

New Track and Facilities Transit Project Assessment Process

Final Environmental Project Report – Chapter 2

23-Nov-2020

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Authorization

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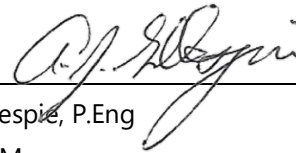
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2 Project Scope

As part of the GO Expansion Program, Metrolinx has identified various infrastructure requirements to achieve desired service level targets across the network. The New Tracks and Facilities Project is a component of the broader Metrolinx GO Expansion Program. Metrolinx has developed an Infrastructure Configuration State (ICS) based on modelling for each TSS (Train Service Scenario) which outlines the infrastructure necessary to deliver GO train service for GO Expansion. ICS is generally driven by peak hour and peak period demand.

Specifically, the scope of the New Track & Facilities Project includes various types of proposed infrastructure along the Lakeshore West, Kitchener, Barrie, Stouffville, Lakeshore East, Richmond Hill rail corridors that will enable Metrolinx to deliver targeted service levels.

The scope of the infrastructure proposed as part of the New Track and Facilities TPAP (the Project) is summarized Table 2-1.

TABLE 2-1 SUMMARY OF PROPOSED INFRASTRUCTURE: NEW TRACK AND FACILITIES PROJECT

Rail Corridor	Approximate Kilometers of New Track/Track Upgrades ¹	Number of New Switches	New GO Station Platforms	New Layover/ Storage Facilities	Bridge Expansions/ Modifications	Electrification ²
Lakeshore West	6.14	61	None	Walkers Line Layover Facility	No	No
Kitchener	7.44	23	None	None	No	No
Barrie	12.41	33	None	None	No	No
Stouffville	2.13	11	- Mount Joy GO Station - Unionville GO Station	Unionville Storage Yard	No	No
Lakeshore East	5.67 ³	23	Oshawa GO Station	None	Yes (Expansion of Thickson Rd Bridge)	No
Richmond Hill	4.29	3	None	Don Valley Layover Facility (Don Branch)	Yes, to accommodate Electrification	Yes – up to Mile 4.4. on Bala Subdivision

2.1 Overview of Project Components

An overview of the Project description is summarized in the following sections, organized by infrastructure type/project component.

¹ Includes new track proposed within layover/storage yard facilities.

² For further information regarding previous Electrification TPAPs, please refer to the GO Rail Network Electrification EPR, 2017 (<http://www.metrolinx.com/en/electrification/electric.aspx>).

³ Includes proposed retaining walls in select locations.

2.1.1 Track Infrastructure (Various Rail Corridors)

2.1.1.1 New Tracks/Track Upgrades

New tracks, upgrades to existing tracks, or track re-alignments are required on various Metrolinx rail corridors as part of achieving targeted GO Expansion service levels. The locations/extent of the proposed track works are outlined in Table 2-2 and shown in Figure 2-1. Detailed mapping of proposed track work has also been presented in **Appendix A1**.

2.1.2 Retaining Walls

The conceptual design that forms the basis for the New Track and Facilities TPAP includes retaining walls within the Lakeshore East Rail Corridor, as well as at the site of the proposed Don Valley Layover. Proposed retaining walls along the Lakeshore East Rail Corridor are required to reduce property encroachment, while the proposed retaining walls at the Don Valley Layover site are required to configure the site in a way that minimizes the amount of needed fill within the Don River floodplain. It should be noted that the locations and types of retaining walls will need to be further reviewed during detailed design. The following retaining walls are proposed within the New Track and Facilities TPAP (please refer to **Appendix A1** and **Appendix A2** for detailed mapping of these features):

- Track Segment LSE-2: Mile 10.10 to Mile 10.70
 - Retaining wall at Thickson Road
- Track Segment LSE-3: Mile 10.70 to Mile 11.20
 - Retaining wall at Oshawa GO Station
- Track Segment LSE-4: Mile 11.20 to Mile 11.70
 - Retaining wall at Oshawa GO Station
- Track Segment RH-3: Mile 2.50 to Mile 3.10
 - Retaining wall at Don Valley Layover
- Track Segment RH-4: Mile 3.10 to Mile 3.60
 - Retaining walls at Don Valley Layover
- Track Segment RH-5: Mile 3.60 to Mile 4.10
 - Retaining wall at Don Valley Layover

2.1.3 New Switches

A number of new switches are required within the existing track beds along a number of GO rail corridors to easily maneuver trains from one track to another. The locations of the proposed switches are illustrated on the mapping included in **Appendix A3**. Since the proposed new switches are located within the existing Metrolinx rail corridor ROW and will be constructed at the existing grade, there are no anticipated environmental impacts associated with new switches and therefore discussion of these components has been generally omitted from this report⁴.

2.1.4 New GO Station Platforms

The following new platforms at existing GO Stations are proposed as follows and as outlined in Table 2-2 and shown in Figure 2-1:

- Mount Joy GO Station (Stouffville Rail Corridor)

⁴ The Noise and Vibration Impact Assessment Report contained in Appendix M1 and M2 do consider new switches.

- Oshawa GO Station (Lakeshore East Rail Corridor)
- Unionville GO Station (Stouffville Rail Corridor)

It is assumed that any ancillary GO Station infrastructure has prior EA approval; therefore, the focus of the impact assessment studies for the New Track and Facilities TPAP is on the proposed physical footprint/location of the new platforms only. Additional study may be required during the detailed design stage to review and confirm potential environmental impacts of new station platforms, as well as ancillary components such as drainage, pedestrian access, tunnels (if required), etc.

2.1.5 New Layover Facilities and Storage Yard Facility

Two (2) new layover facilities and one (1) new storage yard facility are proposed as follows (also see Table 2-2 and Figure 2-1).

- Walkers Line Layover Facility – Lakeshore West Corridor
- Unionville Storage Yard – Stouffville Corridor
- Don Valley Layover Facility – Richmond Hill Corridor

2.1.6 Thickson Road Bridge Expansion (Lakeshore East Corridor)

The existing overhead rail structure at Thickson Road South, in the Town of Whitby, is to be widened to accommodate a new third track extending from the Whitby Maintenance Facility to Oshawa GO Station. Refer to Figure 2-1 and **Appendix A1** for mapping of this location.

2.1.7 Electrification – Portion of the Richmond Hill Corridor

The Richmond Hill corridor is proposed to be electrified within the City of Toronto, along the Bala subdivision and within Metrolinx's rail right of way from the eastern limit of the Union Station Rail Corridor to approximately Mile 4.4, in the vicinity of Pottery Road. Please refer to **Appendix A1** for the proposed electrification area (i.e. Overhead Contact System Infrastructure), corresponding to the proposed limits of electrification within this TPAP.

2.1.7.1 Overhead Contact System (OCS)

The OCS is a fundamental component of the traction power distribution system necessary for electrification and generally includes the following infrastructure components:

- OCS pole foundations;
- Portal/cantilever poles; and
- Contact, autotransformer, and feeder wires.

2.1.7.2 Grounding and Bonding

To ensure safe touch-and-step potential is in accordance with permissible limits, a grounding and bonding system will be implemented as part of the Project.

Grounding and bonding systems serve two primary functions:

- Minimize touch voltage, step voltage and ground return currents caused by the electrified system to provide for the safety of passengers, operating personnel and other wayside public, and to provide protection from the risk of electrical shock.
- Provide the means to carry electric currents into the earth under normal and fault conditions without exceeding operating and equipment limits, or adversely affecting continuity of service.

2.1.7.3 Bridge Modifications

The following bridge/rail overpass⁵ modifications may be required to accommodate electrification along the Richmond Hill corridor:

- **OCS Attachments/Support Structures:** There must be sufficient clearance between the messenger wire/catenary and the lowest part of the bridge structure to run OCS wires under overhead bridges without attachments. Where sufficient clearance does not exist, attachments (e.g., tunnel arms) on the structure are required to support the OCS. In addition, for rail overpass structures, OCS support structures (i.e., portals/cantilevers) may be required on the structure to support the OCS system.
- **Flash Plates:** In the case of concrete bridges, if the vertical clearance between OCS conductors and concrete overpasses is less than 1 m, protection panels (flash plates) will be installed above the OCS, attached to the underside of the bridge and interconnected to the static wire. Flash plates are metallic plates that are grounded. For steel overpasses, the steel girders will be interconnected and bonded to the static wire.
- **Modifications to Achieve Minimum Clearance:** Options include raising or replacing the overhead bridge structure and/or, lowering the tracks to achieve minimum vertical clearance requirements.
- **Bridge Protection Barriers:** The purpose of a bridge protection barrier is to protect pedestrians and infrastructure users within the public right-of-way from direct contact with adjacent live parts of the OCS. In addition, these barriers protect against damage to the OCS by providing an obstacle to debris that may be thrown onto the railway from overhead.
- **Grounding and Bonding:** As stated above, the purpose of grounding and bonding is to prevent damage to the bridge structures from flashovers, and to prevent step and touch potential from exceeding permissible limits as defined in the applicable standards.

2.2 Study Area

A preliminary (conservative) Study Area was previously established for purpose of baseline conditions data as part of the TPAP. Based on the conceptual design information available at the time of preparing this report, the Study Area for the impact assessment phase was refined for purposes of assessing potential effects to include:

- Locations within the existing Metrolinx rail corridor ROWs where new or upgraded tracks are proposed;
- Locations where property acquisition/easement may be required adjacent to Metrolinx rail corridor ROW for the installation of new/upgraded/reconfigured track infrastructure;
- Physical footprint areas associated with proposed layover facilities:
 - Proposed Walkers Line Layover Facility, including ancillary works (along the Lakeshore West Corridor)
 - Proposed Unionville Storage Yard Facility, including ancillary works (along the Stouffville Corridor)
 - Proposed Don Valley Layover Facility, including ancillary works (along the Bala subdivision, adjacent to the Richmond Hill Corridor)

⁵ Overhead bridges (i.e., bridge structure carrying roadway over the rail corridor) and rail overpass bridges (i.e., structures carrying GO rail corridors over roadways, pedestrian tunnels, or waterways).

- Areas that are anticipated to be required to accommodate New GO Station Platforms at the following GO Stations:
 - Oshawa GO Station
 - Mount Joy GO Station
 - Unionville GO Station
- Preliminary footprint/impact area associated with Thickson Road South Bridge Expansion; and
- The Richmond Hill Rail Corridor (from the eastern limits of the Union Station Rail Corridor to approximately Pottery Road, in the City of Toronto) plus the associated OCS/Vegetation Clearing Zone.

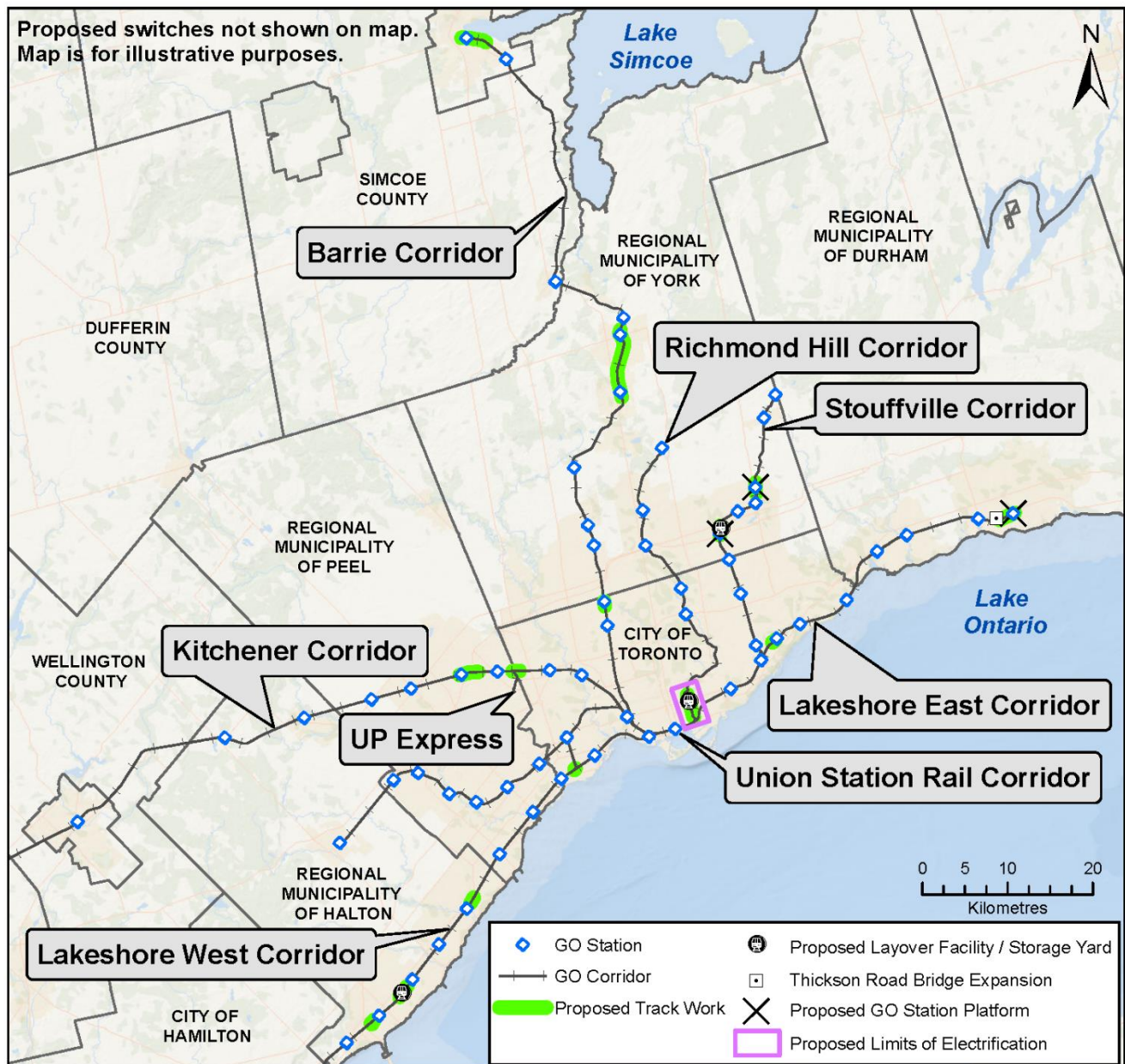


FIGURE 2-1 NEW TRACK & FACILITIES TPAP STUDY AREA

2.2.1 Study Area Segments

The Study Area has been further organized into rail corridor segments as outlined in Table 2-2 for the purposes of consistent documentation across all disciplines.

It should be noted that the starting point of each corridor map originates at the Union Station Rail Corridor and continues out to the furthest point of the corridor, with the exception of the Don Branch Subdivision along the Richmond Hill Corridor, the Uxbridge Subdivision along the Stouffville Corridor, and the Kingston Subdivision along the Lakeshore East Corridor.

Figure 2-2, Figure 2-4, Figure 2-5, Figure 2-6, and Figure 2-7 depict the Study Area at the rail corridor-level. Mapping at a more detailed scale is contained in **Appendix A1** and **Appendix A2**.

TABLE 2-2 NEW TRACK & FACILITIES TPAP PROPOSED INFRASTRUCTURE, STUDY AREA SEGMENTS AND KEY MAP FIGURE REFERENCES

New Track & Facilities TPAP Study Area Segments		Proposed Infrastructure	Key Map Figure Reference
Lakeshore West Corridor			
Segment LSW-1	Mile 8.10 to Mile 8.60	Track upgrade Mile 2.45 to 2.60 (Canpa subdivision)	Figure 2-2
Segment LSW-2	Mile 20.20 to Mile 20.70	Track upgrade from Mile 20.44 to 20.80 Track upgrade from Mile 20.58 to 20.88	
Segment LSW-3	Mile 20.70 to Mile 21.20	Track upgrade from Mile 20.44 to 20.80 Track upgrade from Mile 20.58 to 20.88	
Segment LSW-4	Mile 28.50 to Mile 29.00	New Walkers Line Layover from Mile 28.65 to 29.48	
Segment LSW-5	Mile 29.00 to Mile 29.50	New Walkers Line Layover from Mile 28.65 to 29.48	
Kitchener Corridor			
Segment KT-1	Mile 12.90 to Mile 13.40	Track upgrade from Mile 13.19 to Mile 13.69 Track upgrade from Mile 13.19 to Mile 13.64 Track upgrade from Mile 13.35 to Mile 13.70	Figure 2-3
Segment KT-2	Mile 13.40 to Mile 13.90	Track upgrade from Mile 13.19 to Mile 13.69 Track upgrade from Mile 13.19 to Mile 13.64 Track upgrade from Mile 13.35 to Mile 13.70	
Segment KT-3	Mile 16.10 to Mile 16.60	Track upgrade from Mile 16.20 to Mile 16.39 Track upgrade from Mile 11.54 to Mile 16.46 Track upgrade from Mile 11.56 to Mile 16.46 New track from Mile 16.50 to 11.11	
Segment KT-4	Mile 16.60 to Mile 11.20 - (Weston/Halton Subdivision)	Track upgrade from Mile 11.54 to Mile 16.46 Track upgrade from Mile 11.56 to Mile 16.46 New track northside of Mile 16.50 to 11.11	
Segment KT-5	Mile 11.20 to Mile 11.80	New track from Mile 11.39 to Mile 11.75	
Barrie Corridor			
Segment BR-1	Mile 12.10 to Mile 12.60	New track from Mile 12.19 to 12.53.	Figure 2-4
Segment BR-2	Mile 29.50 to Mile 30.00	Track upgrade from Mile 29.50 to 29.60 New track from Mile 29.54 to 34.62 Track upgrade from Mile 29.96 to 30.29	

New Track & Facilities TPAP Study Area Segments		Proposed Infrastructure	Key Map Figure Reference
Segment BR-3	Mile 30.00 to Mile 30.50	New track from Mile 29.54 to 34.62 Track upgrade from Mile 29.96 to 30.29	
Segment BR-4	Mile 30.50 to Mile 31.00.	New track from Mile 29.54 to 34.62	
Segment BR-5	Mile 31.00 to Mile 31.50.	New track from Mile 29.54 to 34.62	
Segment BR-6	Mile 31.50 to Mile 32.00.	New track from Mile 29.54 to 34.62	
Segment BR-7	Mile 31.90 to Mile 32.50.	New track from Mile 29.54 to 34.62	
Segment BR-8	Mile 32.50 to Mile 32.90	New track from Mile 29.54 to 34.62	
Segment BR-9	Mile 32.90 to Mile 33.50	New track from Mile 29.54 to 34.62	
Segment BR-10	Mile 33.40 to Mile 34.00	New track from Mile 29.54 to 34.62	
Segment BR-11	Mile 33.90 to Mile 34.50	New track from Mile 29.54 to 34.62	
Segment BR-12	Mile 34.40 to Mile 34.90	New track from Mile 29.54 to 34.62	
Segment BR-13	Mile 61.30 to Mile 61.80	New track from Mile 61.40 to 63.40	
Segment BR-14	Mile 61.80 to Mile 62.30	New track from Mile 61.40 to 63.40	
Segment BR-15	Mile 62.30 to Mile 62.80	New track from Mile 61.40 to 63.40	
Segment BR-16	Mile 62.80 to Mile 63.40	New track from Mile 61.40 to 63.40	
Stouffville Corridor			
Segment ST-1	Mile 51.00 to Mile 50.60	Unionville equipment storage yard from Mile 50.70 to 50.31 New Platform at Unionville GO Station New track eastside of new platform from Mile 51.00 to 50.73 Track upgrade from Mile 52.00 to 51.01	Figure 2-5
Segment ST-2	Mile 50.60 to Mile 50.00	Unionville Storage Yard from Mile 50.70 to 50.31	
Segment ST-3	Mile 46.30 to Mile 45.80	New Platform at Mount Joy GO Station New passing track for new platform from Mile 46.35 to 45.42	
Segment ST-4	Mile 45.80 to Mile 45.30	New Platform at Mount Joy GO Station New passing track for new platform from Mile 46.35 to 45.42	
Lakeshore East Corridor			
Segment LSE-1	Mile 323.90 to Mile 323.40 (Kingston Subdivision)	New storage/reversal pocket track northside of Mile 323.36 to Mile 323.76	Figure 2-6
Segment LSE-2	Mile 10.10 to Mile 10.70	New third track from Mile 10.44 to Mile 11.76 Thickson Road Bridge expansion north side of Mile 10.67 Retaining Wall at Thickson Road	
Segment LSE-3	Mile 10.70 to Mile 11.20	New track northside of new island platform from Mile 11.56 to Mile 11.74 New third track from Mile 10.44 to Mile 11.76 Retaining Wall at Oshawa GO Station	

New Track & Facilities TPAP Study Area Segments		Proposed Infrastructure	Key Map Figure Reference
Segment LSE-4	Mile 11.20 to Mile 11.70	New Platform at Oshawa GO Station Retaining Wall at Oshawa GO Station New track northside of new platform from Mile 11.56 to Mile 11.74 New third track from Mile 10.44 to Mile 11.76	
Richmond Hill Corridor			
Segment RH-1	Mile 1.60 to Mile 2.15	Electrification of the rail corridor (along the Bala subdivision) Track upgrade from Mile 1.90 to 2.86	Figure 2-7
Segment RH-2	Mile 2.15 to Mile 2.50	Electrification of the rail corridor (along the Bala subdivision) Track upgrade from Mile 1.90 to 2.86 Track upgrade from Mile 2.37 to 2.86	
Segment RH-3	Mile 2.50 to Mile 3.10	Electrification of the rail corridor (along the Bala subdivision) Track upgrade from Mile 1.90 to 2.86 Track upgrade from Mile 2.37 to 2.86 Track upgrade to Don Valley Layover from Mile 208.60 to Mile 209.50 (along Don Branch) Don Valley Layover (non-electrified) from Mile 209.00 to 207.93 (along the Don Branch) Retaining Wall at Don Valley Layover	
Segment RH-4	Mile 3.10 to Mile 3.60	Electrification of the rail corridor (along the Bala subdivision) Don Valley Layover (non-electrified) from Mile 209.00 to 207.93 (along the Don Branch) Retaining Walls at Don Valley Layover	
Segment RH-5	Mile 3.60 to Mile 4.10	Electrification of the rail corridor (along the Bala subdivision) Don Valley Layover (non-electrified) from Mile 209.00 to 207.93 (along the Don Branch) Retaining Wall at Don Valley Layover	
Segment RH-6	Mile 4.10 to Mile 4.65	Electrification of the rail corridor (along the Bala subdivision)	

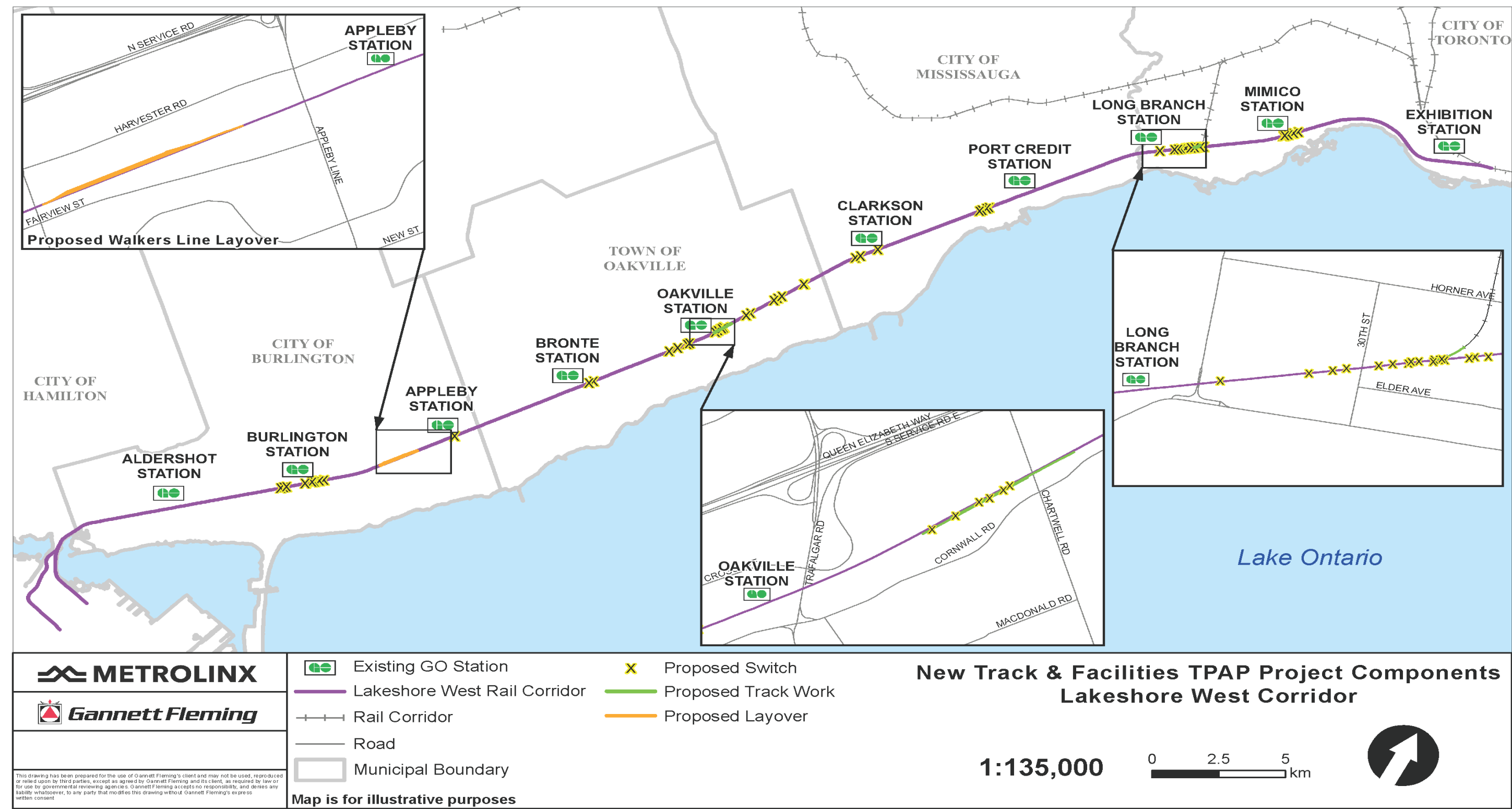


FIGURE 2-2 PROPOSED INFRASTRUCTURE - LAKESHORE WEST CORRIDOR

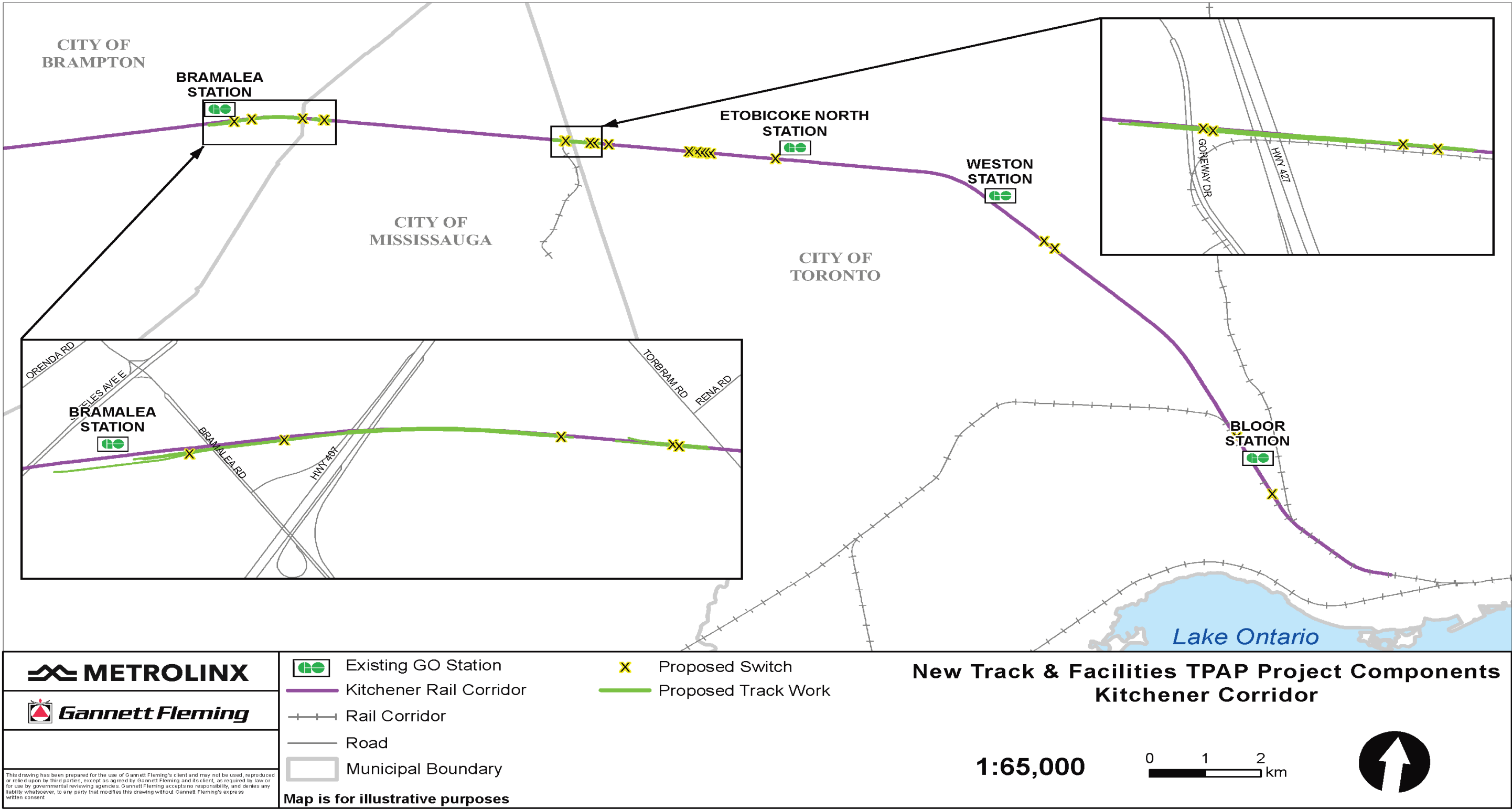


FIGURE 2-3 PROPOSED INFRASTRUCTURE - KITCHENER CORRIDOR

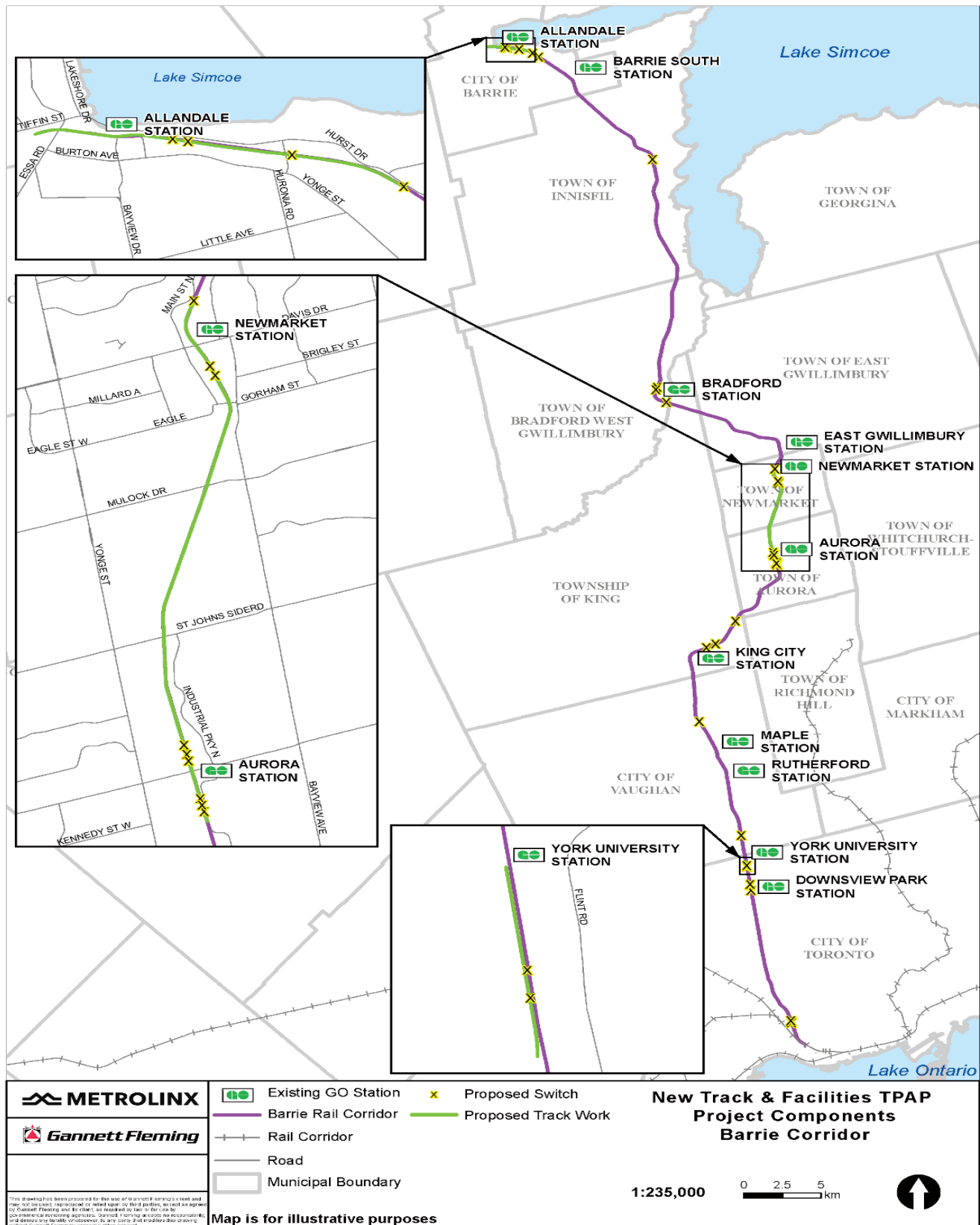


FIGURE 2-4 PROPOSED INFRASTRUCTURE - BARRIE CORRIDOR

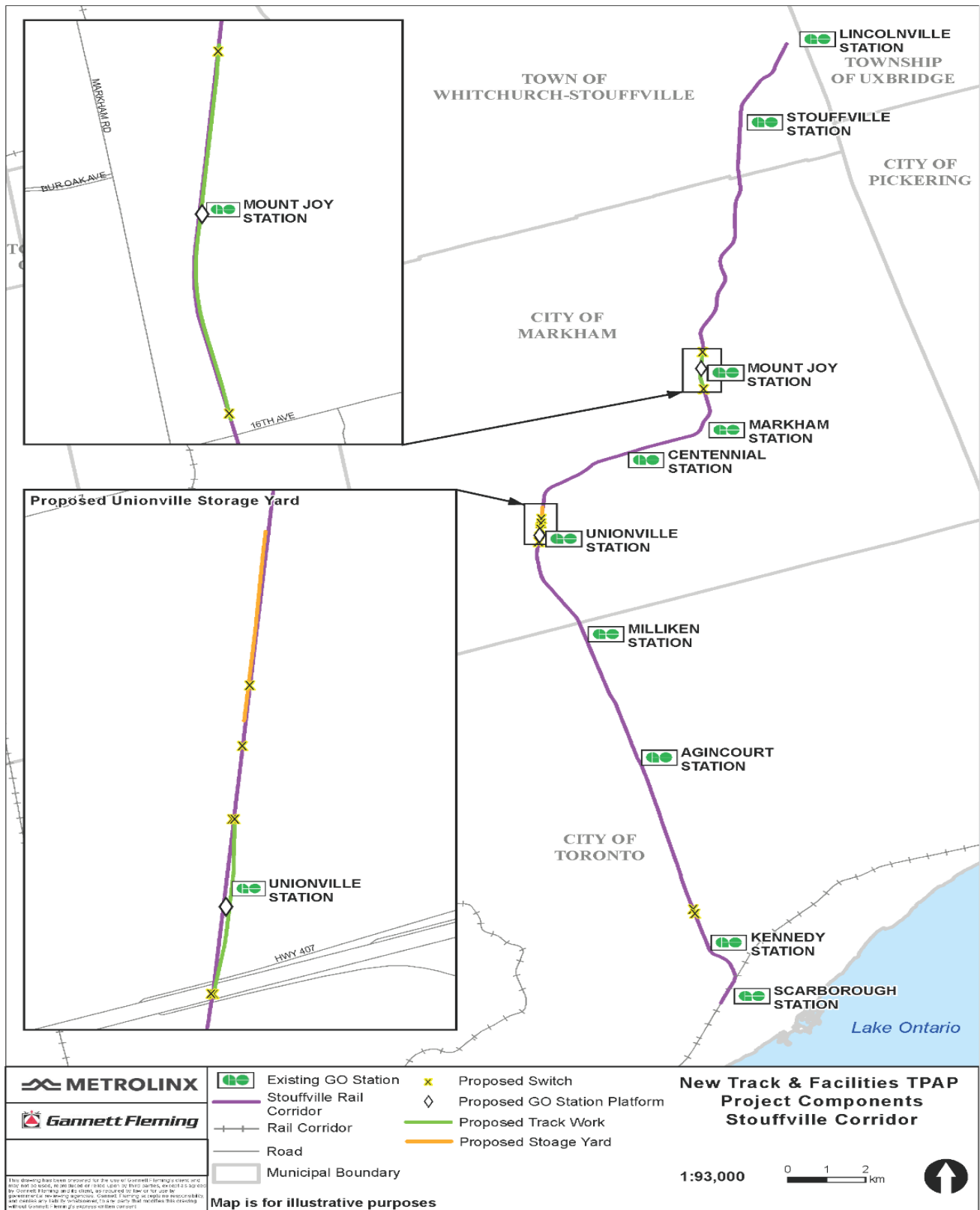


FIGURE 2-5 PROPOSED INFRASTRUCTURE - STOUFFVILLE CORRIDOR

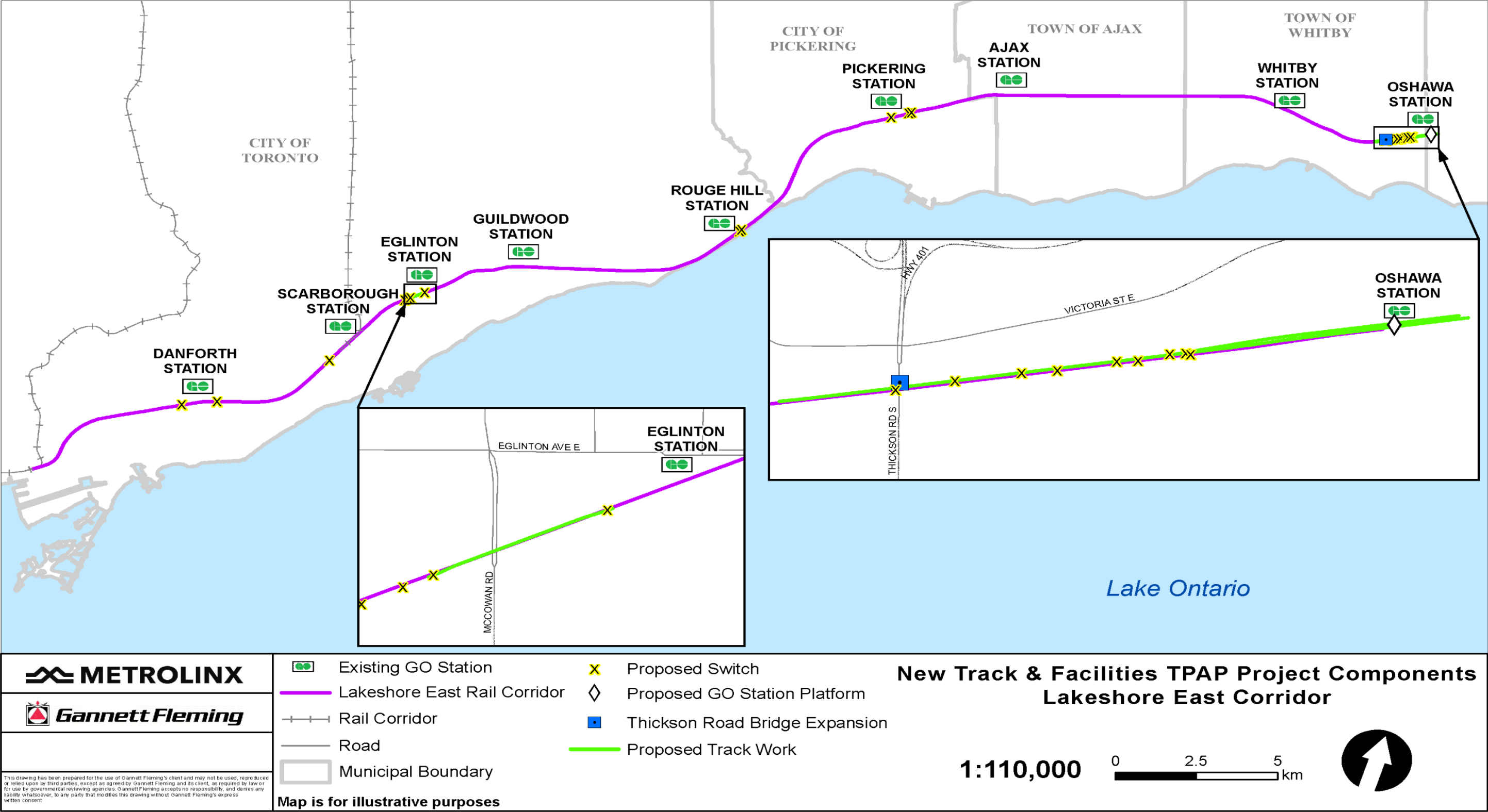


FIGURE 2-6 PROPOSED INFRASTRUCTURE - LAKESHORE EAST CORRIDOR

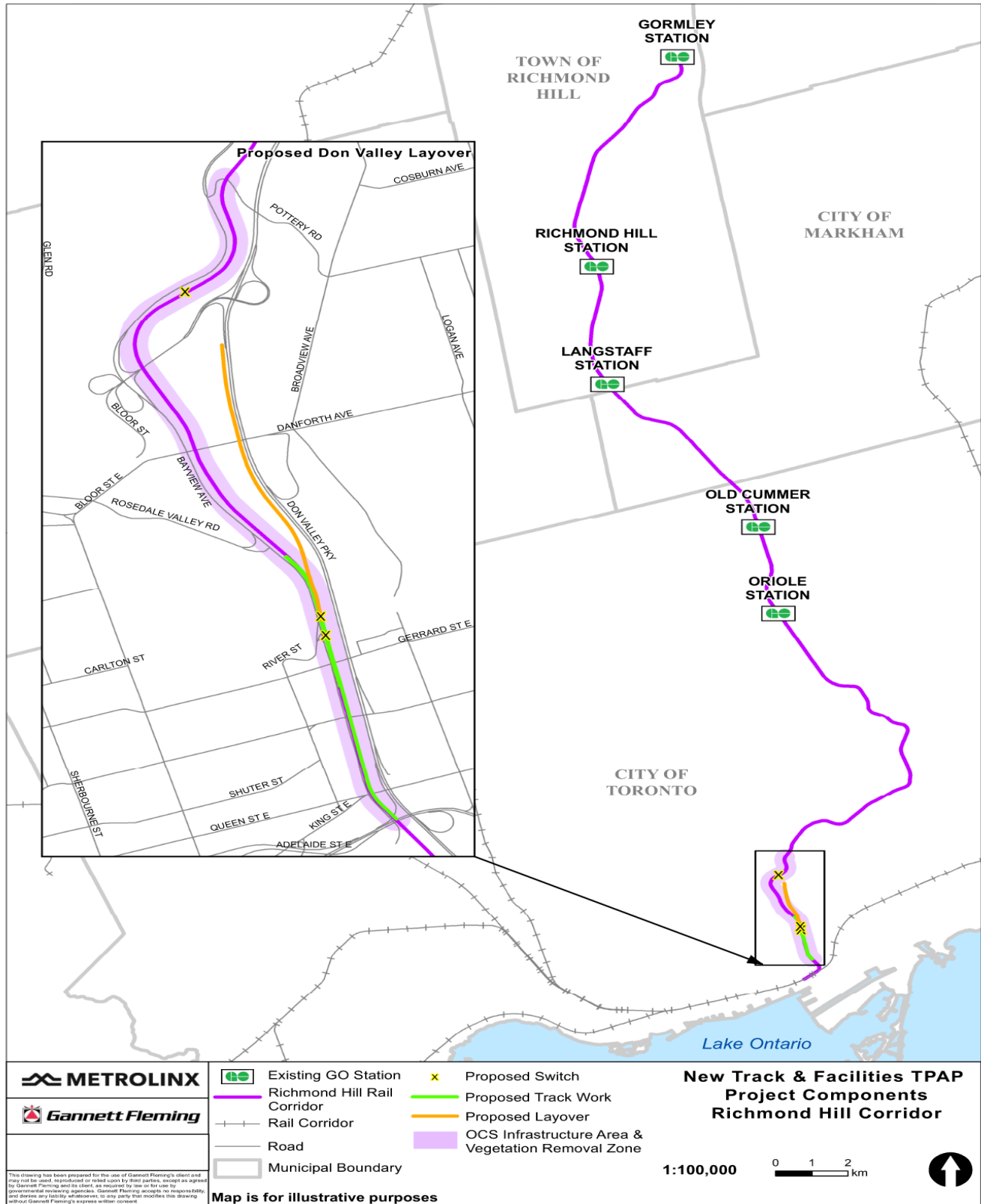


FIGURE 2-7 PROPOSED INFRASTRUCTURE - RICHMOND HILL CORRIDOR