented as documented in Table 9-1.

9.1.2 Segment 2: Vodden Street from Kennedy Road to OBR and from OBR up to Bovaird Drive, and along Bovaird Drive to Fletcher's Creek

Refer to Table 9-1 for general Best Management Practices applicable to Segment 2 shaft compounds. Table 9-2 identifies impacts and mitigation that are unique to Segment 2.

9.1.3 Segment 3: OBR from Bovaird Drive to Old School Road and Old School Road to east of Hurontario Street

Refer to Table 9-1 for general Best Management Practices applicable to Segment 3 shaft compounds. Table 9-2 identifies impacts and mitigation that are unique to Segment 3.

Table 9-2: Potential Natural Environment Impacts, Mitigation and Compensation Measures for Segments 2 and 3.

Potential Impact to Natural Environment Feature	Proposed Shaft Compound	Potential Effects	Avoidance, Mitigation, and Compensation Measures
Loss and disturbance of vegetation communities	Segment 2 ■ V1-SHFT1A ■ OBR1-SHFT1A ■ OBR1-SHFT2B/OBR2-SHFT2A ■ Provisional Shaft B ■ OBR1-SHFT3A ■ B3-SHFT1A	**Vegetation Removal** ■ Potential removal of 0.34 ha Dry-Fresh Deciduous Hedgerow Thicket (THDM3), as a result of MTBM Shaft construction, which is 5% of the THDM3 impacted vegetation communities occurring within the Project Area ■ Potential removal of 0.23 ha Naturalized Deciduous Hedgerow Ecosite (FODM11) as a result of MTBM Shaft construction. This is 9.4% of the total FODM11 impacted vegetation communities occurring within the Project Area ■ Potential removal of 0.076 ha Cultural Savannah (CUS) as a result of MTBM Shaft construction. This is 1.9% of the total CUS impacted vegetation communities occurring within the Project Area. ■ Potential removal of 0.19 ha Deciduous Plantation (CUP1) - as a result of MTBM construction. This is 31% of the total CUP1 impacted vegetation communities occurring within the Project Area. ■ Relatively low percentages of existing habitats will be removed ■ Removal in areas surrounding the shaft construction is limited to disturbed natural areas edge habitats ■ Form and function of the remaining vegetation communities and habitats will not be significantly impaired	■ Limit vegetation removal to the extent possible. Clearly delineate vegetation clearing zones (i.e., using silt or tree protection fencing) on both construction drawings and in the field prior to clearing and grading). ■ Revegetate temporarily disturbed areas using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities. Seed mixes are to be used in conjunction with an appropriate non-invasive cover crop as needed. ■ Implement appropriate setbacks and erosion and sediment control (ESC) fencing to define the construction footprint area and prevent accidental removal.
	Segment 3 ■ OBR2-SHFT1A ■ OBR2-SHFT2A ■ OBR2-SHFT5A ■ OBR2-SHFT6A	■ Potential removal of 0.24 ha THDM3, as a result of MTBM Shaft construction. This is 5.1% of the total THDM3 impacted vegetation communities occurring within this segment. ■ Potential removal of 0.15 ha Moist Old Field Meadow (CUM1-1) as a result of MTBM Shaft construction. This is 2.7 % of the total CUM1-1 impacted vegetation communities occurring within the Project Area ■ Based on the percentage of potential vegetation removal, minimal vegetation loss within vegetation communities in natural environment features is anticipated ■ Vegetation removal will occur in areas surrounding the shaft construction located in disturbed natural areas and limited to edge habitat. This will not affect the form and function of the vegetation communities	

Potential Impact to Natural Environment Feature	Proposed Shaft Compound	Potential Effects	Avoidance, Mitigation, and Compensation Measures
Accidental intrusion into Vegetation Communities	Segment 2 ■ V1-SHFT1A ■ OBR1-SHFT1A ■ OBR1-SHFT2B / OBR2-SHFT2A ■ Provisional Shaft B ■ OBR1-SHFT3A ■ B3-SHFT1A Segment 3 ■ OBR2-SHFT1A ■ OBR2-SHFT2A ■ OBR2-SHFT5A ■ OBR2-SHFT6A ■ OBR2-SHFT10A	■ Incidental intrusion into the adjacent vegetation communities from machinery, equipment, etc. ■ Damage to tree rooting zone immediately adjacent to areas of grading and excavation. ■ Soil compaction by machinery in areas adjacent to natural heritage features affects trees' ability to absorb nutrients and water. ■ Structural damage to adjacent vegetation by operation of heavy machinery (broken tree limbs etc.).	■ Clearly delineate vegetation clearing zones (i.e., using silt or tree protection fencing) on both construction drawings and in the field prior to clearing and grading to prevent accidental damage to vegetation or intrusion into adjacent vegetation areas ■ Limiting tree removal to the extent possible. ■ Root pruning of adjacent trees during grading and excavation. ■ Tree protection fencing should be installed prior to initiation of the work and shall remain in place until construction activities conclude, as per the City's tree protection guidelines.
Loss of potential bat species at risk (SAR) habitat	Segment 2 ■ V1-SHFT1A ■ OBR1-SHFT1A ■ OBR1-SHFT2B/OBR2-SHFT2A ■ Provisional Shaft B ■ OBR1-SHFT3A ■ B3-SHFT1A	■ Less than one hectare of woodland communities (CUS1, FODM11, and CUP1) will be removed for construction of the MTBM shafts ■ No cavity trees were found within the Construction Disturbance Area (CDA) ■ Vegetation removal will be limited to edge habitat, as these communities are located along existing roadways/railways and are already subjected to anthropogenic disturbances	■ Limit vegetation removal to the extent possible. Clearly delineate vegetation clearing zones (i.e., using silt or tree protection fencing) on both construction drawings and in the field prior to clearing and grading to prevent accidental damage or intrusion to adjacent vegetation or Ecological Land Classification communities. ■ Schedule tree removal within the CUS1, FODM1, and CUP1 outside of the bat active season (April 1 to November 30), to avoid injury or mortality of bats.
Loss of candidate Red-headed Woodpecker habitat	Segment 2 ■ V1-SHFT1A ■ OBR1-SHFT1A ■ OBR1-SHFT2B/OBR2-SHFT2A ■ Provisional Shaft B ■ OBR1-SHFT3A ■ B3-SHFT1A	■ Less than one hectare of woodland communities (CUS1, FODM11, and CUP1) will be removed for construction of the MTBM shafts ■ Candidate habitat for the Red-headed Woodpecker is potentially located in CUS1, FODM11 and CUP1, where vegetation removal will occur ■ No nesting cavity trees were identified within the CDA	■ Limit vegetation removal to the extent possible. Clearly delineate vegetation clearing zones (i.e., using silt or tree protection fencing) on both construction drawings and in the field prior to clearing and grading to prevent accidental damage or intrusion to adjacent vegetation or Ecological Land Classification communities ■ Schedule tree removal outside of the breeding bird season (April 1 to August 31), to avoid potential impacts to Red-headed Woodpecker.
Damage and disturbance to adjacent natural environment features	Segment 2 ■ V1-SHFT1A ■ OBR1-SHFT1A ■ OBR1-SHFT2B/OBR2-SHFT2A ■ Provisional Shaft B ■ OBR1-SHFT3A ■ B3-SHFT1A Segment 3 ■ OBR2-SHFT1A ■ OBR2-SHFT2A ■ OBR2-SHFT5A ■ OBR2-SHFT6A ■ OBR2-SHFT10A	■ Incidental intrusion into the adjacent vegetation communities from machinery, equipment, etc. ■ Damage to tree rooting zone immediately adjacent to areas of grading and excavation ■ Soil compaction by machinery in areas adjacent to natural environment features affect trees' ability to absorb nutrients and water ■ Structural damage to adjacent vegetation by operation of heavy machinery (broken tree limbs, etc.)	■ Clearly delineate vegetation clearing zones (i.e., using silt or tree protection fencing) on both construction drawings and in the field prior to clearing and grading to prevent accidental damage to vegetation or intrusion into adjacent vegetation areas. ■ Limit tree removal to the extent possible. ■ Restore temporarily disturbed areas with native plants appropriate to site conditions and affected vegetation community. ■ Root pruning of adjacent trees during grading and excavation. ■ Install tree protection fencing prior to initiation of the work and shall remain in place until construction activities conclude, as per the City's tree protection guidelines.

Potential Impact to Natural Environment Feature	Proposed Shaft Compound	Potential Effects	Avoidance, Mitigation, and Compensation Measures
Migratory bird nest and egg destruction	Segment 2 ■ V1-SHFT1A ■ OBR1-SHFT1A ■ OBR1-SHFT2B/OBR2-SHFT2A ■ Provisional Shaft B ■ OBR1-SHFT3A ■ B3-SHFT1A Segment 3 ■ OBR2-SHFT4A ■ OBR2-SHFT5A ■ OBR2-SHFT6A ■ OBR2-SHFT7 ■ OBR2-SHFT8A ■ OBR2-SHFT9A ■ MTBM-Provisional Shaft A ■ OBR2-SHFT10A ■ OS1-SHFT1A ■ OS1-SHFT2A	■ Disturbance or destruction of migratory bird nests – vegetation communities provide breeding habitat and movement corridors for a variety of wildlife, including SAR, Species of Conservation Concern (SOCC) and/or migratory birds protected under the Migratory Birds Convention Act (MBCA) ■ Vegetation (i.e., trees, shrubs and ground cover) removal or structure demolition/rehabilitation has the potential to destroy migratory bird nests and eggs, which are protected under the MBCA, if conducted during the overall bird nesting period of April 1 to August 31	■ Comply with the MBCA, including removing trees and vegetation outside of the general bird nesting period (April 1 to August 31). ■ If vegetation disturbance is necessary during the general nesting period, an experienced and qualified Biologist shall complete nest searches no more than 48 hours prior to vegetation removal. An appropriately sized buffer where no construction activities are to occur will be established around an active MBCA-protected nest until the young have fledged and the nest is deemed no longer active by a qualified Biologist. ■ If a nest of a migratory bird is found outside of this nesting period (including a ground nest) it still receives protection. ■ All stockpiled materials of soil, overburden or similar materials are to be maintained at 70 degrees or less by sloping off stockpiles to creak a slot angle that will not support nesting breeding birds during the breeding bird season (April 1 to August 31). ■ Avoid vegetation removal within the active breeding bird season (April 1 – August 31) to avoid disturbing nesting birds and contravening the MBCA.
Disturbance to fish species and their habitat, including SAR habitat	Segment 2 ■ V1-SHFT1A ■ OBR1-SHFT2A / OBR1-SHFT2B ■ Provisional Shaft B ■ OBR1-SHFT3A ■ B3-SHFT1A Segment 3 ■ OBR2-SHFT4A ■ OBR2-SHFT5A ■ OBR2-SHFT6A ■ OBR2-SHFT10A	■ Potential release of sediments or deleterious substances to fish habitat, resulting from spills or equipment leaks ■ Fish mortality ■ Habitat degradation or loss	■ Machinery shall not enter watercourses, even if a channel is dry, and machinery movement in the vicinity of watercourses shall be kept to a minimum. ■ Machinery, construction equipment, and vehicles shall be cleaned at least 30 away from any watercourse, waterbody, and ideally on mud free, gravel covered, hard surface or well-maintained grassy area (e.g., parking lots or manicured lawns). ■ Develop a detailed ESC Report and plan prior to construction to reduce erosion potential and minimize sediment release to adjacent vegetation communities and watercourses. The following principles shall be incorporated to minimize sedimentation and erosion: • Minimize the duration of soil exposure, • Retain existing vegetation, where feasible, • Encourage re-vegetation, • Divert runoff away from exposed soils, • Keep runoff velocities low, and • Trap sediment as close to the source as possible. ■ Develop a Spills Response Plan prior to construction to avoid/minimize contaminant release to the adjacent natural areas, particularly the watercourses. As part of the Spills Response Plan: ■ Re-fuelling stations shall be located within a centralized location on-site at least 30 metres away from watercourses or wetlands. ■ Re-fuelling stations shall be constructed in a manner to prevent soil, and/or surface and groundwater contamination from any leaks or spills. ■ An emergency response kit shall be made available at each re-fuelling station in case of a spill.

Potential Impact to Natural Environment Feature	Proposed Shaft Compound	Potential Effects	Avoidance, Mitigation, and Compensation Measures
			■ All on-site crew members operating construction vehicles shall be appropriately trained in handling a potential spill and have Workplace Hazardous Materials Information System Training. ■ All chemical transfer/maintenance shall be conducted within the refuelling station areas. ■ Drip pans shall be placed under all equipment (e.g., generators) within 30 metres of a watercourse, drainage feature, or wetland. ■ Where vegetation removals are necessary for construction activities (i.e., at shaft locations and connection points), areas shall be revegetated with native tress, shrubs, and forbs to restore allochthonous inputs to downstream aquatic habitat. Conditions shall match or exceed preconstruction conditions. If plantings are not feasible, riparian seed mix shall be used.
Emergency in water work could cause a potential disturbance to fish species and their habitat, including SAR habitat	Segment 2 ■ V1-SHFT1A ■ OBR1-SHFT2A / OBR1-SHFT2B ■ Provisional Shaft B ■ OBR1-SHFT3A ■ B3-SHFT1A Segment 3 ■ OBR2-SHFT4A ■ OBR2-SHFT5A ■ OBR2-SHFT6A ■ OBR2-SHFT10A	■ Harmful alteration, disruption, or destruction (HADD) of fish habitat or death of fish	■ Use trenchless methods to avoid in-water works. Where shaft compounds and open cut methods are proposed, appropriate mitigation measures must be in place. ■ Machinery shall not enter watercourses, even if a channel is dry, and machinery movement in the vicinity of watercourses shall be kept to a minimum. ■ Submit a Request for Review (RfR) to Fisheries and Oceans Canada (DFO) if emergency in-water works are required.
Risk of frac-out (an accidental release of drilling mud) when using trenchless watercourse crossings causing a potential disturbance to fish species and their habitat	Segment 2 ■ V1-SHFT1A ■ OBR1-SHFT2A / OBR1-SHFT2B ■ Provisional Shaft B ■ OBR1-SHFT3A ■ B3-SHFT1A Segment 3 ■ OBR2-SHFT4A ■ OBR2-SHFT5A ■ OBR2-SHFT6A ■ OBR2-SHFT8A ■ OBR2-SHFT9A ■ MTBM-Provisional Shaft A ■ OBR2-SHFT10A ■ OS1-SHFT1A ■ OS1-SHFT2A	■ Release of bentonite and / or fluids into watercourse increasing sediment load to watercourse ■ Emergency work in water or floodplain ■ Fish mortality ■ Habitat degradation or loss	■ Develop a Contingency Plan for Trenchless Failure to identify high-risk operation and corresponding mitigation measures. Contingency measure to be included in the plan are as follows: • A qualified construction inspector shall be present onsite throughout micro-tunnelling operations to visually assess the working area for signs of ground instability, erosion, sediment migration, or environmental impacts. • The site inspector should visually monitor the watercourse for several days during the crossing works to ensure that bentonite does not enter the watercourse during the tunnelling period. The obvert of the tunnel should be positioned at least 5 metres below the creek bed and within competent ground. • Any indication of ground movement outside acceptable thresholds, or frac-out from MTBM shall trigger an immediate review and potential suspension of tunnelling operations. • All groundwater inflow within shafts must be directed to an on-site settlement tank to remove sediment and suspended solids. • Sediment and erosion controls (silt fencing, mud mats, berms, geotextile filters) shall be installed and maintained in all working areas, consistent with the contract documents and environmental permits. ■ Excavated material generated from micro-tunnelling and shaft construction shall be sampled frequently to verify that soil meets MECP waste classification and landfill acceptance criteria.

Potential Impact to Natural Environment Feature	Proposed Shaft Compound	Potential Effects	Avoidance, Mitigation, and Compensation Measures
Soil and Water Contamination	Segment 2 ■ V1-SHFT1A ■ OBR1-SHFT1A ■ OBR1-SHFT2B / OBR2-SHFT2A ■ Provisional Shaft B ■ OBR1-SHFT3A ■ B3-SHFT1A Segment 3 ■ OBR2-SHFT1A ■ OBR2-SHFT2A ■ OBR2-SHFT5A ■ OBR2-SHFT6A ■ OBR2-SHFT10A	■ Soil contamination as a result of spills (e.g., grease and/or fuel) from equipment use. ■ The use of machinery and vehicles on site could result in spills or leaks of oil, gasoline and other fluids which could enter the surrounding natural communities. These impacts can be limited and even avoided with proper machinery inspections and maintenance and establishing areas away from natural heritage features dedicated to re-fuelling and storing machinery.	■ A Spill Prevention and Contingency Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. ■ Refuelling stations should be located within a centralized location on-site, and be at least 30 metres away from wetlands, watercourses, waterbodies or other site drainage features. ■ Re-fuelling stations should be constructed in a manner to prevent soil and/or surface and groundwater contamination from any leaks or spills and be lined with appropriate material to prevent seepage and fuel discharge. ■ An emergency response kit should be made available at each re-fuelling station in case of a spill. ■ All on-site crew members operating construction vehicles should be appropriately trained in handling a potential spill and have Workplace Hazardous Materials Information System (WHMIS) training. ■ All chemical transfer/maintenance should be conducted within the refuelling station areas. ■ An ESC plan will be developed to reduce instances of sedimentation entering adjacent vegetation communities. ■ Implement appropriate spill prevention measures and develop spill response plan with containment/cleanup materials readily available. ■ Implement measures (i.e., work platform with tarps) to capture and contain construction debris and waste during construction over or near water. ■ Adherence to the Clean Equipment Protocol for Industry (Halloran et al., 2013).
Temporary loss of riparian vegetation, including aquatic SAR habitat	Segment 2 ■ V1-SHFT1A ■ OBR1-SHFT2A / OBR1-SHFT2B ■ Provisional Shaft B ■ OBR1-SHFT3A ■ B3-SHFT1A Segment 3 ■ OBR2-SHFT4A ■ OBR2-SHFT5A ■ OBR2-SHFT6A ■ OBR2-SHFT10A	■ Soil compaction, and vegetation clearing, grubbing, and grading can result in discharge of sediment laden runoff into nearby watercourses, particularly from the proposed open cut areas at Etobicoke and Fletchers Creeks ■ Changes in riparian vegetation can alter the food sources available for Redside Dace (*Clinostomus elongatus*) in Fletchers Creek ■ Direct impact to aquatic species by clogging the gills of fish, covering fry and eggs within the substrate, and by reducing the ability of species to find prey ■ Impairment of aquatic system by impacting water quality and chemistry as well as nutrient cycles	■ Minimize the area of disturbance. ■ Impacts to Redside Dace Critical Habitat at Fletchers Creek above the two-year high-water mark will require consultation with DFO through submission of an RfR. This consultation will determine the requirement for approval (e.g., Letter of Advice, Fisheries Act Authorization, and/or SARA permit). All mitigation measures set out by DFO in their approval must be adhered to. ■ Where open cut methods are proposed at Etobicoke Creek, appropriate mitigation measures (ESC) must be in place. ■ An ESC plan shall be developed prior to construction that includes BMP's, such as those described on DFO's Measures to Protect Fish and Fish Habitat website (DFO, 2025), and installation of ESC measures such as silt fencing prior to construction activities. ■ Use water as a dust control measure to reduce the generation of dust from equipment. ■ Restore and re-stabilize disturbed work areas and banks as soon as possible.

9.2 Archaeology Impacts and Mitigation

Based on the results of the Stage 1 Archaeological Assessment and subsequent analysis and refinement of shaft compound locations, the following areas require additional Stage 2 Archaeological Assessment prior to ground disturbing activities associated with the project.

The following areas require additional Archaeological Assessment:

9.2.1 Segment 1: Kennedy Road from First Gulf Boulevard to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road

Shaft compound areas along Segment 1 that require further archaeological assessment are listed in Table 9-3.

Figure 9-1 shows archaeological assessment results in Segment 1.

Table 9-3: Segment 1 Shafts Requiring Archaeological Assessment

Shaft	Archaeological Potential
K1-SHFT1A	Stage 1-2 AA Required
K1-SHFT2E	Stage 1-2 AA Required
K1-SHFT2A	Stage 1-2 AA Required
K1-SHFT3D	Stage 1-2 AA Required
K1-GliddenSHFT	Stage 1-2 AA Required
Q1-SHFT1A	Stage 1-2 AA Required
K1-SHFT5A	Stage 2 AA Required

Figure 9-1: Archaeological Assessment Results in Segment 1





- Sanitary Trunk Sewer (STS) Connections
- Preferred Route
- Preferred Route 120m Buffer
- MTBM Shaft Compound Preferred
- TBM Shafts

Previously Completed Assessments

- Stage 1 Completed
- Stage 1-2 Completed
- Stage 2 Completed

Archaeological Assessment Results

- Visually Confirmed Disturbance
- Stage 2 Required
- Sloped Area
- Wet
- Paved - Further Archaeological Assessment Required
- Non Paved - Further Archaeological Assessment Required

Flow | Central Brampton
Kennedy Road STS

Archaeological Assessment Results
Recommended Preferred Route

0 130 260 390 520 650
Meters
Scale: 1:16,000

N

PN: 60736820	Figure 9-1
February 17, 2026	AECOM

Data Sources:
Government of Ontario, Region of PEEL

Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Pro\ProjectOverview.aprx **Layout:** F10 Results Preferred Route New buffer
Date Saved: January 26, 2026 **User:** WangS12

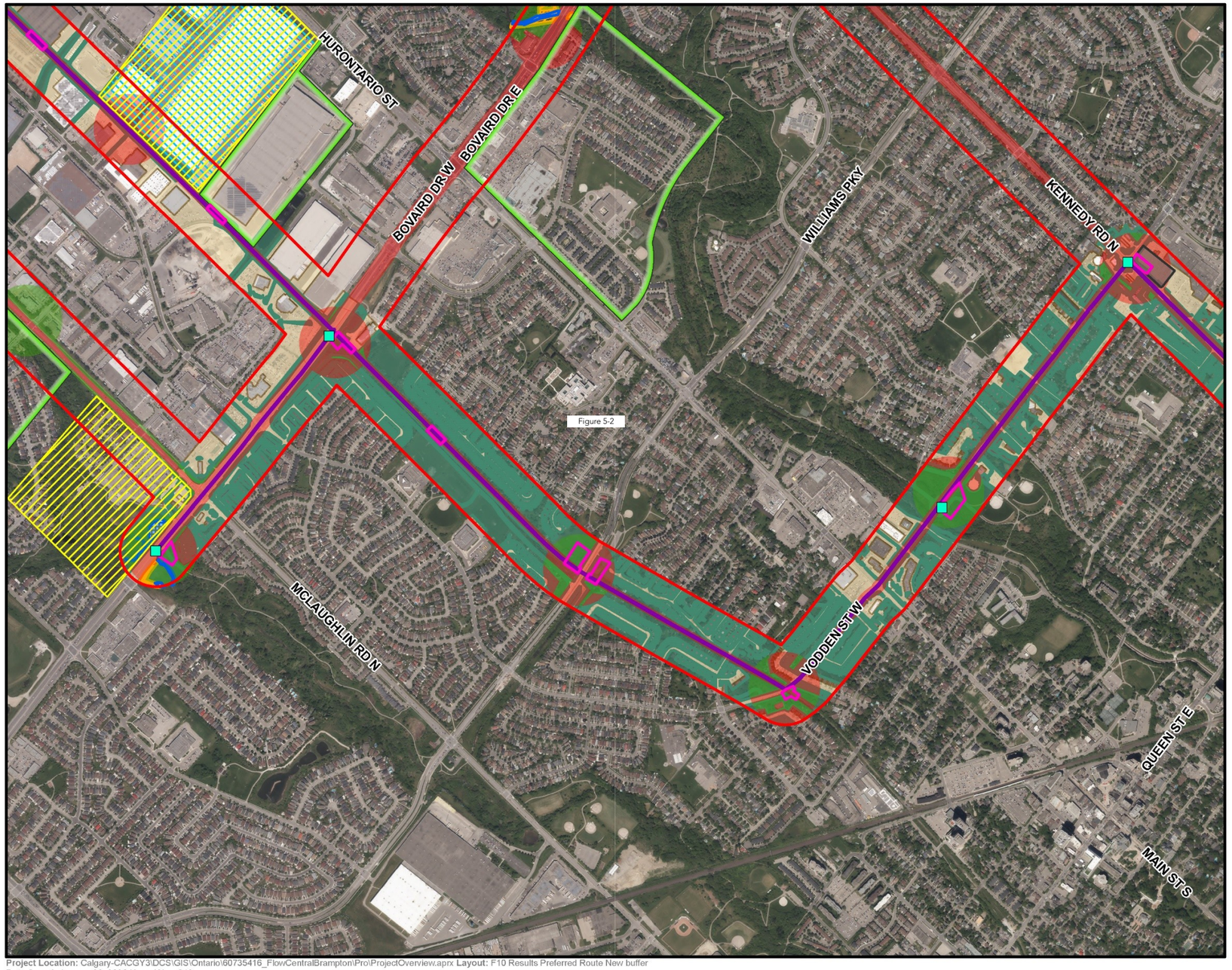
9.2.2 Segment 2: Vodden Street from Kennedy Road to OBR and from OBR up to Bovaird Drive, and along Bovaird Drive to Fletcher's Creek

Shaft compound areas along Segment 2 that require further archaeological assessment are listed in Table 9-4. Figure 9-2 shows archaeological assessment results in Segment 2.

Table 9-4: Segment 2 Shafts Requiring Archaeological Assessment

Shaft	Archaeological Potential
V1-SHFT1A	Stage 2 AA Required
OBR1-SHFT1A	Stage 2 AA Required
OBR1-SHFT2B	Stage 2 AA Required
OBR1-SHFT2A	Stage 2 AA Required
B3-SHFT1A	Stage 2 AA Required
Provisional SHFTB	Stage 2 AA Required

Figure 9-2: Archaeological Assessment Results in Segment 2





Sanitary Trunk Sewer (STS) Connections
Preferred Route
Preferred Route 120m Buffer
MTBM Shaft Compound Preferred
TBM Shafts

Previously Completed Assessments
Stage 1 Completed
Stage 1-2 Completed
Stage 2 Completed

Archaeological Assessment Results
Visually Confirmed Disturbance
Stage 2 Required
Sloped Area
Wet
Paved - Further Archaeological Assessment Required
Non Paved - Further Archaeological Assessment Required

Flow | Central Brampton
Kennedy Road STS

Archaeological Assessment Results
Recommended Preferred Route

0 100 200 300 400 500
Meters
Scale: 1:12,000
N

PN: 60736820	Figure 9-2
February 17, 2026	AECOM

Data Sources:
Government of Ontario, Region of PEEL

Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Pro\ProjectOverview.aprx **Layout:** F10 Results Preferred Route New buffer
Date Saved: January 26, 2026 **User:** WangS12

9.2.3 Segment 3: OBR from Bovaird Drive to Old School Road and Old School Road to east of Hurontario Street

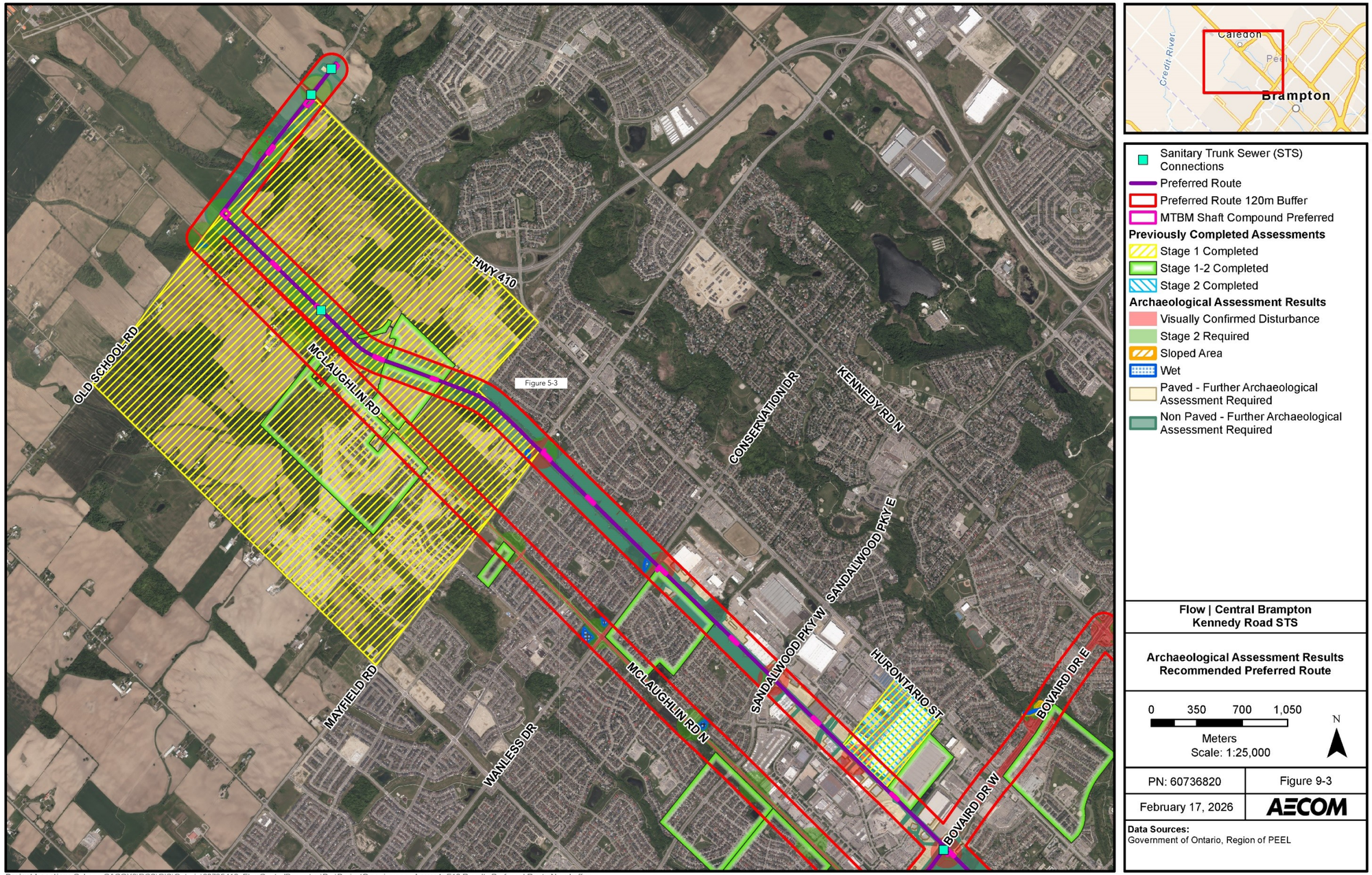
Shaft compound areas along Segment 3 that require further archaeological assessment are listed in Table 9-5.

Figure 9-3 shows archaeological assessment results in Segment 3.

Table 9-5: Segment 3 Shafts Requiring Archaeological Assessment

Shaft	Archaeological Potential
OBR2-SHFT4A	Stage 2 AA Required
OBR2-SHFT6A	Stage 2 AA Required
OBR2-SHFT8A	Stage 2 AA Required
OBR2-SHFT10A	Stage 2 AA Required
OS1-SHFT1A	Stage 2 AA Required
OS1-SHFT2A	Stage 2 AA Required

Figure 9-3: Archaeological Assessment Results in Segment 3



Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Pro\ProjectOverview.aprx **Layout:** F10 Results Preferred Route New buffer
Date Saved: January 26, 2026 **User:** WangS12

9.2.4 Stage 2 and 3 Archaeological Assessment Overview and MCM Acceptance

All Stage 2 and Stage 3 assessments will be conducted to meet the requirements of the Ontario Ministry of Citizenship and Multiculturalism's (MCM) Standards and Guidelines for Consultant Archaeologists (Ontario Government 2011). The Stage 2 field investigation will consist of the physical inspection of the lands to be impacted by the project. The Stage 2 field methodology will be dependant on the subject property's current conditions of the lands. For lands that are grassed and treed or wooded areas, the Stage 2 field investigation will consist of test pit survey at 5 metre intervals involving the hand excavation of roughly 30 cm diameter test pits with all soils screened through 6 millimetre mesh hardware cloth; for lands that are active agricultural fields, the Stage 2 field investigation will consist of a pedestrian survey at 5 metre intervals involving walking back and forth in transects across the field to observe any artifacts on the ground surface. All fields must be ploughed to meet MCM requirements.

If required, a Stage 3 assessment will involve the hand excavation of a series of 1 m^2 test units across the site area on a 5 metre grid, followed by the hand excavation of infill units equating to 20% of the grid unit total. If any subsurface cultural features are uncovered, the features must be recorded, covered in geotextile, and all units will be backfilled.

If cultural materials are found during the Stage 2 and Stage 3 field work, all cultural materials will be retained for laboratory analysis and each piece will be washed and catalogued according to material, type, and time period, with a sample of each category photographed for inclusion in the report.

It is part of the licencing requirements that all archaeological field work conducted in Ontario be documented in a report for submission to the MCM for review and acceptance to ensure that the work meets the requirements of the MCM's *Standards and Guidelines for Consultant Archaeologists* (Ontario Government 2011).

If undocumented archaeological artefacts are encountered during construction, all work affecting the site shall cease immediately and the proponent shall notify MCM and engage a licensed consultant archaeologist to carry out further archaeological assessment, in compliance with Section 48(1) of the *Ontario Heritage Act*. If the archaeological material includes human remains, the police or coroner shall also be notified.

Lastly, it should be noted that properties that are subject to archaeological assessment are not considered cleared for ground disturbance activities until the associated report recommending no further archaeological concern, has been reviewed and accepted by the MCM. In order to maintain compliance with the MCM and the *Ontario Heritage Act* (1990), no ground disturbing activities are to occur until the proponent receives a formal

letter from the MCM stating that the recommendations provided herein are compliant and that the report has been entered into the Ontario Public Register of Archaeological Reports.

9.3 Built-Heritage Resources and Cultural Heritage Landscapes Impacts and Mitigation

AECOM completed the *Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment* (AECOM 2026) for the Recommended Preferred Route and potential shaft locations identified in Phase 2 of the EA. Based on data collection including a review of the municipal heritage register, consultation with municipal and provincial agencies, a field review, application of the Ministry of Citizenship and Multiculturism (MCM) Criteria Checklist, and professional knowledge and experience, a total of twelve (12) Cultural Heritage Landscapes (CHLs) and Built Heritage Resources (BHRs) were identified by AECOM along the Preferred Route.

It is important to note that the majority of shaft compounds on the preferred route have low or no heritage value and no further study is required. However, the entire OBR corridor is considered to have potential heritage value related to its historical rail corridor function and as such will require further study.

Based on the preliminary assessment in the Cultural Heritage Report, CHERs were recommended to be completed during Preliminary Design for CHL 1, BHR 2, CHL 3, CHL 5, and CHL 7. Mitigation measures outlined in the *Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment* (AECOM 2026) should also be applied to CHL 2, which may experience direct impacts despite not being formally designated.

However, as design has been refined and Shaft Compound Alternatives have been identified, it is necessary to update the associated impact assessments and mitigation measures. Please refer to the sections below for the revised details.

9.3.1 Segment 1: Kennedy Road from First Gulf Boulevard to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road

Based on the Preferred MTBM Shaft Compound locations no BHRs or CHLs will be impacted. Therefore, no further heritage work is required for Segment 1.

9.3.2 Segment 2: Vodden Street from Kennedy Road to OBR and from OBR up to Bovaird Drive, and along Bovaird Drive to Fletcher's Creek

Based on the Preferred MTBM Shaft Compound locations, CHL 3 (OBR) is anticipated to be directly adversely impacted by the Project, while no BHRs are anticipated to be impacted. CHL 3 (OBR) is anticipated to be directly adversely impacted by OBR1 shaft compounds 1-3A, OBR1 shaft compounds 2B and Provisional Shaft B.

9.3.3 Segment 3: OBR from Bovaird Drive to Old School Road and Old School Road to east of Hurontario Street

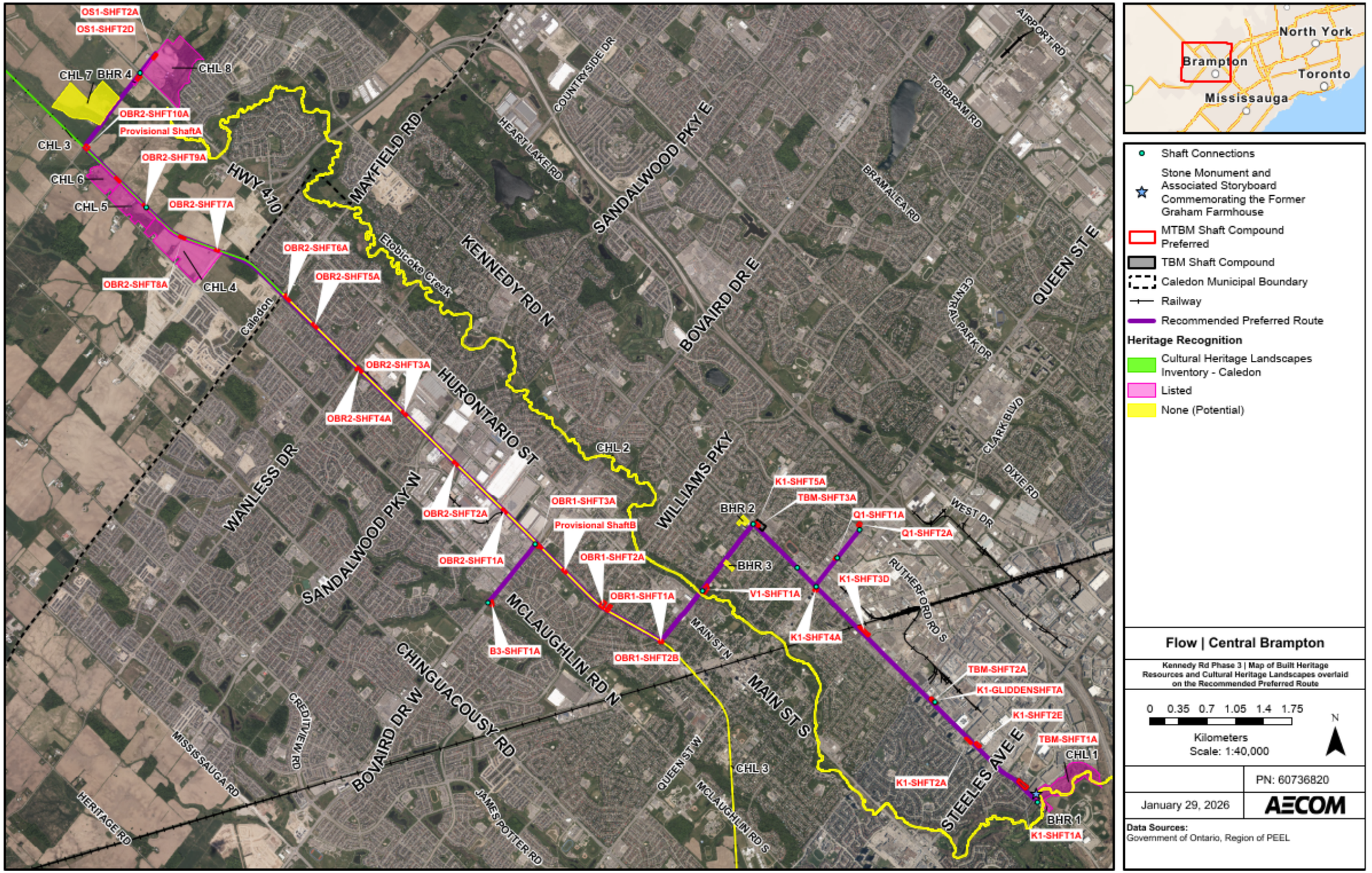
Based on the Preferred MTBM Shaft Compound locations, CHL 3 (OBR) and Provisional Shaft A are anticipated to be directly adversely impacted by the Project, while no BHRs are anticipated to be impacted. CHL 3 is anticipated to be directly adversely impacted by the OBR2 shaft compounds 1A-10A and it is recommended that a Cultural Heritage Evaluation Report (CHER) be completed for CHL 3 by a Qualified Person to determine whether the property has further cultural heritage value. If CHL 3 is determined to have Cultural Heritage Value or Interest (CHVI) and direct adverse impacts remain, a Heritage Impact Assessment (HIA) should be undertaken to assess potential impacts and identify appropriate mitigation measures.

While CHL 8 is anticipated to be impacted by OS1-SHFT2A, the impacts are minor and confined to a small area just north of the property's driveway. No potential heritage attributes are anticipated to be directly adversely impacted. Therefore, no further heritage work is required to mitigate impacts to CHL 8.

Construction activities should be carefully managed through worker awareness, defined construction limits, and no-go zones to prevent inadvertent impacts. Any temporarily disturbed landscapes should be restored to pre-construction conditions, and if project limits or impacts change, a Qualified Person(s) should review this Cultural Heritage Report and revise these recommendations as required.

See Figure 9-4 below, which identifies the CHLs and BHRs located along the Recommended Preferred Route.

Figure 9-4: Built Heritage Resources and Cultural Heritage Landscapes



9.4 Impacts to Surface and Groundwater

9.4.1 Segment 1: Kennedy Road from First Gulf Boulevard to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road

All 8 shafts in Segment 1 will be constructed using a sealed shaft method, such as secant piles, slurry wall shafts or segmental lining installed by wet caisson method, through the soil and into the top of the rock. This will eliminate the need for groundwater drawdown and prevent inflow during excavation. Use of such methods will prevent settlement of adjacent soils or impacts to nearby utilities, pavements or structures due to dewatering. The sealed shaft method also minimizes the potential for drawdown impacts on private wells, foundations, tree root systems, and buried utilities.

Depending on the permeability of the rock mass, alternative method may be used to continue the excavation through the rock, such as segmental lining installed by underpinning, sprayed concrete, rock bolts or a combination of these.

Tunnels along this segment will be constructed using specialized micro-tunnel boring machines designed for operation in saturated, mixed-ground conditions. The closed-face MTBM maintains face pressure and prevents groundwater inflow. No groundwater pumping or drawdown is required along the alignment.

Lubrication, slurry circulation, and spoil removal are fully contained systems, preventing water discharge to the environment. Tunnel liners and joints are designed to be watertight, preventing long-term groundwater infiltration. Overall, the tunnelling method has negligible impact on both groundwater quantity and quality.

Within each designated working compound, Ground surface preparation will involve removal of topsoil to a depth of up to 300 millimetres. Select trees or vegetation within the compound will be removed for safe access and shaft construction. Following construction, all compounds will be fully restored to original or improved condition in accordance with the local municipality and Region of Peel restoration standards. Restoration may include replacement planting, topsoil reinstatement, turfing, paving, and boulevard improvements. There is no long-term impact anticipated to surface drainage patterns or vegetation once restoration is complete.

9.4.2 Segment 2: Vodden Street from Kennedy Road to OBR and from OBR up to Bovaird Drive, and along Bovaird Drive to Fletcher's Creek

All 5 shafts in Segment 2 will be constructed using a sealed shaft method, such as secant piles, slurry wall shafts or segmental lining installed by wet caisson method, through the soil and into the top of the rock. This will eliminate the need for

groundwater drawdown and prevent inflow during excavation. Use of such methods will prevent settlement of adjacent soils or impacts to nearby utilities, pavements or structures due to dewatering. The sealed shaft method also minimizes the potential for drawdown impacts on private wells, foundations, tree root systems, and buried utilities.

Depending on the permeability of the rock mass, alternative method may be used to continue the excavation through the rock, such as segmental lining installed by underpinning, sprayed concrete, rock bolts or a combination of these.

Similar to Segment 1, Tunnels along this segment will be constructed using specialized micro-tunnel boring machines (MTBMs) designed for operation in saturated, mixed-ground conditions. The closed-face MTBM maintains face pressure and prevents groundwater inflow. No groundwater pumping or drawdown is required along the alignment.

Within each designated working compound, Ground surface preparation will involve removal of topsoil to a depth of up to 300 millimetres. Select trees or vegetation within the compound will be removed for safe access and shaft construction. Following construction, all compounds will be fully restored to original or improved condition in accordance with the local municipality and Region of Peel restoration standards. Restoration may include replacement planting, topsoil reinstatement, turfing, paving, and boulevard improvements. There is no long-term impact anticipated to surface drainage patterns or vegetation once restoration is complete.

In Segment 2, the proposed diversion chambers on Vodden Street and Bovaird Road will be constructed within the same working areas as the shafts.

9.4.3 Segment 3: OBR from Bovaird Drive to Old School Road and Old School Road to east of Hurontario Street

All 13 shafts in Segment 3 will be constructed using a sealed shaft method, such as secant piles or segmental lining installed by wet caisson method, through the soil and into the top of the rock. This will eliminate the need for groundwater drawdown and prevent inflow during excavation. Use of such methods will prevent settlement of adjacent soils or impacts to nearby utilities, pavements or structures due to dewatering.

Depending on the permeability of the rock mass, alternative method may be used to continue the excavation through the rock, such as segmental lining installed by underpinning, sprayed concrete, rock bolts or a combination of these.

The pipes along this segment will be installed by closed face micro tunnel boring machine, designed for operation in saturated, mixed-ground conditions. The closed-face MTBM maintains face pressure and prevents groundwater inflow. Furthermore, water ingress at the joints between jacking pipes should be negligible. Thus, no groundwater pumping or drawdown is required along the alignment.

The lubrication, slurry circulation, and spoil removal are fully contained systems, preventing water discharge to the environment. Overall, the tunnelling method has negligible impact on both groundwater quantity and quality.

Within each designated working compound, Ground surface preparation will involve removal of topsoil to a depth of up to 300 millimetres. Select trees or vegetation within the compound will be removed for safe access and shaft construction. Following construction, all compounds will be fully restored to original or improved condition in accordance with the local municipality and Region of Peel restoration standards. Restoration may include replacement planting, topsoil reinstatement, turfing, paving, and boulevard improvements. There is no long-term impact anticipated to surface drainage patterns or vegetation once restoration is complete.

9.4.4 Management of Potentially Contaminated Groundwater and Dewatering

Applicable to all 3 segments, to adequately address the management of potentially contaminated groundwater and dewatering practices and associated discharge impacts, the following mitigation plans will be completed during detailed design phase:

- Conduct comprehensive groundwater sampling during hydrogeological investigations to properly characterize groundwater conditions. Contaminants of concern (COCs) will be identified, and groundwater quality will be assessed against Provincial Water Quality Objectives (PWQO) and/or applicable sewer bylaws, depending on the discharge location. This is particularly important where discharge may occur directly to watercourses or indirectly via storm sewers or overland flow.
- Develop a discharge dewatering and discharge management plan prior to construction. Appropriate on-site treatment or disposal methods will be established before discharge. Where no significant contamination is present, total suspended solids (TSS)/turbidity will be the primary parameter requiring management.
- Erosion and Sediment Controls (ESCs) will be properly installed, regularly inspected and maintained to achieve intended performance and minimize impacts to receiving water bodies.

9.4.5 Hydrogeological Impacts

It is recognized that hydrogeological assessment is at a preliminary stage and a formal review by MECP will be required when the more comprehensive Hydrogeological

Impact Assessment Report (HIAR) is available. The following measures will be addressed during detailed design:

- Due to seasonal fluctuations, groundwater levels will be monitored over multiple seasons to obtain sufficient data for design purposes.
- A door-to-door private well survey will be completed as an early component of the design stage. A monitoring and mitigation plan will be developed to address potential water well interference or related complaints associated with the project.
- For any segment of the project requiring dewatering, a geotechnical assessment will be conducted to evaluate potential subsidence-related issues such as structural impacts due to the dewatering activities within a radius at least twice that of the estimated zone of influence. The assessment will include a monitoring and mitigation strategy to address any identified risks. In addition, where applicable (e.g., artesian conditions), the geotechnical assessment will evaluate the potential risk of basal heave.
- A groundwater quality assessment will be included for any authorized water taking application to ensure that water quality is maintained and potential contamination risks are addressed. An impact assessment will be conducted by a Qualified Person to evaluate the effects of dewatering on the surrounding environment and other water resource users. Based on this assessment, a monitoring and mitigation plan may need to be developed to prevent any undesirable impacts.
- To safeguard groundwater and surface water resources, the design of any open cut municipal service corridors along the project will incorporate trench barrier mechanisms. These barriers should prevent the horizontal and vertical migration of contaminants through disturbed soils.
- The preceding items will be documented in the HIAR. The geotechnical assessment may be documented as a summary of a standalone report, combined with the HIAR or included as an appendix to the HIAR.
- Excess Soil generated throughout the project will be handled in accordance with the requirements of O. Reg. 406/19 ("On-Site and Excess Soil Management") and its supporting documents.

9.5 Fluvial Geomorphological Impacts and Mitigation

When wastewater infrastructure is located within the meander belt and anticipated scour depth of a watercourse, it is assumed to be at elevated risk from fluvial processes that can compromise its integrity over time. The meander belt represents the lateral zone where the river is most likely to migrate due to natural channel dynamics such as

erosion and deposition. The scour depth represents the vertical depth that a watercourse is likely to erode from the original bed level of a watercourse over time due to erosion. These processes can significantly affect buried or exposed infrastructure.

For wastewater infrastructure, the following considerations are critical:

1. Risk factors – Channel bed and bank erosion and channel migration may cause pipes, connection points, and manholes to become exposed or undermined as the river erodes its bed/banks and shifts laterally. Additionally, over time bed scour and bank undercutting could lead to structural failure. Although open cut connection points within the meander belt are temporary, care must be taken to plan for how to deal with excessive water should a high flow event occur during construction. During construction any alteration to the bankfull channel will have to be restored back to existing conditions or better.
2. Design Considerations – Pipes should be buried below the anticipated scour depth and be protected as appropriate.
3. Monitoring and Maintenance – For infrastructure within the meander belt regular inspections should occur over time to determine whether infrastructure is at risk. Inspection after major storm events is also recommended to detect early signs of exposure or damage. Employ an adaptive management process and plan for potential relocation or reinforcement if, and where channel migration accelerates.

To identify the impacted area, as part of the baseline natural features assessment AECOMs Fluvial Geomorphology team delineated the meander belt and 100-year erosion rate for all defined features that will be crossed as part of the proposed design. Guidance documents used to guide these assessments included:

- MNR's Technical Guide on River and Stream Systems: Erosion Hazard Limit (MRN, 2002),
- CVC's Fluvial Geomorphic Guidelines (CVC, 2015),
- CVC's Technical Guidelines for Water Crossings (CVC, 2019),
- Parish Geomorphic Ltd.'s Belt Width Delineation Procedures (Parish Geomorphic Ltd., 2024), and
- TRCA's Crossing Guideline for Valley and Stream Corridors (TRCA, 2015).

Additionally, recommended burial depths were provided for crossings based on a bed scour assessment which was performed in accordance with CVC's Fact Sheet VI: Scour Analysis (CVC, 2019).

If infrastructure is necessary within the meander belt or predicted 100-year scour depth of the watercourse, the infrastructure should be designed assuming it will be in contact with the watercourse channel in the future, taking into consideration the base elevation of the channel and an allowance for downcutting over time.

9.5.1 Segment 1: Kennedy Road from First Gulf Boulevard to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road

No proposed shaft locations are located within the meander belt of a watercourse.

9.5.2 Segment 2: Vodden Street from Kennedy Road to OBR and from OBR up to Bovaird Drive, and along Bovaird Drive to Fletcher's Creek

The following shaft locations are located within the meander belt of a watercourse as described below in Table 9-6.

Table 9-6: Segment 2 Shaft Locations

Shaft ID	Fluvial Reach ID	Intersection	Potential Impacts
V1-SHFT1A	WC-04 (Etobicoke Creek)	Vodden Street East	■ The feature was realigned upstream of Vodden Street East prior to 1999. Additionally, the feature received a transitional/ stressed RGA rating and there was abundant evidence of channel widening. Other evidence of instability included an accumulation of cobbles within the Vodden Street East crossing structure and scour pools downstream of the Vodden Street East crossing where the stormwater outfalls were discharging into the watercourse. ■ Proposed shaft crossing is located within the meander belt of WC-04 and variables impacting channel migration and scour over time (i.e., significant flood events, urbanization, watercourse modifications, etc.) may change from contemporary conditions.
OBR1-SHFT2A or OBR1-SHFT2B	WC-05/WC-05A	Williams Parkway	■ WC-05a was noted to be channelized between 1970 and 1999 with significant residential development occurring in the vicinity of the reach since 1999. However, the field assessment and RGA indicated that the feature is In Regime and only minor evidence of erosion was noted. Overall, it appears to be relatively stable. ■ WC-05 was fully lined with concrete prior to 1999. Because of this, no RGA was completed, and no evidence of erosion was observed. For this reason, no scour assessment or meander belt assessment/ 100-year erosion rate was delineated for WC-05. It is assumed that the concrete will be kept in good repair over the lifespan of the proposed infrastructure. ■ Proposed shaft crossing is located within the meander belt of WC-05 and WC-05A and variables impacting channel migration and scour over time (i.e., significant flood events, urbanization, watercourse modifications, etc.) may change from contemporary conditions.
OBR1-SHFT3A	WC-07/ WC-6A	Bovaird Drive	■ WC-07 was channelized between 1970 and 1999 with significant residential development occurring in the vicinity of the reach since 1999. However, the field assessment and RGA indicated that the feature is In Regime with limited evidence of channel widening and bed degradation. ■ WC-06A was also channelized between 1970 and 1999 with significant residential development around the reach. The field assessment noted more significant erosion within this watercourse including abundant evidence of channel widening and lesser evidence of aggradation. The feature received a transitional/stressed RGA rating. ■ Proposed shaft crossing is located within the meander belt of WC-07 and WC-06A and variables impacting channel migration and scour over time (i.e., significant flood events, urbanization, watercourse modifications, etc.) may change from contemporary conditions.
Provisional Shaft B	WC-05A	Bovaird Drive	■ WC-05A was also channelized between 1970 and 1999 with significant residential development around the reach. While the RGA identified that the feature can be considered In Regime/Stable, at the upstream end of the reach the channel banks have been armoured for approximately 100 metres and in some areas, the armourstone has failed and has been displaced within the channel. The channel is artificially confined in this area. ■ Proposed shaft crossing is located near the active channel and within the meander belt of WC-05A. Variables impacting channel migration and scour over time (i.e., significant flood events, urbanization, watercourse modifications, etc.) may change from contemporary conditions.
B3-SHFT1A	WC-08 (Fletchers Creek)	Bovaird Drive	■ WC-08 was likely straightened prior to 1970 with significant residential development occurring in the vicinity of the reach since. The field assessment and RGA indicated that the reach is in a transitional/stressed state with abundant evidence of channel widening and aggradation. Live stake restoration was observed at this location and is likely being used to mitigate erosion issues in the reach. ■ Proposed shaft crossing is located within the meander belt of WC-08 and variables impacting channel migration and scour over time (i.e., significant flood events, urbanization, watercourse modifications, etc.) may change from contemporary conditions.

9.5.3 Segment 3: OBR from Bovaird Drive to Old School Road and Old School Road to east of Hurontario Street

The following shaft locations are located within the meander belt of a watercourse as described below in Table 9-7:

Table 9-7: Segment 3 Shaft Locations

Shaft ID	Fluvial Reach ID	Intersection	Potential Impacts
OBR2-SHFT10A	WC-33	Old School Road	■ The feature was realigned in 1999 but no significant changes to the channel planform have occurred since. Additionally, only minor erosion was noted and was attributed to being from the steepness of the ditch wall and not due to erosion from flows within the watercourse. Therefore, the existing watercourse is relatively stable under contemporary conditions. ■ Proposed shaft crossing is located within the meander belt of WC-33 and variables impacting channel migration and scour over time (i.e., significant flood events, urbanization, watercourse modifications, etc.) may change from contemporary conditions.

9.6 Grading and Excavation Impacts and Mitigation

Grading and excavation activities are required at shaft locations, diversion chambers, maintenance holes, and connection structures along the Kennedy Road Sanitary Trunk Sewer alignment. While the trunk sewer itself is installed by trenchless methods, surface-level grading is still required to establish safe working platforms, access roads, and construction compounds.

9.6.1 Segment 1: Kennedy Road from First Gulf Boulevard to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road

Segment 1 lies almost entirely within a dense urban corridor, surrounded by residential neighbourhoods, commercial frontages, and continuous utilities within the roadway cross-section. Grading impacts in this segment are closely tied to preparing small, highly constrained compounds for launch/reception shafts, maintaining traffic operations, and ensuring safe pedestrian access along Kennedy Road and Queen Street

East. Limited surface area requires tight vertical realignments of existing boulevards and localized cut-and-fill to establish level working pads.

Excavation impacts include the development of deep shafts within narrow rights-of-way, temporary support systems adjacent to utilities, and removal of small areas of boulevard/sidewalk to create working space. Because of the proximity to homes, driveways, and businesses, construction staging must minimize disruption and maintain safe access at all times.

Mitigation measures include:

- Limiting grading extents to the minimum footprint needed for shaft compounds.
- Using temporary decking, traffic diversions, and pedestrian hoarding to maintain access and safety.
- Providing utility support/shoring where excavations occur adjacent to high-density service corridors.
- Restoring disturbed boulevards, sidewalks, and landscaping immediately after shaft decommissioning.

9.6.2 Segment 2: Vodden Street from Kennedy Road to OBR and from OBR up to Bovaird Drive, and along Bovaird Drive to Fletcher's Creek

Segment 2 transitions from the constrained urban environment of Vodden Street to the OBRY corridor, where ground profiles vary and vegetation is more common. Grading requirements include establishing stable construction pads along Vodden Street and forming level working areas within the OBRY corridor where natural slopes, vegetation, and uneven surfaces exist.

Excavation impacts arise from constructing shafts in mixed corridor environments, as well as localized cut-and-fill to install diversion chambers at Etobicoke Creek and Fletcher's Creek. Additional excavation is required for future connection chambers at key tie-in points along Bovaird Drive and the OBR alignment.

Mitigation measures include:

- Designing graded work areas to maintain existing drainage patterns within the abandoned OBRY corridor.
- Providing temporary slope support where shafts are placed near embankments or grade breaks.

- Protecting utilities along Vodden Street through staged excavation and temporary shoring.
- Restoring disturbed sections of the OBRY corridor and adjacent greenbelt areas with appropriate topsoil, grading, and seed mix.

9.6.3 Segment 3: OBR from Bovaird Drive to Old School Road and Old School Road to east of Hurontario Street

Segment 3 passes through the northern OBR corridor and transitions into a more open, semi-rural environment, where larger construction compounds are feasible and utility density is considerably lower. Grading impacts include preparing expansive working pads for deeper shafts, improving access routes, and managing drainage in areas with variable natural grades.

Excavation impacts are generally less constrained compared to Segments 1 and 2, consisting of deep shafts, tie-in structures, and limited localized ground modification. The rural sections of Old School Road may require minor cut-and-fill to accommodate equipment and haul routes, but impacts are typically confined to municipal right-of-way and open land.

Mitigation measures include:

- Establishing granular working platforms to reduce long-term disturbance and provide stable access.
- Implementing erosion and sediment controls along the OBR corridor and rural road edges.
- Maintaining natural drainage patterns across open land and reinstating ditches or swales where temporary grading modifies them.
- Restoring disturbed rural areas through re-grading, topsoiling, and reseeding consistent with existing conditions

9.7 Traffic Impacts and Mitigation

The traffic assessment analyzed the broader City and Regional Road network considering multiple concurrent construction projects to identify network capacity concerns. The shaft compound locations along Kennedy Road, Vodden Street, Queen Street, the OBR corridor, and Old School Road were assessed to identify localized construction impacts to vehicle traffic, transit, cyclists, and pedestrians.

With multiple concurrent construction projects and lane closures between 2027 and 2030, it is critical to co-ordinate the various construction projects to maintain as many available travel lanes, pedestrian and cyclist facilities, and transit facilities as possible

and manage congestion. The traffic impact assessment informs the preparation of traffic management plans and identifies mitigative measures to lessen construction impacts where possible for all travel modes (transit, active transportation, auto). All temporary traffic control measures will comply with OTM Book 7 guidelines.

The Brampton Travel Demand Model is based on the "GTAModel" created by the Demand Modelling Group of the University of Toronto. The City of Brampton provided models for the 2031 and 2041 horizon years. In discussion with Peel Region and the City of Brampton, it was determined that the 2031 EMME model is most reasonable for use in assessing impacts as it is closest to the anticipated time of construction (2027 to 2030). Table 9-8 provides a summary of the current EMME model status and anticipated use for Flow Program projects.

Table 9-8: Traffic Model (EMME) Status

Model Owner – Model Type	Model Purpose
City of Brampton – EMME	Assessment of lane closures and network impact analysis to identify capacity issues as well as assist with determining detour requirements during construction
Development Timeline for Flow Program	**Date**
Modelling scope discussed with Region/City	March 2025
City 2031 model selected for Flow Program	April 2025
City updates model to reflect land use projections	June to August 2025
Flow Program team evaluates model for use in the study	July to August 2025
Model is used for lane closure assessment in the Riverwalk assignment	August 2025
Model inputs are updated to incorporate other anticipated construction projects as a base model	September to November 2025
Model is used for network impact assessment in the Kennedy Road STS EA	November to December 2025
Model was approved by the Region for near-term use on the following assignments: Queen Street Watermain Design and Downtown Brampton Environmental Assessment	January 2026
When will this model be used going forward?	
The model will be used for multiple assignments such as Environmental Assessments, Preliminary through Detailed Design, as well as during Construction.	

Several assumptions have been determined through the development of modelling scenarios, including the following:

- For the travel demand modelling exercise, we have assumed that there will be a worst-case scenario where there are lane closures throughout all three

segments (representing the three separate contracts) at the same time to accommodate each shaft compound that impacts adjacent lanes. This includes lane closures at four shaft compound locations along Kennedy Road, one location along Queen Street, and three locations along Old School Road. It is assumed that there are no lane closures for the shaft compounds on Vodden Street. There are also anticipated lane closures (one-lane) on Glidden Road, First Gulf Boulevard, and Clarence Street.

- The schedule for each shaft compound construction staging area will vary. The construction period for most shafts is 9 to 12 months; however, some deep drop structures and diversion chambers may take as long as 15 to 18 months to complete.

Using the City of Brampton Active Construction Map, the Peel Region Projects map, and in consultation with other projects that are part of the Region's Flow Program, the traffic team gathered as much information as possible on current construction projects, their timelines, and potential transportation network impacts. Where detailed information was unavailable, the traffic team made and documented assumptions on potential lane closures (identified in the separate Traffic Impact Assessment Report).

Traffic diversions associated with construction activities were quantified by comparing each EMME staged scenario with its corresponding EMME base scenario; the resulting percentage changes in volumes for each approach capture the expected diversions. These percentage changes were then applied to the future base volumes to generate the final total future traffic volumes which were consequently used in the intersection operational analysis with Synchro 11 software.

Signal timing optimization and potentially excessive queues should be reviewed at a later design stage once the input parameters such as concurrent construction projects and lane closure assumptions are further refined. Potentially new seasonal TMC data can be collected at intersections of concern for use in an updated assessment at the detailed design stage.

The following discussion on each of the three segments identifies impacts and mitigation measures for each segment by vehicle traffic, active transportation and transit travel modes. Impacts are identified first, followed by suggested mitigation measures. The following assessment considers only the preferred shaft locations.

The Traffic Report, which expands on the assessment below, is under review by the Region/City, and further updates may be made prior to completing the ESR.

9.7.1 Segment 1: Kennedy Road from First Gulf Boulevard to Vodden Street, including Queen Street from Rutherford Road to Kennedy Road

Segment 1 includes the following shaft compounds: K1-SHFT1A, K1-SHFT2[6], TBM-SHFT2A / K1-GLIDDEN SHFTA, K1-SHFT3D, K1-SHFT4A, K1-SHFT5A, Q1-SHFT1A, Q1-SHFT2A.

Vehicle Traffic

There are several potential lane closures along Kennedy Road that are required to accommodate the shaft compound construction staging area and extend into the road right-of-way, including [7]:

- One-lane closure (northbound or southbound on Kennedy Road depending on final shaft location) for shaft compound K1-SHFT2, and one lane closure at shafts K1-SHFT1A (First Gulf Blvd), K1-SHFT3D (Clarence Street), and Q1-SHFT1A (Queen Street).
- Two lane closures at TBM-SHFT2A/K1-GLIDDENSHFTA, including a one lane-closure on northbound Kennedy Road (north approach of Kennedy Road / Glidden Road intersection) and one lane closure on westbound Glidden Road (east approach of Kennedy Road / Glidden Road intersection)
- Two lane closures at K1-SHFT4, including a one lane-closure on southbound Kennedy Road (south approach of Kennedy Road / Queen Street intersection) and one lane closure on eastbound Queen Street (west approach of Kennedy Road / Queen Street intersection)
- No lane closures at K1-SHFT5A and Q1-SHFT2A.

Due to shaft compound locations that extend into the road right-of-way, as noted above, the resulting lane reductions also result in posted speed reductions. Speeds are reduced to 50 kilometres per hour to accommodate both the taper length requirement where traffic is shifted to the adjacent lane in advance of the lane closure as well as through the construction zone.

6. There are two potential "preferred" locations for K1-Shaft 2: Alternative K1-SHFT2A on the west side and Alternative K1-SHFT2E on the east side of Kennedy Road, south of Rambler Drive. In Alternative K1-SHFT2A, one southbound through lane would be closed, whereas in Alternative K1-SHFT2E, one northbound through lane would be closed. In both alternatives, the sidewalk on the shaft side would be closed, requiring pedestrians to be redirected to the opposite side of Kennedy Road, and one bus stop would need to be temporarily relocated to the nearest accessible location. Overall, while the pedestrian and transit adjustments are similar between the two options, the key difference remains the extent of through lane impacts.
7. A separate one-lane closure on Kennedy Road is anticipated at the Etobicoke shaft location. This location is outside the scope of the Kennedy Road Sanitary Trunk Sewer study led by AECOM and will be addressed by others. However, the study considers the potential cumulative and concurrent effects of construction activities at this and other shaft locations.

Considering the above noted shaft compound locations and lane closure details for the Kennedy Road STS EA along with other anticipated and concurrent construction projects[8], the study corridor was assessed to identify impacts along Kennedy Road and adjacent corridors. As a first step the existing conditions were modelled and it was identified that several major roadways are currently operating at capacity and will continue to operate at capacity during the simultaneous construction projects, including:

- Bovaird Drive (eastbound in the AM peak)
- Steeles Avenue (eastbound in the AM peak)
- McLaughlin Road (southbound in the AM peak)

Figure 9-5 shows the roadways currently operating at capacity (e.g., Bovaird Drive, identified in orange) and roadways operating at capacity due to all assumed concurrent construction projects within the study area (identified in red) in the AM peak. Figure 9-6 show the same information except for the PM peak. As shown in these two figures, within Segment 1, the following roadways were identified as operating at capacity in 2027 due to the simultaneous ongoing construction project:

- Queen Street (eastbound in the AM and PM peak, westbound in the PM peak)
- Orenda Street (eastbound in the AM peak, westbound in the PM peak)
- Clarence Street (eastbound in the AM peak, westbound in the PM peak)
- Steeles Avenue (westbound in the PM peak)
- Main Street (southbound in the AM peak)
- Kennedy Road (southbound in the AM peak)

8. Details of the assumed construction schedules and lane closures for the other identified concurrent construction projects are identified in the Traffic Impact Assessment report.

Figure 9-5: AM Peak Road Network Capacity Impacts during Construction (Segment 1)

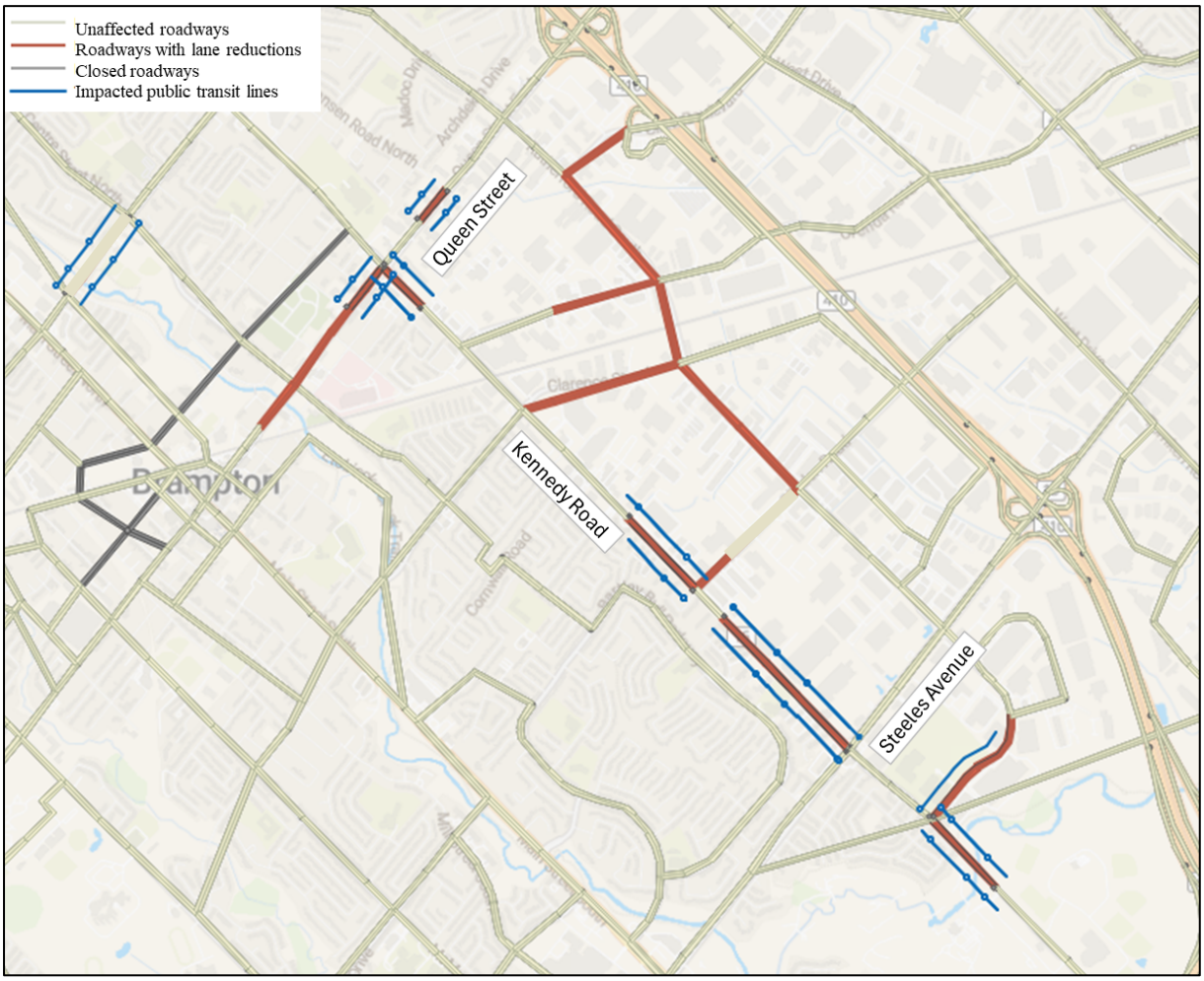


Figure 9-6: PM Peak Road Network Capacity Impacts during Construction (Segment 1)



The anticipated road closures, lane reductions and transit impacts, including assumed construction projects that will be underway concurrent with the Kennedy Road STS construction, are shown below in Figure 9-7.

Figure 9-7: Anticipated Roadway and Transit Impacts during Construction (Segment 1)



The identified lane closures are anticipated to contribute to delays at intersections along Kennedy Road in Segment 1. The Synchro intersection operational analysis determined the following:

- To accommodate projected traffic volumes, signal timing plans will need to be optimized at the intersection of Kennedy Road / Clarence Street.
- The lane configuration at Kennedy Road / Glidden Road will need to be modified to minimize northbound queues in the PM peak, as discussed in the Traffic Report.

There are two companies that have LCV permits to operate on Steeles Avenue, First Gulf Boulevard and Kennedy Road. The Traffic Management Plans may need to account for the larger turning movements of LCVs depending on the configuration of any lane closures that restrict available space where LCVs operate. The LCV operators should be

informed of the upcoming construction work and lane closures so they can adjust their own operating schedules (within permit restrictions) if they see fit. MTO should also be consulted to confirm whether a potential long-term closure would require any adjustments to the LCV permits, such as an extension of the restricted operating periods to minimize potential delays at signalized intersections due to LCV turning movements including the left-turn movement from First Gulf Boulevard to Kennedy Road which would depend on the final lane closure configuration at First Gulf Boulevard and south of this intersection on Kennedy Road.

There are no recommended detours within Segment 1.

Active Transportation

There are several potential sidewalk closures along Kennedy Road, Queen Street, and Vodden Street that are required to accommodate the shaft compound construction staging area, including:

- Sidewalk closure (east side of Kennedy Road) for shaft compounds K1-SHFT1A, TBM-SHFT2A/K1-GLIDDENSHFTA
- Sidewalk closure (north side of Queen Street) for shaft compounds Q1-SHFT1A and Q1-SHFT2A.
- Sidewalk closure (east or west side depending on final shaft location) for shaft compound K1-SHFT2.
- Dual sidewalk closures in southwest quadrant of the Kennedy Road / Queen Street intersection for shaft compound K1-SHFT4. Detour via the adjacent plaza was identified but considered not viable for travel between Kennedy Road and Vodden Street. Pedestrians will also need to be redirected along a safe alternate route to the opposite side of Kennedy Road / Queen Street.
- Sidewalk closures in the southeast quadrant of the Kennedy Road / Vodden Street intersection for shaft compound K1-SHFT5A.

The eastbound bicycle lane on the west leg of the Kennedy Road / Vodden Street intersection is expected to remain open at the Vodden Street / Kennedy Road intersection. Appropriate signage for necessary detours and corresponding pavement markings for temporary bicycle lanes should be implemented to alleviate impacts incurred to the active transportation network.

Public Transit

Minor transit delays are expected as buses travel along areas of Kennedy Road and Queen Street that see lane reductions due to planned construction staging areas. Routes 7, 10 and 200 bus stops near First Gulf Blvd (for K1-SHFT1), Rambler Drive, and Queen Street will need to be relocated to accommodate the shaft compound

construction staging areas. These bus stops should be relocated to the nearest accessible location to mitigate impacts to transit riders.

9.7.2 Segment 2: Vodden Street from Kennedy Road to OBR and from OBR up to Bovaird Drive, and along Bovaird Drive to Fletcher's Creek

Segment 2 includes the following shaft compounds, V1-SHFT1A, OBR1-SHFT1A, Provisional SHAFTB, OBR1-SHFT2[9], B3-SHFT1A, and Provisional Shaft B.

Vehicle Traffic

There are no anticipated lane closures due to the shaft compound construction locations identified in Segment 2. It is anticipated that vehicle lanes will be shifted north on Vodden Street at V1-SHFT1A to avoid the shaft compound, but that both eastbound and westbound travel lanes will remain open.

Because of construction traffic (i.e., construction vehicles), localized delays are expected at the Vodden Street / Centre Street intersection and at the Vodden Street / Ken Whillans Drive intersection. Accordingly, the signal timing plan at the Vodden Street / Ken Whillans Drive intersection should be adjusted. Warning signs will be required on Bovaird Drive to notify motorists of adjacent construction zones.

As noted in Segment 1, the existing conditions were modelled and several major roadways are currently operating at capacity and will continue to operate at capacity during the simultaneous construction projects, including:

- Bovaird Drive (eastbound in the AM peak)
- Vodden Street (eastbound in the AM peak, westbound in the PM peak)

Figure 9-8 shows the roadways withing Segment 2 that are currently operating at capacity (e.g., Bovaird Drive, identified in orange) and roadways operating at capacity due to all assumed concurrent construction projects within the Study Area (identified in red) in the AM peak. Figure 9-9 show the same information except for the PM peak. As shown in these two figures, within Segment 2, the following roadways were identified as operating at capacity in 2027 due to the simultaneous ongoing construction project:

- Williams Parkway (eastbound in the AM peak, westbound in the PM peak)

9. There are two potential "preferred" locations for OBR1-SHFT2. OBR1-SHFT2B is south of Williams Parkway, and OBR1-SHFT2A is north of Williams Parkway.

Figure 9-8: AM Peak Road Network Capacity Impacts during Construction (Segment 2)

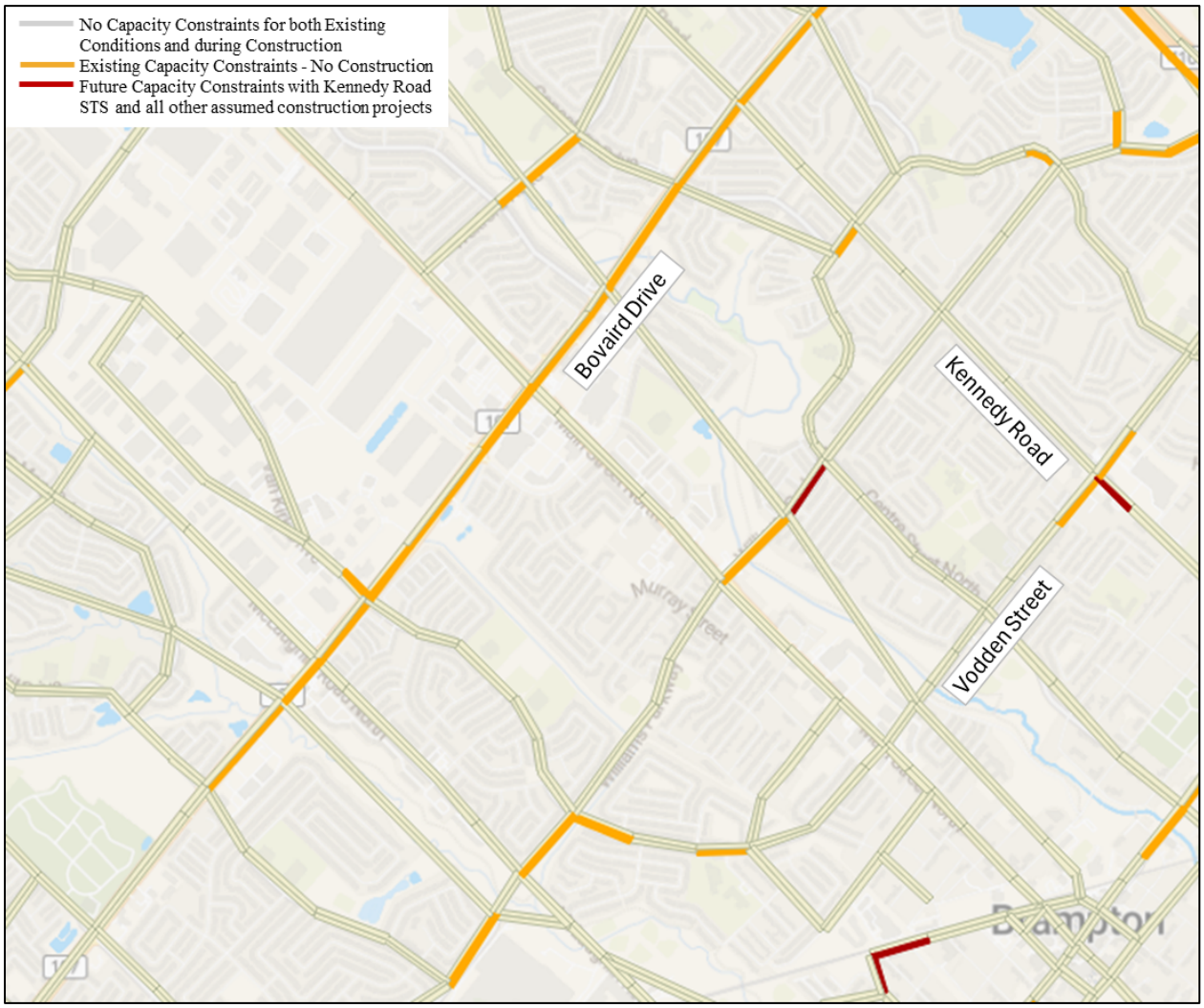
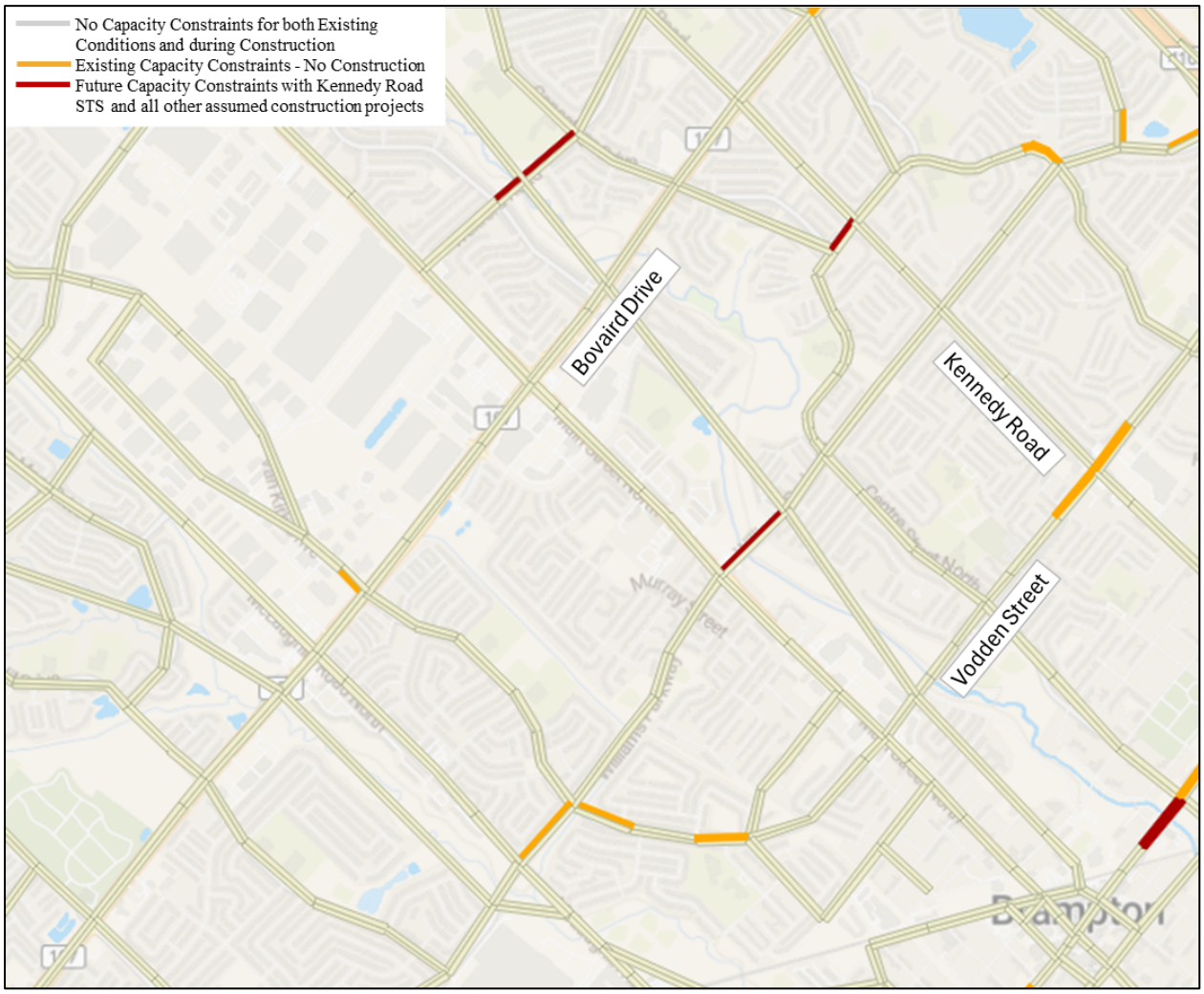
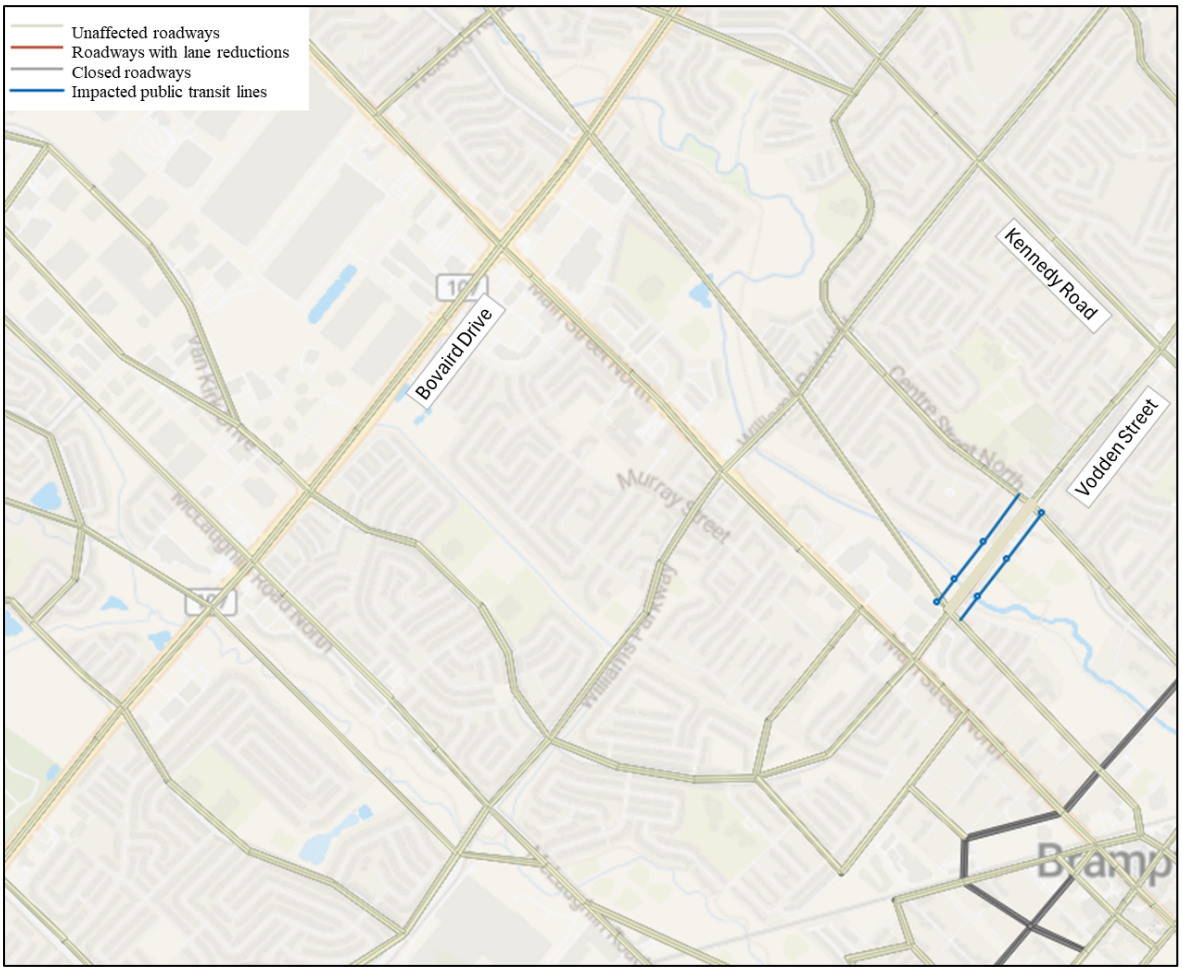


Figure 9-9: PM Peak Road Network Capacity Impacts during Construction (Segment 2)



The anticipated road closures, lane reductions and transit impacts, including assumed construction projects that will be underway concurrent with the Kennedy Road STS construction are shown below in Figure 9-10.

Figure 9-10: Anticipated Roadway and Transit Impacts during Construction (Segment 2)



Due to construction activities, there are anticipated minor delays at intersections along Vodden Street in Segment 2. The Synchro intersection operational analysis determined the following:

- To accommodate projected traffic volumes, signal timing plans will need to be optimized at the intersection of Vodden Street / Centre Street, as identified in the traffic report.

There are no recommended detours within Segment 2.

Active Transportation

The sidewalk on the south side of Vodden Street (75 metres due east of Ken Whillans Drive) is expected to be closed to accommodate the V1-SHFT1 shaft compound construction staging area. Similarly, the eastbound bicycle lane on Vodden Street (75 metres due east of Ken Whillans Drive) is expected to be closed to accommodate two vehicle travel lanes. There is the potential to shift the vehicle travel lanes and increase

the cycle lane width on the north side of the road to accommodate a bi-directional cycle lane between Ken Whillans Drive and Centre Street; another potential option is to narrow the traffic lanes and increase the width of the existing buffer between the roadway and the current cycling facility, allowing this expanded buffer to be re-allocated for an eastbound cycle lane. However, the final arrangement for cycling lanes must be confirmed in detailed design.

There is an anticipated sidewalk closure at the OBR1-SHFT1A location, on the south side of Vodden Street at the OBR corridor. Pedestrians will be detoured to the north side of Vodden Street between Mill Street North and Pleasant View Avenue. As the distance between Mill Street North and Pleasant View Avenue is approximately 275 metres, a potential mid-block crossing west of the shaft location should be considered in detailed design.

At B3-SHFT1A, the McLaughlin Valley Trail will be closed where it connects to the pedestrian sidewalk on the south of Bovaird Drive; however, the sidewalk adjacent to Bovaird Drive will remain open and outside of the shaft compound area. Signage will be required along the trail to warn of the closure.

Public Transit

There are no anticipated impacts to public transit due to the shaft compound locations within Segment 2.

9.7.3 Segment 3: OBR from Bovaird Drive to Old School Road and Old School Road to east of Hurontario Street

Segment 3 includes the following shaft compounds: OBR2-SHFT1A, OBR2-SHFT2A, OBR2-SHFT3A, OBR2-SHFT4A, OBR2-SHFT5A, OBR2-SHFT6A, OBR2-SHFT10A, OS1-SHFT1A, and OS1-SHFT2[10]. The following shaft compounds are also part of Segment 3 but were excluded from the assessment as they were deemed to have no impact to the transportation network: OBR2-SHFT7A, OBR2-SHFT8A, OBR2-SHFT9A, and Provisional Shaft A.

Vehicle Traffic

There are several potential lane closures along Old School Road that are required to accommodate the shaft compound construction staging area and extend into the road right-of-way, including:

- Eastbound lane closures on Old School Road for shaft compound OBR2-SHFT10A and OS1-SHFT1A

10. There are two potential "preferred" locations for OS1-SHFT2. OS1-SHFT2A is east of Hurontario Street, and OS1-SHFT2D is west of Hurontario Street.

- Full eastbound roadway closure on Old School Road, east of Hurontario Street, for shaft compound OS1-SHFT2A[11], or closure of eastbound through/right lane and conversion of left-turn lane to a shared left-through-right-lane on Old School Road, west of Hurontario Street for shaft compound OS1-SHFT2D

At shaft compounds OBR2-SHFT10A and OS1-SHFT1A, single-lane, two-way traffic will be maintained by using signal control (i.e., for our model assumptions we considered that Portable Temporary Traffic Signal (PTTS)[12] will be used to stop traffic in one-direction and allow traffic to clear for the opposing direction). There may be an opportunity to temporarily convert the westbound shoulder into a travel lane to maintain two-way travel.

Because of the full eastbound roadway closure at shaft compound OS1-SHFT2A, all eastbound turning movements at the Old School Road / Hurontario Street intersection will be prohibited (i.e., receiving lanes on Old School Road east of Hurontario Street are closed). Due to this closure, eastbound traffic on King Street in the AM peak was identified as operating at capacity in 2027. Appropriate detour signage will be implemented well in advance of the Old School Road / Hurontario Street intersection to avoid unnecessarily long detours for motorists. Warning signs will be required to notify motorists of adjacent construction zones.

Alternatively, the implementation of shaft compound OS1-SHFT2D would require the closure of the eastbound through-/right-turn lane, and conversion of the auxiliary left-turn lane into a shared left-/through-/right-turn lane. Due to this lane reduction, eastbound traffic on King Street in the AM peak was identified as operating at capacity in 2027.

Increased truck traffic is expected on roads adjacent to shaft compound construction staging areas which may result in localized delays. For example, there are no required lane closures on Mayfield Road or Van Kirk Drive to access the shaft compound; however, increased construction truck traffic may result in localized congestion on local roadways. Depending on resulting congestion levels, truck restrictions may be imposed during peak hours to manage congestion.

As noted in Segment 1, the existing conditions were modelled and several major roadways are currently operating at capacity and will continue to operate at capacity during the simultaneous construction projects, including:

- Bovaird Drive (eastbound in the AM peak)
- Mayfield Road (eastbound in the AM peak, westbound in the PM peak)

11. There are two potential "preferred" locations for OS1-SHFT2. OBR1-SHFT2A is east of Hurontario Street, and OS1-SHFT2D is west of Hurontario Street.
12. Note that to use PTTS for long duration construction contracts and in the absence of a contractor on site a PHM-125 drawing must be prepared and approved.

- Hurontario Street (southbound in the AM and PM peak, northbound in the PM peak)
- Heart Lake Road (southbound in the AM peak, northbound in the PM peak)

Figure 9-11 shows the roadways within Segment 3 that are currently operating at capacity (e.g., Bovaird Drive, identified in orange) and roadways operating at capacity due to all assumed concurrent construction projects within the study area (identified in red) in the AM peak. Figure 9-12 shows the same information except for the PM peak. As shown in these two figures, within Segment 3, the following roadways were identified as operating at capacity in 2027 due to the simultaneous ongoing construction project:

- King Street / Regional Road 9 (eastbound in the AM peak)

Figure 9-11: AM Peak Road Network Capacity Impacts during Construction (Segment 3)

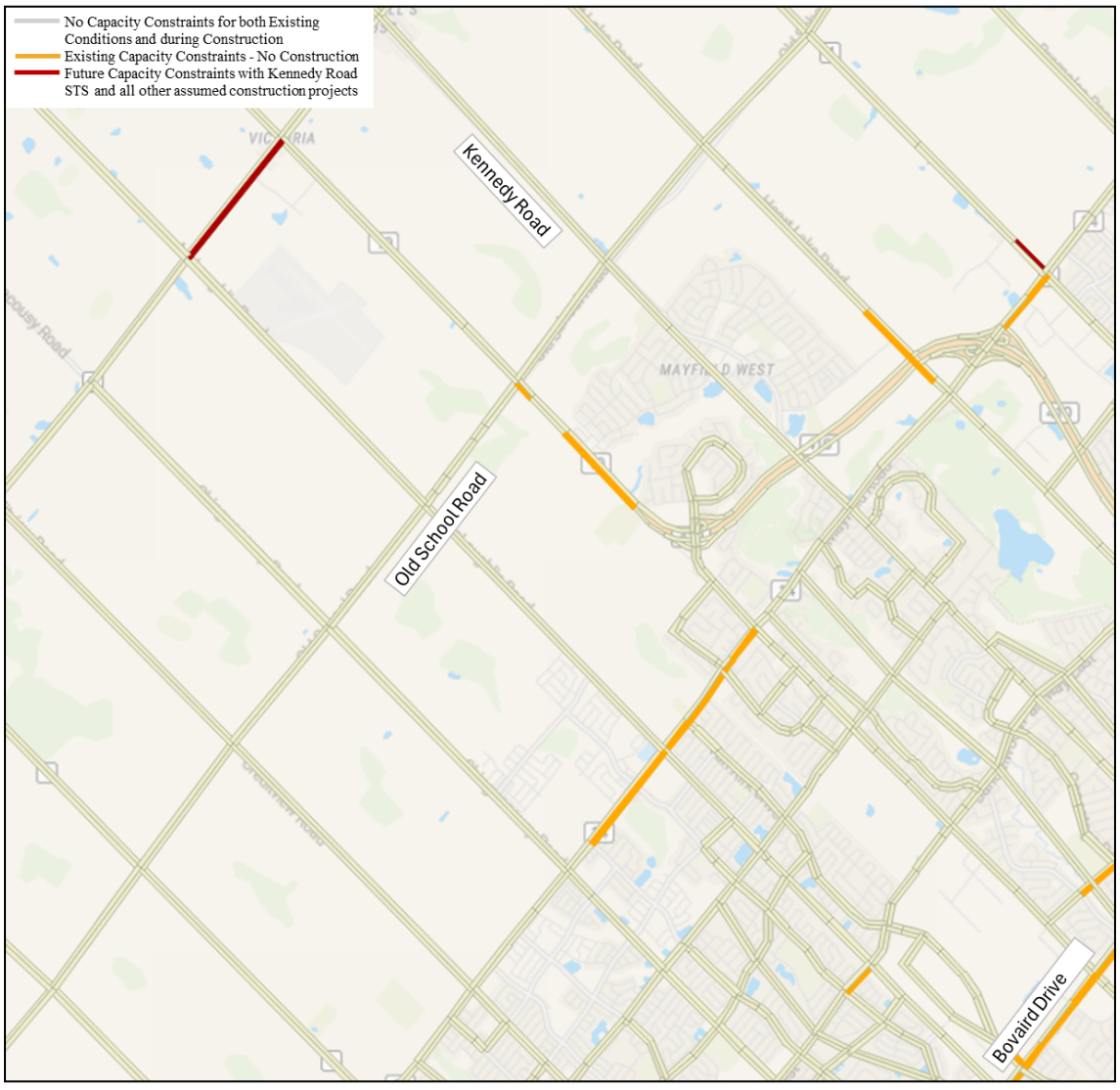
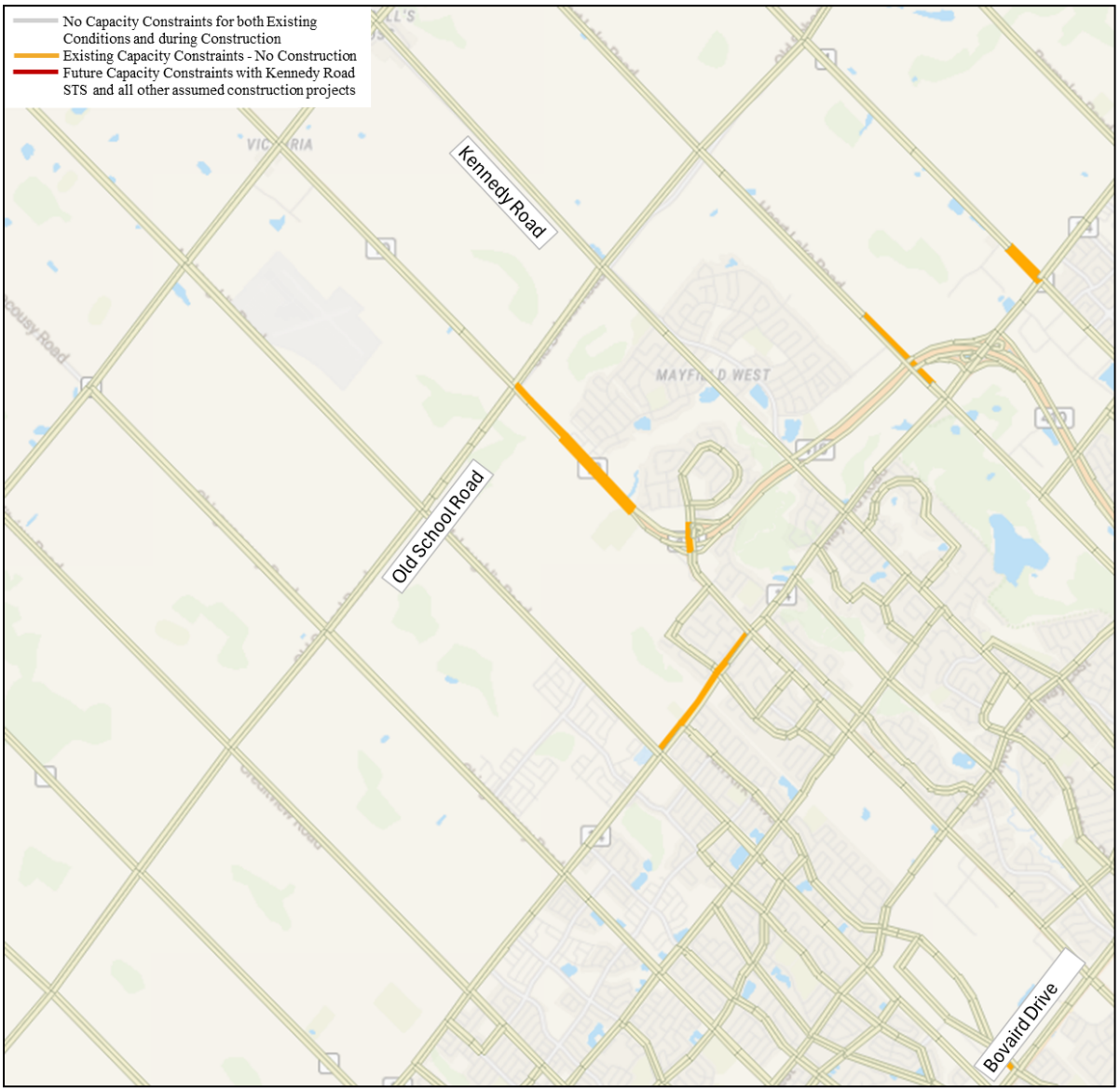
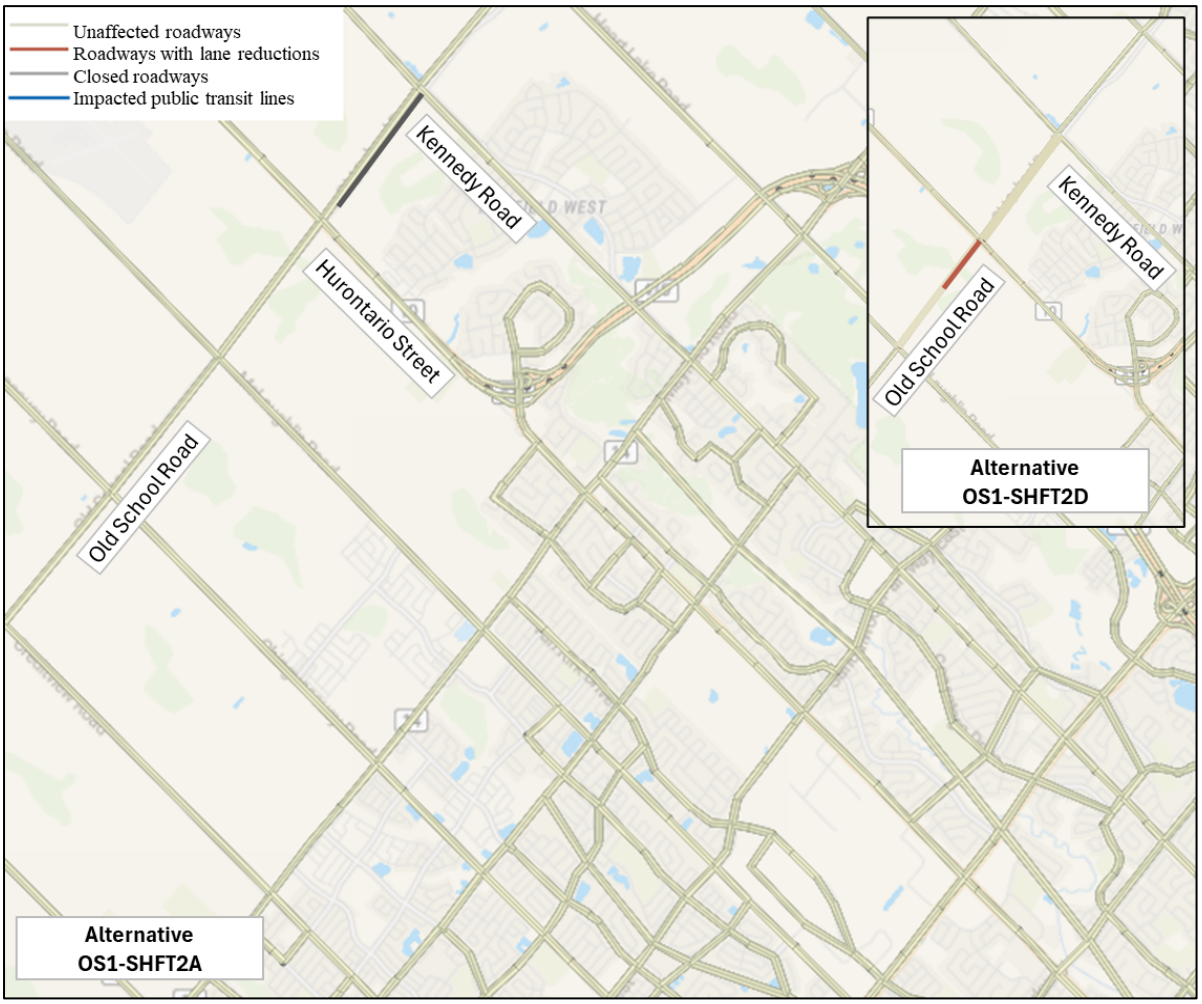


Figure 9-12: PM Peak Road Network Capacity Impacts during Construction (Segment 3)



The anticipated road closures, lane reductions and transit impacts, including assumed construction projects that will be underway concurrent with the Kennedy Road STS construction, are shown below in Figure 9-13.

Figure 9-13: Anticipated Roadway and Transit Impacts during Construction (Segment 3)



The identified lane closures are anticipated to contribute to moderate delays at intersections along Old School in Segment 3. Existing signal timing plans are expected to be able to accommodate projected traffic volumes at the Old School Road / Hurontario Street and Old School Road / Kennedy Road intersections.

If Alternative OS1-SHFT2A is carried forward as the preferred alternative, a detour will need to be implemented to accommodate the eastbound closure of Old School Road between Hurontario Street and Kennedy Road. Given the spacing between intersections (approximately 1.4 kilometres east/west and 2 kilometres north/south), appropriate detour signage must be implemented well in advance of the Old School Road / Hurontario Street intersection to avoid unnecessarily long detours for motorists.

Active Transportation

There is anticipated impact to active transportation users due to the shaft compound construction of Segment 3. There is a paved shoulder on both north and south sides of the roadway. OBR-SHFT 10, OS1-SHFT1, OS1-SHFT2A/OS1-SHFT2D will force a closure/relocation of the eastbound paved shoulder, resulting in active transportation facilities being detoured with regular traffic. Potentially these shaft compound areas could be organized to include a separated cycling facility to maintain the eastbound active transportation route on Old School Road.

Public Transit

At the Old School Road / Hurontario Street intersection, the northbound and southbound stops for GO Transit Bus Route 37 are located in the southeast and northwest quadrants, respectively. While not directly adjacent to any shaft compound, pedestrian connectivity to the bus stops may be restricted due to the construction staging area of shaft compound OS1-SHFT2D, located in the southwest quadrant of the intersection. There are no other anticipated public transit impacts in Segment 3.

9.8 Erosion and Sedimentation Impacts and Mitigation

Construction activities have the potential to cause erosion and sedimentation, which can adversely impact nearby watercourses, floodplains, and sensitive habitats. To address these risks, a comprehensive suite of erosion prevention and sediment control (ESC) measures will be implemented during the detailed design and construction phases of the project. These measures aim to minimize sediment transport and safeguard sensitive ecosystems.

Erosion and Sediment Control Measures

ESC measures will include the installation of sediment traps and catch-basin protection to prevent sediments from entering storm sewers. Sediment control fences will be placed along construction site boundaries, and exposed excavated materials will be covered to minimize erosion. Additional measures such as silt fences and silt socks will be installed as needed. Material storage in flood-prone areas will be avoided, and all ESC plans will align with TRCA's *Erosion and Sediment Control Guide for Urban Construction* (2019). Where construction works are in flood-prone areas, measures will be taken to flood-proof the work area and protocols for monitoring wet weather events and corresponding actions will be established. This would apply to the following proposed shaft compounds:

- V1 – SHFT 1A (Etobicoke Creek at Vodden Street),
- OBR1 – SHFT 2A (tributary to Fletchers Creek at Williams Parkway)

- B3 – SHFT 1A (Fletchers Creek at Bovaird Drive)
- OBR2 – SHFT 10A (headwater tributary to Etobicoke Creek at Old School Road and OBR)

Co-ordination with Regulatory Authorities

AECOM and Peel Region will consult with TRCA and CVC to finalize mitigation measures, permitting, and monitoring requirements. At the Detailed Design phase and as part of permit application packages, detailed design drawings, ESC plans, and restoration plans will be submitted for review, ensuring compliance with TRCA and CVC guidelines. Co-ordination with the Ministry of Environment, Conservation and Parks will also address SAR impacts, permitting requirements, and construction timing windows.

Emergency and Contingency Planning

A Response Plan will be developed to address sediment releases or spills, with an emergency spill kit maintained on-site.

Species at Risk and Habitat Protection

The Region will conduct natural environmental investigations, including vegetation and SAR assessments. A Tree Preservation, Replacement, and Comprehensive Offsetting Plan will be developed in line with CVC and TRCA guidelines. Restoration plans will address habitat loss, and tree inventories will guide site restoration efforts.

Monitoring and Reporting

Monitoring protocols will be established to assess sediment levels and the effectiveness of ESC measures. Regular inspections will ensure compliance, and restoration plans will be implemented to rehabilitate disturbed areas post-construction.

9.9 Excess Soil Management

In August 2025, a Contaminant Overview Study (COS) was completed for the project area to develop a preliminary determination of the likelihood that one or more contaminants have affected the project area. The findings of the COS indicated various on-site potentially contaminating activities (PCAs) have contributed to areas of potential environmental concern (APECs) within the project area, including fill of unknown quality, the presence of a rail line (OBR), and spills within portions of the project area. Off-site PCAs have also contributed to APECs within the project area including autobody and/or auto service garages, properties with storage tank records, dry cleaning operations, a transformer, other industrial properties, and various spills.

No O.Reg. 406/19 excess soil planning documents have been completed for the project area at this time, and therefore excess soil quality has not been determined. Required excess soil planning documents will be prepared as part of the Detailed Design phase

and include Excess Soil Management Strategy, Assessment of Past Uses (APUs), Sampling and Analysis Plans (SAPs), and Soil Characterization Reports (SCRs).

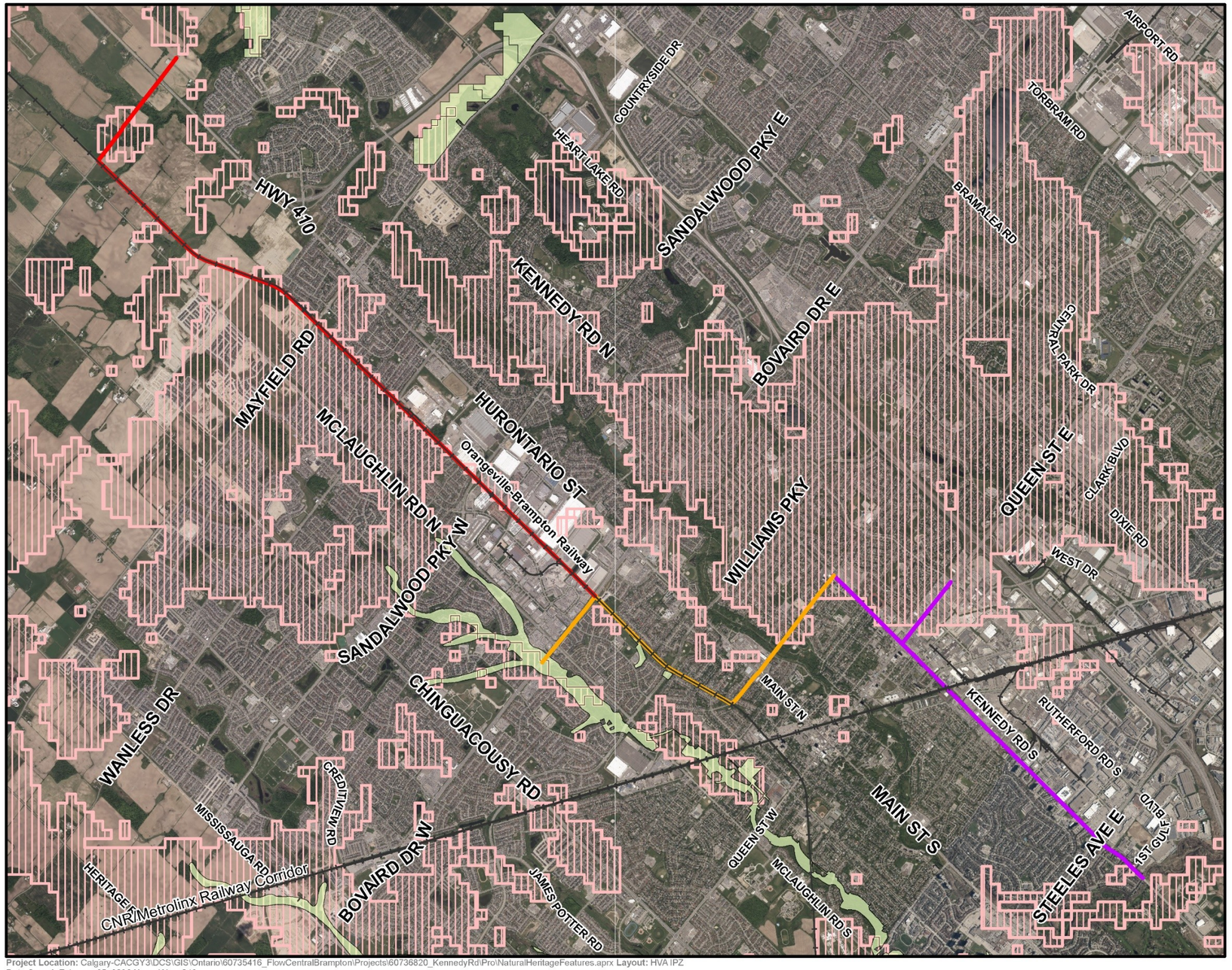
Analytical results obtained for the soil samples collected will be compared to the "Rules for Soil Management and Excess Soil Quality Standards" referenced in O.Reg. 406/19 (On-Site and Excess Soil Management), published by the Ontario Ministry of Environment, Conservation and Parks (MECP) and dated February 19, 2024 (The Soil Rules).

9.10 Source Water Protection

The source protection plan that includes the Study Area was updated in 2022 (CTC Source Protection Region, 2022), and includes policies that protect water sources. According to the source protection plan, the Region of Peel has 14 Wellhead Protection Areas (WHPAs), which are all located within Caledon and outside of the study area. The Region of Peel has two Intake Protection Zones (IPZs), including one IPZ at Lorne Park Water Treatment The source protection plan that includes the study area was updated in 2022 (CTC Source Protection Region, 2022) and includes policies that protect water sources. According to the source protection plan, the Region of Peel has 14 Wellhead Protection Areas (WHPAs), which are all located within Caledon and outside of the study area.

The Region of Peel has two Intake Protection Zones (IPZs), including one IPZ at Lorne Park Water Treatment Plant (WTP) and one IPZ at A.P. Kennedy WTP (CTC Source Protection Region, 2022). However, there are no IPZ's within the study area, as per MECP's Source Protection Information Atlas (MECP, 2022). One identified drinking water threat activity includes "the establishment, operation, or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage" (CTC Source Protection Region, 2022). Since the proposed Deep Trunk collects and transmits sewage, it is included under this drinking water threat. The project area is also upstream of an Event Based Area, as identified on MECP's Source Protection Information Atlas (MECP, 2022), however, it is several kilometres upstream and so impacts are expected to be negligible Potential risks to the impact zones include potential spills to Etobicoke Creek that could end up flowing downstream to the IPZs. This threat could occur during construction, operation, or if erosion at watercourses exposes the sewer. Additionally, according to MECP's Source Protection Information Atlas, there are Highly Vulnerable Aquifers (HVA) within the Study Area as shown in Figure 9-14. An HVA is an aquifer that is susceptible to contamination, either because it is located close to ground surface or the ground materials around the aquifer are highly permeable.

Figure 9-14: Preferred Route and Highly Vulnerable Aquifers (HVA)



Project Location: Calgary-CACGY3\DCS\GIS\Ontario\60735416_FlowCentralBrampton\Projects\60736820_KennedyRd\Pro\NaturalHeritageFeatures.aprx **Layout:** HVA IPZ
Date Saved: February 05, 2026 **User:** WangS12

To mitigate adverse impacts to the Event Based Area and the HVAs, it is recommended that the following mitigation measures are implemented:

- Locate site maintenance, vehicle washing, and refueling stations where contaminants are handled offsite and at least 30 metres away from any watercourses or wetlands
- Ensure a Spills Management Plan is onsite at all times
- Implement Erosion and Sediment Control (as outlined in Section 9.8)

For the open-cut section and shaft locations requiring dewatering, dewatering should be minimized where feasible to reduce any impact on HVAs. The proposed Deep Trunk sewer will also be sized and constructed according to typical standards and codes to mitigate the occurrence wastewater leakage into the creek.

The above will be expanded upon and captured in the Hydrogeological Impact Assessment Report (HIAR) as part of the detailed design phase.

During detailed design phase consultation with the Toronto Source Protection Area (SPA) and Credit Valley SPA will be undertaken to confirm applicable SPA policies and guidelines that will apply to the Study Area to ensure that proposed mitigation measures meet SPA requirements. Additional consultation might be required with the applicable municipality and/or MECP to request recommendations and policies on the several water wells that are located within the project Study Area.

9.11 Air Quality and Odour Considerations

9.11.1 Air Quality

Air quality considerations for the project were evaluated as part of the MCEA and are primarily associated with short-term construction activities with localized and temporary effects.

The Project is proposed to be constructed predominantly using trenchless methods (micro-tunnelling and/or tunnel boring machine), which significantly limit surface disturbance, excavation, and associated dust generation compared to open-cut construction. Surface works will be largely confined to shaft compounds and connection locations. Construction-related dust will be managed through standard best management practices, including dust suppression, covering of stockpiled materials, traffic and construction staging controls, and prompt site restoration, as identified in the Project's mitigation measures and evaluation matrix.

Potential air quality effects related to contaminated soils have been considered through existing studies in support of the project, including the Contaminant Overview Study, the Former Orangeville–Brampton Railway environmental site assessments, and

supporting geotechnical and contamination desktop investigations, which identified discrete areas of potential environmental concern. Appropriate soil handling, excess soil management in accordance with Ontario Regulation 406/19, and spill prevention and contingency measures are included as Project commitments.

During operation, the sanitary trunk sewer will function as a deep, enclosed gravity system, and no significant long-term air quality or odour impacts are anticipated. Any localized odour considerations at diversion chambers or drop/maintenance structures will be addressed through standard design measures as warranted.

Overall, air quality impacts are expected to be low in magnitude, localized, and temporary, with detailed implementation of mitigation measures to be confirmed during detailed design and construction in accordance with the ESR commitments, including MECP permits and approvals (e.g., ECA requirements).

The following further expands upon how odour control will be addressed during the detailed design phase.

9.11.2 Odour Control and Mitigation

Odour control is a critical design discipline for the project due to its length, depth, and multiple major drop structures, which increase the potential for odour generation. Figure 9-15 provides mapping of potential locations for air quality screening / emission release locations such as drop structures, connection points and diversion chambers along the preferred route.

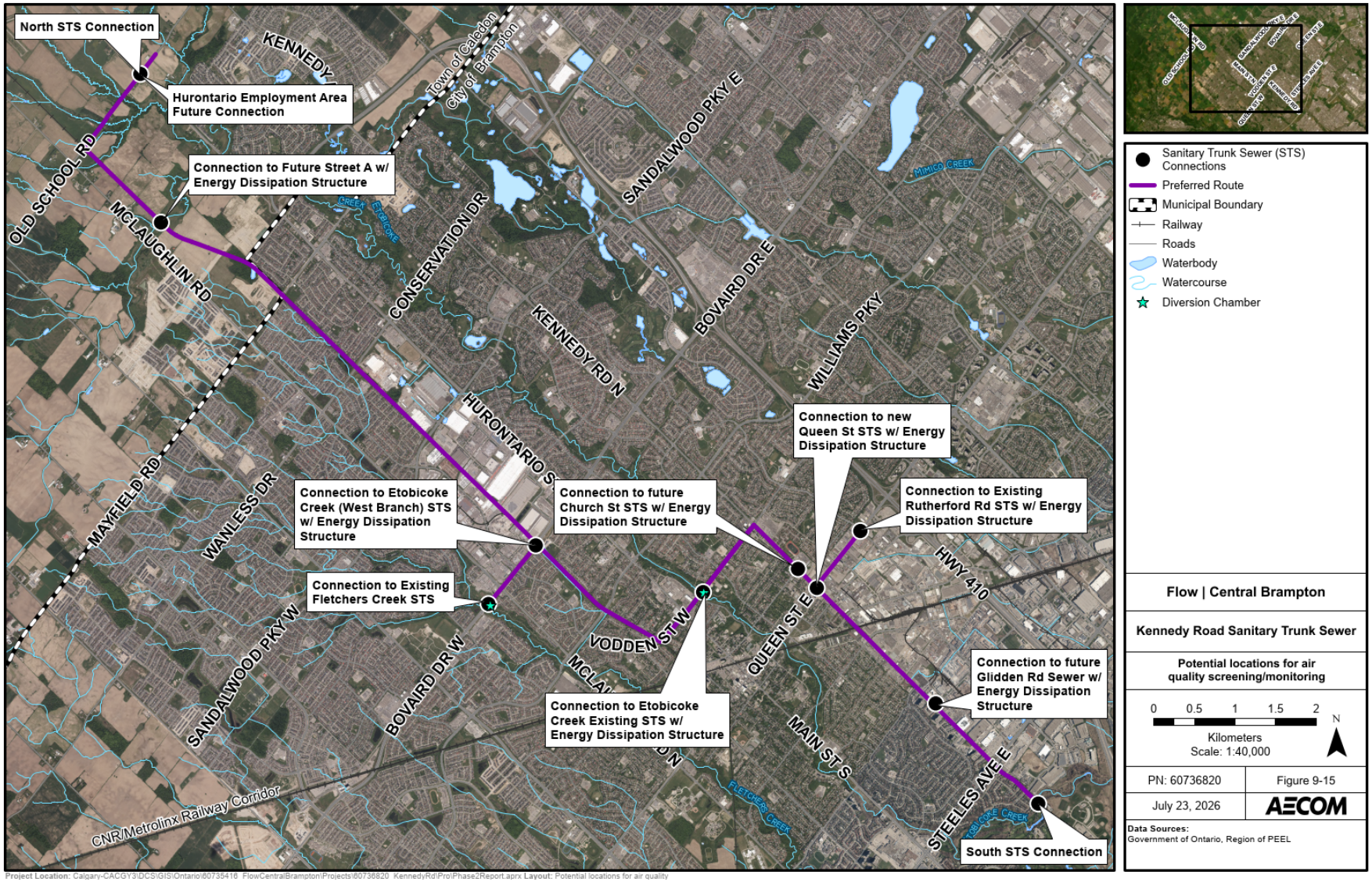
Design measures intending to reduce odour generation include:

- Limiting connections to existing sewer systems
- Minimizing the number of drop structures
- Maintain smoother (laminar) flow conditions
- Minimizing turbulence that could release H_2S and odorous gases.

To mitigate odour emissions during operation, the odour control system must be properly sized, configured, and to comply with the published air quality regulations. The detailed design will include the collection of key baseline data describing existing conditions.

- Airflow Characteristics: Airflow rate is a key parameter required to size the system to achieve the calculated extraction capacity to maintain the required negative pressure within the sewer headspace to prevent uncontrolled odour releases.

Figure 9-15: Potential Locations for Air Quality Screening along the Preferred Route



- Odour Compound Concentration: Quantification of hydrogen sulphide (H_2S), volatile organic compounds (VOCs), reduced sulphur compounds (RSCs), and odour units (OU) provides the basis for treatment technology selection and sizing. Continuous H2S monitoring, pressure, temperature, and air sampling will be implemented where possible and applicable to get the baseline information.
- Wastewater Quality Parameter: Sulphide, pH, temperature, dissolved oxygen, and related water chemistry influence odour generation potential and cross-validate air sampling results. A field liquid sampling should be performed where possible and applicable.

An odour control plan will be developed during detailed design. The plan will provide the description of the tasks required to define if an odour control system will be required, structures/facility location(s), odour treatment technology selection and performance, utilities requirements, as well as capital and operating costs. A key task on the evaluation of the odour control system requirements will be the process analysis and calculations based on:

- Background documentation review, including the design drawings for the STS
- Field sampling (vapour and liquid) program from the existing sanitary sewers that will be connected to the new STS
- Mathematical ventilation modelling to establish the air flow requirements
- Develop a process flow diagram to size the odour control system, if required.

9.11.3 Screening-Level Air Quality Assessment

A screening-level air quality assessment was undertaken to evaluate potential air quality effects associated with the construction and operation of the Kennedy Road STS. This assessment integrates findings from supporting environmental investigations with project design characteristics and standard municipal practices to evaluate potential emission sources, pathways, receptors, and mitigation measures.

Refer to Table 9-9 for the screening-level air quality summary evaluation, including mitigation measures.

The screening-level assessment presented above in Table 9-9 demonstrates that potential air quality effects have been evaluated through consideration of contaminant characteristics, system design, receptor exposure, and mitigation measures.

Table 9-9: Screening-Level Air Quality Assessment Summary Evaluation

Component	Details	Assessment / Rationale	Mitigation / Controls
Contaminants of Concern	The primary contaminants of concern include hydrogen sulphide (H_2S), Total Reduced Sulphur, commonly associated with wastewater systems, as well as general volatile organic compounds (VOCs). Supporting investigations completed as part of this study, including the Contaminant Overview Study (August 2025), Former Orangeville–Brampton Railway environmental site assessments, and supporting geotechnical investigations, identified petroleum hydrocarbons (PHCs), polycyclic aromatic hydrocarbons (PAHs), and metals in localized areas. Dust may also be generated during construction activities.	The identified contaminants, including PHCs, PAHs, and metals, are characterized by low volatility and do not readily partition into the vapour phase under typical environmental conditions. Supporting studies confirm that contamination is localized and does not represent a continuous or distributed source. As a result, these compounds do not provide a mechanism for sustained airborne emissions when managed in accordance with standard soil handling practices and Ontario Regulation 406/19. Wastewater-related odour compounds (e.g., H_2S) are confined within the sewer headspace; the proposed trunk sewer is a sealed, enclosed system installed at depth, which prevents continuous release to the atmosphere. Under normal operation, no sustained emission pathway exists for migration of these gases to ambient air.	Soil management in accordance with Ontario Regulation 406/19, dust suppression measures, controlled handling of excavated materials, and spill prevention and containment practices. Contract specifications will include a contingency plan to address odours and other potential air emissions will be developed during detailed design. A screening of sensitive receptors will be undertaken during detailed design to confirm any further assessment is warranted.
Receptors	Potential receptors include adjacent residential areas, commercial and institutional land uses, pedestrians, and construction workers along the preferred route. Sensitive receptors will be further confirmed and assessed in the detailed design phase.	Receptor exposure is constrained by the physical configuration of the project. The trunk sewer will be installed at significant depth below ground surface and constructed predominantly using trenchless methods, eliminating continuous surface disturbance along the alignment. There is no direct or continuous exposure pathway between the enclosed sewer system and receptors under normal operating conditions. During construction, exposure is limited to defined work zones (shaft compounds), which are temporary and spatially confined.	Standard construction controls including dust suppression, traffic and staging management, and site-specific mitigation. Localized odour control measures will be incorporated during detailed design where warranted. Potential odour release locations are illustrated on **Figure 9-15**. Potential odour impacts associated with these or other locations will be assessed during detailed design. Mitigation will include best management practices for minimizing offsite odour impacts all of which will be captured and implemented during the operations phase.
Existing Conditions	Ambient air quality within the study area reflects typical urban conditions dominated by traffic and surrounding land uses. According to the Air Quality Ontario website (www.airqualityontario.com), the nearest regional AQHI monitoring station is located at 109 McLaughlin Road South, about 2 to 10 kilometres away from the project's alignment (shortest 2 kilometres to Vodden Street and OBR intersection). The station provides a record for Ozone, Nitrogen Dioxide and PM2.5 and a summary for AQ Health Index (AQHI) ranging within "low risk" mark. The data will be used for the ambient air quality condition with the limitation to the project's overall location kilometers away from the station. There are no known sewer-related emission sources along the project alignment.	Existing conditions represent a stable baseline with no identifiable sewer-related emissions. This provides a direct reference point for evaluating future conditions, as the proposed project does not introduce continuous emission sources.	Monitor the records provided from the nearest AQHI monitoring station throughout design.

Component	Details	Assessment / Rationale	Mitigation / Controls
Future Conditions (Operation)	The project consists of a deep sanitary trunk sewer operating as a fully enclosed gravity system with limited surface access points such as maintenance holes and diversion chambers.	The system is designed as a sealed, enclosed conveyance network that eliminates continuous interaction between wastewater and the atmosphere. Wastewater remains fully contained, and hydraulic conditions do not support sustained turbulence or pressurized gas release. There is no physical mechanism within the system that would result in continuous or distributed air emissions. Potential emission pathways are restricted to discrete, engineered access structures, which represent localized and intermittent release points rather than continuous sources.	Standard municipal design practices, including provisions for venting and potential incorporation of odour control systems where warranted during detailed design.
Construction Effects	Temporary dust emissions and soil handling associated with shaft construction and localized excavation activities.	Construction-related effects are inherently temporary and confined to localized work areas. The use of trenchless construction methods significantly reduces excavation compared to open-cut construction, thereby minimizing dust generation and soil disturbance. There is no mechanism for prolonged or widespread emissions along the corridor.	Dust suppression (e.g., watering), covering or stabilizing exposed materials, traffic and staging controls, prompt restoration, and soil management practices.
Operational Effects (Odour / Air)	Potential odour release at maintenance holes and diversion structures, particularly under transient hydraulic or upset conditions.	Under normal operating conditions, the enclosed system design prevents continuous release of odorous gases to the atmosphere. Minor, short-duration emissions may occur at discrete access points; however, these are localized and intermittent. There is no mechanism for sustained or widespread air emissions along the alignment, and the system does not function as a continuous source of air emissions.	Standard design measures, including appropriate venting and provision for odour control systems where warranted, will be incorporated during detailed design. Routine inspection and maintenance will maintain system performance.
Odour Management Practices	Odour management is a standard design and operational consideration for municipal wastewater infrastructure.	Municipal trunk sewer systems are designed to limit odour generation and release through enclosed conveyance and controlled access points. These systems do not rely on open-air exposure and inherently restrict odour dispersion. Similar systems within the Region and across Ontario, designed in accordance with municipal and provincial standards, have not resulted in sustained odour complaints or measurable air quality impacts under normal operating conditions. This provides empirical evidence that such systems do not function as continuous sources of odour emissions.	Localized odour mitigation measures (e.g., venting strategies or odour control systems) will be evaluated and incorporated during detailed design where warranted based on site-specific conditions.
Overall Conclusion	N/A	Based on contaminant characteristics, supporting environmental investigations, system design, receptor considerations, and the absence of continuous emission pathways, the Project does not represent a source of sustained or widespread air emissions. Construction-related effects are temporary and localized, while operational conditions do not support mechanisms that would result in measurable degradation of ambient air quality.	Mitigation measures are embedded within the Environmental Study Report (ESR) and will be refined during detailed design and construction.

Supporting investigations, including the Contaminant Overview Study, environmental site assessments, and geotechnical investigations, identify that potential contaminants along the corridor; such as petroleum hydrocarbons, PAHs, and metals, are localized and characterized by low volatility, limiting their ability to generate vapour-phase emissions under typical environmental conditions. As such, these contaminants do not represent a mechanism for sustained airborne emissions when managed in accordance with standard construction and soil management practices.

From a system design perspective, the proposed sanitary trunk sewer will operate as a deep, enclosed gravity system, which essentially prevents continuous interaction between wastewater and the atmosphere. Wastewater remains fully contained within a sealed conveyance system, and there are no physical mechanisms that would support sustained or distributed emission pathways. Potential air emissions are therefore limited to discrete infrastructure elements, such as drop structures, maintenance holes (MH) and diversion chambers, which function as controlled and localized access points.

The design of the trunk sewer accounts for future system flows associated with projected population growth. While increased flows may influence internal wastewater conditions (e.g., odour generation potential), they do not alter the physical configuration of the system or introduce new air emission pathways. As the system remains enclosed with fixed and controlled access points, any potential emissions remain localized, intermittent, and confined to discrete locations, rather than continuous or widespread sources affecting ambient air quality.

Consistent with industry experience, similar deep sanitary trunk sewer systems within the Region and across Ontario, constructed and operated in accordance with municipal and provincial design standards, have not demonstrated sustained odour complaints or measurable air quality impacts under normal operating conditions. This provides practical support for the conclusion that such systems do not function as continuous sources of air emissions.

Overall, the evaluation confirms that potential air quality effects are governed by system design, contaminant characteristics, and controlled emission pathways, all of which act to prevent sustained impacts to ambient air quality.

Conclusion

Based on this screening-level assessment, which considers contaminant properties, supporting environmental investigations, system design, receptor exposure, and mitigation measures, the Kenned Road Sanitary trunk Sewer Project does not represent a source of sustained or widespread air emissions.

Impacts are anticipated to be:

- temporary and localized during construction; and
- negligible during operation, as the enclosed system design does not support continuous or distributed emission pathways.

These conclusions are consistent with both the project-specific evaluation and the demonstrated performance of similar municipal infrastructure systems.

The conclusions of this assessment will be further validated during detailed design, where system hydraulics, infrastructure configuration, and site-specific conditions will be confirmed. Detailed design will include consideration of odour generation potential, evaluation of airflow and ventilation conditions within the system, and assessment of any localized odour control requirements at access structures. Where warranted, appropriate design measures (e.g., venting strategies or localized odour control systems) will be incorporated to ensure continued protection of ambient air quality in accordance with municipal and provincial requirements.

9.12 Noise and Vibrations Impacts and Mitigation

Construction of the preferred sanitary sewer will result in temporary noise and vibration from typical equipment such as excavators, trucks, pumps, and compaction equipment. These effects will be short-term and limited to active work areas. A construction noise and vibration mitigation plan will be completed during detailed design, and measures will be refined as necessary.

Noise and vibration impacts will be managed through the following measures:

- Working within the City of Brampton and Town of Caledon noise by-laws.
- Complying with the MECP Environmental Noise Guideline – Stationary and Transportation Sources.
- Minimizing construction traffic on local residential streets.
- Positioning stationary equipment (e.g., pumps, generators) away from sensitive receptors where possible.
- Using quieter construction methods and properly maintained equipment.

With these measures in place, residual noise and vibration impacts are expected to be low, localized, and temporary, consistent with typical municipal utility construction.

10. Permitting Requirements

The following sub-sections provide a list of regulatory agencies (Federal, Provincial and Municipal) and other stakeholders from whom permits and approvals will be required for this project.

10.1 Federal Departments

10.1.1 Department of Fisheries and Oceans

10.1.1.1 Species at Risk

The Critical Habitat for Redside Dace (*Clinostomus elongatus*) includes the meander belt width, 30 metres of riparian vegetation within that belt, and an additional 30 metres of vegetated area extending outward from the meander belt (DFO 2024). The proposed open-cut construction is anticipated to occur within this regulated habitat (i.e., the meander belt and its associated 30 metre vegetated buffer). Consultation with Fisheries and Oceans Canada (DFO) under the Species at Risk Act will be necessary to determine if formal authorization is required, such as a Letter of Advice, Fisheries Act Authorization, or a Species at Risk Act permit.

10.1.1.2 Fisheries Act

No in-water work is proposed for this project; however, work is proposed within Critical Habitat for a federally regulated SAR (Redside Dace), therefore, consultation with DFO will be required to determine if a Letter of Advice or Fisheries Act Authorization will be required.

10.1.2 Canadian Energy Regulator Act – TransCanada Pipelines

Crossing of the existing TransCanada Pipelines Limited (TCPL) – affiliate of TC Energy Corporation - will require a written consent of the existing TC Energy pipeline and potential access through TC Energy pipeline right-of-way from Van Kirk Drive at OBR2-SHFT2A south of Sandalwood Parkway. Written consent may also be required if access through the existing pipeline right-of-way from Van Kirk Drive to OBR2-SHFT2A is technically feasible.

Written consent will be submitted through TCPL online application form with 60% and 90% detailed design drawings.

10.2 Provincial Departments

10.2.1 Ministry of Environment Conservation and Parks

10.2.1.1 Environmental Compliance Approval (ECA)

A MECP ECA Form 2 (sewage works) for wastewater will be required for all new sewer tunnels including connecting sewers and diversion chambers. This will be completed under Transfer of Review that gives authority to the Region to approve the project under the Municipal Consolidated Linear Infrastructure Environmental Compliance Approvals (CLI ECA), in addition to a separate Air ECA under Section 9 of the Environmental Protection Act (EPA).

10.2.1.2 Environmental Activity and Sector Registry (EASR)- Construction Dewatering

A *Decision Notice* was posted to the Environmental Registry of Ontario (ERO) on May 27th, 2025, in response to MECP's August 2023 proposal termed "Streamlining permissions for water takings for construction site dewatering activities and foundation drains" (No. 019-6853). Subsequent to this notice, on July 1st, 2025, O.Reg. 63/16 was amended through the enactment of O.Reg. 66/25 by MECP to (amongst other things) to remove the existing volumetric cap on daily water-takings for construction dewatering that may be filed upon MECP's EASR (i.e., 400,000 litres per day per dewatering location) through the revocation of Clause 7(5).

In response to this regulatory amendment, water-taking permitting for Project-related construction dewatering will be addressed, as/if required, through a filing on MECP's EASR following preparation of the HIAR, and prior to the outset of construction based on review and approval of required contractor submittals (e.g., dewatering and discharge plans).

10.2.1.3 Endangered Species Act (ESA)

In June 2025, the Province of Ontario enacted Bill 5, the *Protecting Ontario by Unleashing our Economy Act,* 2025, which introduced amendments to the *Endangered Species Act,* 2007 (ESA) and laid the groundwork for the forthcoming *Species Conservation Act* (SCA), 2025. Under the amended ESA, species are still listed as extirpated, endangered, threatened and special concern, prohibitions related to the killing and harming of endangered or threatened species and the damage or destruction of their habitat still apply. Amendments to the ESA included the scoping of habitat protections, modification of species protections (i.e., harassment of a Species at Risk [SAR] is no longer prohibited), streamlining of permits and permitting requirements and the continuation of registration activities under current registry system.

Regulated habitat for Redside Dace is located within the boundaries of Fletchers Creek where connection to an existing sanitary truck sewer connection is proposed. Proposed open-cut construction is expected to be in the regulated habitat of Redside Dace (i.e., vegetated area of the meander belt plus 30 metres). A meander belt analysis has been completed and confirmed the limits of the regulated habitat.

Authorizations under the amended ESA or the new forthcoming SCA are required for bat SAR, Red-headed Woodpecker or other SAR. Note that aquatic species (i.e., Redside Dace) and migratory bird species (i.e., Red-headed Woodpecker) listed as extirpated, endangered or threatened under the federal Species at Risk Act do not receive protection under the new SCA. If impacts cannot be avoided permits or authorizations under the federal *Species at Risk Act*, the *Fisheries Act* and the *Migratory Birds Convention Act* would be required.

10.2.2 Ministry of Citizenship and Multiculturalism (MCM)

As described in Section 9.2.4, a letter confirming an archaeological assessment report recommending no future archaeological concern has been entered into the Ontario Public Register of Archaeological Reports will be required from the MCM prior to construction of the proposed works.

10.2.3 Ministry of Transportation (MTO)

An Encroachment permit will be required for Old School Road crossing of Highway 10 (Hurontario Street). It should be noted that the design of the Old School Road trunk sewer, including Hurontario Street crossing is not part of the Kennedy Road Sanitary Trunk Sewer detailed design project (Flow Central Brampton). This segment will be designed at a later date by a different consultant under a separate Flow Program (Flow South Caledon).

10.2.4 Toronto and Region Conservation Authority (TRCA)

A permit is required under Ontario Regulation 41/24 for works within regulated areas as the proposed works are within the TRCA regulated limits. An erosion and sediment control plan for all areas within the TRCA regulation limit will be required as part of the TRCA permit application. In addition, TRCA requires a net ecological gain through the permitting process for any tree removals within the Etobicoke Creek corridor. Tree Inventory and Protection Plan should be submitted as part of detailed design identifying trees recommended for removal due to the proposed works. Lastly, the requirements for a future scour analysis by a qualified fluvial geomorphologist to confirm depth of watercourse scour may need to be determined as part of detailed design.

10.2.5 Credit Valley Conservation (CVC)

A permit is required under Ontario Regulation 41/24 for works within regulated areas as the proposed works are within the CVC regulated limits. Similarly, a Tree Inventory and Protection Plan should be submitted identifying trees recommended for removal due to the proposed works within the Fletcher's Creek corridor. Since the proposed sanitary trunk sewer will tie into the existing Fletcher's Creek trunk sewer upstream of the Bovaird Drive crossing, the requirements for a future scour analysis by a qualified fluvial geomorphologist to confirm depth of watercourse scour may need to be determined as part of detailed design due to the proximity to the crossing.

10.3 Transportation Organizations

10.3.1 Canadian National Rail/Metrolinx

Co-ordination will be required with Canadian National (CN) Rail for settlement monitoring and crossing agreement – work permit for Kennedy Road underpass of the CN Rail tracks. As the corridor is owned by the CN Rail, CN will also review preliminary plan and profile drawings of the sanitary sewer alignment and any conflicts will be addressed during the Preliminary and Detailed Design phases, including any conflicts with Metrolinx's infrastructure.

10.4 Municipal and Regional Approvals

10.4.1 City of Brampton, Town of Caledon, and Peel Region Approvals

- Realty: Co-ordination with the City of Brampton and Town of Caledon Realty departments will be required during Detailed Design stage for development of Consent to Enter (CTE) agreements to support field investigations and construction.
- Parks, Forestry and Recreation: A Tree Inventory and Arborist Report will be required during Detailed Design to include an inventory of trees within or near the road Right-of-Way (ROW) and recommendations regarding protection measures and preservation plan. Tree removals should be completed outside of the combined bird and bat active windows of April 1 to November 30. The requirements for vegetation removal and compensation will need to be confirmed under City of Brampton and Town of Caledon Official Plans and approved by City of Brampton's Parks and Forestry and Town of Caledon's Parks and Recreation.

- Road Occupancy Permit: Other permits such as Road Occupancy Permit will be required from the City of Brampton, Town Caledon and Peel Region during construction.
- Development Planning: Connection to future streets/access roads within new development areas will need to be co-ordinated with the Development Planning departments of Brampton and Caledon. Site Plan Approval may also be required for works within Duggan Park and Fletcher's Creek Trail south of Bovaird Drive.
- Sewer Discharge Permits / Agreements: Depending on the selected locations of discharge for construction dewatering effluent generated during Project construction, sewer discharge agreements / permits may be required from one or both of The Regional Municipality of Peel and/or City of Brampton. Relevant sewer use by-laws for the Project area include:
  - Regional Municipality of Peel Wastewater By-Law (#53-2010) for sanitary and storm sewer discharges; and/or,
  - City of Brampton Sewage By-Law (#90-75) for storm sewer discharges.

  Obtaining permits for the discharge of dewatering effluent will be the responsibility of the contractor(s) retained to construct the Project based on their selected dewatering means and methods.
- Noise By-law Exemption: Depending on the contractors' construction schedule and sequencing, there maybe a need for a noise bylaw exemption from the municipalities which would be applied for by the Contractor.

10.5 Utilities

For some sections of the alignment utilities will have to be relocated or protected to accommodate the new sanitary trunk sewer. These include the existing infrastructure owned by Alectra, Hydro One, TransCanada Energy, Enbridge Gas, Bell Canada, Rogers Cable, Telus, and Zayo Group (formerly MTS Allstream) in addition to wet utilities such as local sanitary and storm sewers and local watermains. Preliminary plan and profile drawings of the preferred alignment will be circulated to these utility companies and applicable municipal departments and any utility conflicts will be addressed during the Detailed Design phase.

10.6 Permits Summary and Next Steps

The following Table 10-1 summarizes the proposed sequence of required key tasks and milestones in order to capture permits and approvals.

Table 10-1: Summary of Permits and Associated Milestones

Item	Permit/Approval	Approval Authority	Description	Sequence / Key Milestone
1.	Letter from MCM confirming entry of the archaeological assessment report into the Ontario Public Register of Archaeological Reports	Ministry of Citizenship and Multiculturalism (MCM)	■ Obtain signed Indigenous monitor agreements for participation in fieldwork. ■ Complete Stage 2 AA field investigations for areas of archaeological concern as per ESR Stage 1 AA. ■ Submit Stage 2 AA to MCM for review. ■ Address MCM and Indigenous community comments; document MCM entry of report into the Register. ■ Follow similar process if Stage 3-4 AA triggered. Areas requiring additional field investigations can be fenced off and allow construction within areas of no archaeological concern.	■ 30% detailed design ■ Confirm construction footprint and archaeological requirements at 60% detailed design ■ MCM letter confirming entry of the archaeological assessment report into the Register is required before tendering.
2.	Request for Review (RfR) under the Federal Fisheries Act	Department of Fisheries and Oceans (DFO)	■ For works within the Fletchers Creek floodplain and potential impacts on Species at Risk (SAR) habitat (e.g., Redside Dace) submission of a Request for Review under the Federal Fisheries Act will be required.	■ Initiate RfR process with DFO based on 30% detailed design (get in the queue) ■ Submit RfR at 60% Detailed design ■ Confirm if approved through Letter of Advice or Fisheries Act Authorization
3.	Species at Risk Act Permit	DFO	■ Should there be in water work, a Species at Risk permit may be required.	■ Follow up with DFO at 60-90% detailed design to determine if a permit is required.
4.	Permit to work within Regulated Areas	TRCA	■ Pre-consultation meeting based on final 30% detailed design ■ 60% design submission for review ■ 90% design submission for review ■ 100% stamped engineering drawings to also include Erosion and Sediment Control Plans and Floodplain limits)	■ Final supporting studies required with application (Natural Environment Report, Environmental Management Plan, Fluvial Geomorphic Assessment, Geotechnical, Hydrogeological, Tree Inventory and Protection Plan, Landscape Plan, Stormwater Management Plan, HEC-RAS model, cut-fill balance, etc.)
5.	Permit to work within Regulated Areas	CVC	■ Pre-consultation meeting based on final 30% detailed design ■ 60% design submission for review ■ 90% design submission for review ■ 100% stamped engineering drawings to also include Erosion and Sediment Control Plans and Floodplain limits)	■ Final supporting studies required with application (Natural Environment Report, Environmental Management Plan, Fluvial Geomorphic Assessment, Geotechnical, Hydrogeological, Tree Inventory and Protection Plan, Landscape Plan, Stormwater Management Plan, HEC-RAS model, cut-fill balance, etc.)
6.	Species Conservation Act	MECP	■ Potential impacts to the Bat SAR habitat are anticipated with the removal of trees ■ Should tree removals occur outside the timing window, registration under the Act may be required.	■ Confirm if the proposed removal of potential habitat requires registration under O Reg 75/26
7.	Consolidated Linear Infrastructure ECA / Air ECA	MECP	■ Complete and submit ECAs based on finalized design	■ 100% stamped drawings
8.	Encroachment Permit	MTO	■ Permit is required for Old School Road crossing of Highway 10 (Hurontario Street)	■ 60% detailed design pre-submission ■ 90% detailed design final permit application submission
9.	CN Rail Crossing Agreement – Work Permit	Canadian National Railway (CN Rail)	■ Access to railway may be in conflict with planned shaft compound directly south of CN Rail. ■ CN Rail design review to flag any conflicts with Metrolinx infrastructure	■ 60% detailed design pre-submission ■ 90% detailed design final permit application submission

Item	Permit/Approval	Approval Authority	Description	Sequence / Key Milestone
10.	Compliance with Canadian Energy Regulator Act	TransCanada Pipelines Limited (TCPL) – affiliate of TC Energy Corporation	■ Obtain a written consent for crossing TC Energy pipeline and potential access through TC Energy pipeline right-of-way from Van Kirk Drive to OBR2-SHFT2A	■ Written consent will be submitted through TCPL online application form. Refer to Jan 20, 2026 MHBC PIC #3 response letter for requirements and conditions. ■ 60% detailed design pre-submission ■ 90% detailed design final permit application submission
11.	Cultural Heritage Assessment	City of Brampton & Town of Caledon	■ Complete and submit the Cultural Heritage Report (CHR): Existing Conditions and Preliminary Impact Assessment for approval. ■ Complete and submit the Cultural Heritage Evaluation Report (CHER) for the OBR for approval. ■ If the OBR is identified as having Cultural Heritage value or interest and continues to be directly adversely impacted, a Heritage Impact Assessment (HIA) will be completed and submitted for approval.	■ CHR will be completed during the EA Phase. ■ CHER will be completed during the Preliminary Design. ■ HIA, if required, will be completed during the 30-60% Design.
12.	Authorization under Land Use Program assessment	NAV Canada	■ For proximity to Brampton Caledon Airport and Pearson. Contact Land Use Office to assess construction impacts near airports and air navigation infrastructure to ensure safety.	■ 60% Detailed Design
13.	Tree Removal Permit	City of Brampton and Town of Caledon	■ Preparation of tree inventory, arborist report, tree protection plan and compensation plan.	■ 60% detailed design pre-submission ■ 90% detailed design final submission
14.	Site Plan Approval	City of Brampton	■ May be required for works within Duggan Park and Fletcher's Creek Trail south of Bovaird Drive (to be confirmed).	■ 60% detailed design pre-submission ■ 90% detailed design final submission
15.	Noise Bylaw Exemption	City of Brampton and Town of Caledon	■ Dependent on contractor construction sequencing and schedule ■ Contractor to apply, if required.	■ Post-tender award
16.	Road Occupancy Permit	Peel Region, City of Brampton and Town of Caledon	■ Contractor to apply	■ Post-tender award

11. Property Requirements

Twenty-five MTBM shafts plus two provisional shafts are required for the construction of the Sanitary Trunk Sewer. Where possible these are placed outside of property boundaries to limit property requirements and to position the pipe alignment outside property boundaries.

Permanent easements are required where the permanent structures, pipe alignment and/or manhole location encroaches on part of a property. Permanent easements should also capture space for future maintenance and operations. Temporary easements are required where staging or construction activities may be temporarily required on part of a property.

Preliminary proposed property taking drawings (not including road right of way) are included in Appendix M. Limits of temporary and permanents easements within public and private properties will be confirmed in discussion with affected landowners during the detailed design stage.

15 shafts (including the two provisional shafts) are required along the OBR for the construction of the Sanitary Trunk Sewer. These shafts are placed fully or mostly within the limits of the OBR as described below in Table 11-1.

Table 11-1: Shaft Compounds in the OBR Corridor

Shaft Number	Compound Area
OBR1-SHFT1	1,409 m^2
OBR1-SHFT2	4,285 m^2
Provisional shaft B	1,606 m^2
OBR1-SHFT3	2,300 m^2
OBR2-SHFT1	1,795 m^2
OBR2-SHFT2	1,572 m^2
OBR2-SHFT3	1,595 m^2
OBR2-SHFT4	1,982 m^2
OBR2-SHFT5	1,600 m^2
OBR2-SHFT6	1,930 m^2
OBR2-SHFT7	1,770 m^2
OBR2-SHFT8	1,600 m^2
OBR2-SHFT9	1,600 m^2
Provisional shaft A	1,587 m^2
OBR2-SHFT-10	2,710 m^2

12. Environmental Assessment and Detailed Design Commitments

Through the completion of the MCEA process the Region has made a number of commitments that will be tracked and fulfilled through the detailed design stage. This includes:

- Mitigation: implement all mitigation measures as described in Section 9 – Impact Assessment and Mitigation Measures.
- Permits and Approvals: fulfill all permitting and approval requirements as described in Section 10 – Permitting Requirements and ensure permit and approvals conditions are captured in the Issue for Tender package.
- Property Requirements: Negotiate and secure temporary and permanent easements as described in Section 11 – Property Requirements.
- Overlapping Projects: Continue to work collaboratively with the City of Brampton and Town of Caledon during detailed design to develop mitigation strategies and coordinate overlapping projects including their respective Rail to Trail project initiatives within the OBR Corridor.
- Natural Environment: Region to consult with TRCA, CVC, City and Town throughout detailed design phase to finalize location of shaft compounds, ensure supporting detailed investigations are completed to support application of mitigation measures, monitoring requirements, as well as permitting and approvals. Indigenous Nations and rights holders will continue to be engaged throughout the detailed design phase, with particular focus on project's environmental stewardship through additional environmental investigations planned during detailed design, enhanced mitigation and restoration commitments, and expanded environmental protection measures that will be carried forward as the project advances.
- Tree Inventory and Arborist Report: Complete a Tree Inventory at each shaft location with tree within shaft compound areas during the detailed design phase to gather detailed tree information in support of tree removals, tree protection plans, and site restoration works.
- Fluvial Geomorphology: Fluvial geomorphology team to continue to be involved during the detailed design phase to ensure there are no negative impacts related to infrastructure within meanderbelt or predicted 100-years scour depth of the Etobicoke Creek, including tributaries, and Fletcher's Creek. At this time, it is assumed there are no in-water works associated with the connections to the existing Etobicoke Creek and Fletcher's Creek STSs.

- Archaeology: Region to complete Stage 2 AA based on Stage 1 AA and address any recommendations or additional studies based on Stage 2 AA findings. As with other archaeological field investigations the Region will invite Indigenous communities the opportunity to participate in the field investigations and review reporting, where interest has been expressed.
- Cultural Heritage: Based on the preliminary assessment in the Cultural Heritage Report, CHERs were recommended to be completed during Preliminary Design for CHL 1, BHR 2, CHL 3, CHL 5, and CHL 7. Region to complete any additional investigations (e.g., HIA) as per CHER recommendations.
- Noise and Vibration: Region to complete a Construction Noise and Vibration Management Plan during detailed design.
- Air Quality and Odour: Air quality mitigation measures listed in Table 9-9 to be applied during detailed design and construction phases. In addition, an Odour Control Plan will be developed during detailed design to assess the need for odour mitigation measures associated with the project. The work will include a review of background documentation, field sampling of vapour and liquid conditions within existing sanitary sewers, and ventilation modelling to evaluate air flow requirements. Based on the findings, the study will determine whether an odour control system is required, identify potential facility locations, and evaluate appropriate treatment technologies and performance requirements, as needed.
- Erosion and Sediment Control: Develop an Erosion and Sediment Control Report including a comprehensive suite of ESC measures during detailed design phase and implement during construction. The ESC measures are to be compliant with TRCA and CVC guidelines.
- Excess Soil Management: Region to develop excess soil management strategies (e.g., assessment of APUs, SAPs, SCRs) during detailed design phase.
- Hydrogeological Investigations: Preparation of the Hydrogeological Impact Assessment Report (HIAR) as part of the detailed design phase and consultation with the Toronto SPA and Credit Valley SPA to request applicable Source Protection Area (SPA) policies and guidelines that may apply to the Study Area will ensure that proposed mitigation measures meet SPA requirements. Additional consultation might be required with the applicable municipality and/or MECP to request recommendations and policies on the several water wells that are located within the project Study Area.

- Geotechnical Investigations: Complete detailed geotechnical investigations programs and reporting to inform the detailed design and permitting process.
- Traffic Impacts: Update Traffic Impact Assessment Report and prepare detailed Traffic Management Plans during detailed design in coordination with the City, the Town and MTO. Project team will continue engagement with PepsiCo and GLS regarding impacts to their permitted LCV routes.

13. Conclusions and Recommendations

This Class EA covers the processes required to ensure that the proposed project works meets the requirements of the Environmental Assessment Act. The Class EA planning process has not identified any significant concerns that cannot be addressed by incorporating established mitigation measures during construction which will be further developed in the detailed design phase

The preferred solution and design concept as described in this ESR resolves the Problem and Opportunity Statement described in Section 3.6 and indicates moderate and predictable impacts which are addressed by recommended mitigation measures presented in Section 9.

Considering the above, it is recommended that:

- Following ESR filing and clearance, the preferred design concept proceed to detailed design including approvals.
- Mitigation measures identified in Section 9 be further be expanded upon during detailed design and implemented as part of construction.
- EA commitments identified in Section 12 be addressed during the detailed design phase and be monitored for fulfillment.

In summary, the detailed design process will continue building upon the EA commitments (Section 12) and preliminary design which has been completed in parallel with the Class EA planning process.

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