Barrie Rail Corridor Expansion

Transit Project Assessment Process
Environmental Project Report Addendum
New GO Stations

Volume 1: Environmental Project Report Addendum – Main Report

August 2018

METROLINX

4TRANSIT
PARSONS HATCH WSP

Barrie Rail Corridor Expansion - Environmental Project Report Addendum - New GO Stations

Issue and Revision Record					
Rev	**Date**	**Originator**	**Checker**	**Approver**	**Description**
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	Signatures:				

Executive Summary

ES 1 Introduction

Regional Express Rail (RER) is Metrolinx's program to significantly increase rail service across the GO rail network. This expanded service will provide improved travel choices on the GO rail network, including two-way, all day service on five GO corridors, with electrified service in core areas. RER includes:

- Electric trains running every 15 minutes or better, all day in both directions, within the most heavily travelled sections of the network;
- Four times the number of trips outside of weekday rush-hour periods, including evenings and weekends; and
- Twice the number of trips during weekday rush-hour periods.

Sixty-six GO Stations currently serve thousands of customers daily throughout the Greater Golden Horseshoe (GGH). With work already underway to build a connected transit network that supports more frequent, electric, uninterrupted service, Metrolinx is looking at a number of locations for potential new stations.

As part of the RER program, 12 new stations are being added to the GO Transit network, which will support the expansion of the regional rail system and enhance integration with local and municipal transit services, as well as local active transportation infrastructure. Five of the 12 new stations are planned along the Barrie rail corridor and include the Spadina-Front, Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations (see Figure ES 1).

Assessment of the proposed GO Stations ("the Project") is being carried out in accordance with the Transit Project Assessment Process (TPAP). The TPAP is regulated by the *Environmental Assessment Act* (EAA) under *Ontario Regulation 231/08: Transit Projects and Metrolinx Undertakings* (O. Reg. 231/08). An Environmental Project Report (EPR) (dated August 2017) was prepared for the Barrie Rail Corridor Expansion (BRCE) Project in accordance with O. Reg. 231/08 that documented the TPAP for rail infrastructure improvements in the vicinity of the GO Stations. The BRCE EPR received Notice to Proceed on October 5, 2017.

The BRCE EPR stated that the five proposed stations along the Barrie rail corridor would be subject to a future addendum and did not assess the potential environmental effects of the stations. As a result, inclusion of the five GO Stations represents a change to the BRCE Project that is inconsistent with the above-noted EPR. As such, an EPR Addendum is required to document the public consultation efforts for the GO Stations in collaboration with the local municipalities, and to document the potential environmental effects associated with the GO Stations.

Metrolinx retained 4Transit (4T), a joint venture of Hatch, Parsons and WSP, to undertake the EPR Addendum under the TPAP for the five proposed GO Stations. This EPR Addendum documents the TPAP for the Project and has been prepared in accordance with the Ministry of the Environment and Climate Change[1] (MOECC) Guide to Ontario's TPAP (MOE, 2014).

[1] *The Ministry of the Environment and Climate Change (MOECC) changed its name to Ministry of the Environment, Conservation and Parks (MECP) on June 29, 2018. Given the schedule for finalization and*

This EPR Addendum outlines the TPAP followed for the proposed GO Stations, and is defined as the BRCE Project EPR Addendum – New GO Stations.

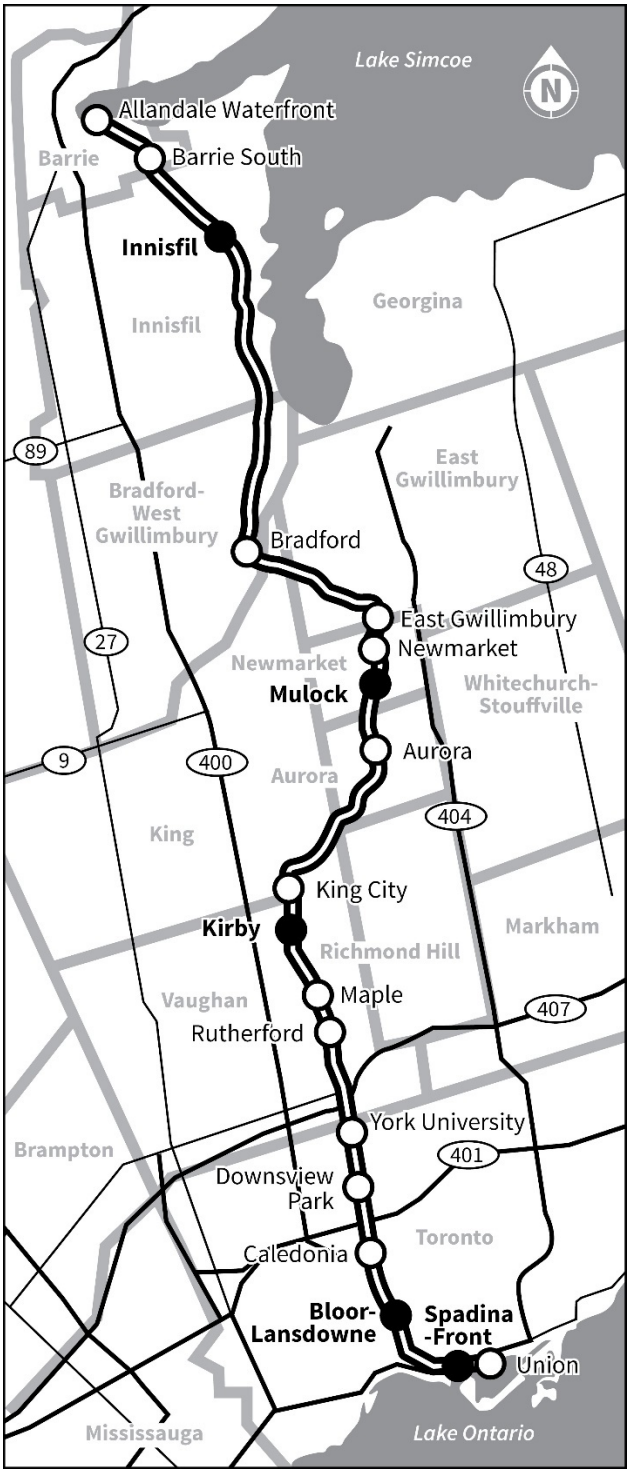


Figure ES 1: Location of Five GO Stations Along Barrie Rail Corridor

printing of the EPR Addendum, the name change for this ministry has not been reflected throughout the EPR Addendum.

ES 1.1 Project Overview

ES 1.1.1 The New GO Stations

The five GO Stations being proposed along the Barrie rail corridor include Spadina-Front GO Station (located in the City of Toronto), Bloor-Lansdowne GO Station (located in the City of Toronto), Kirby GO Station (located in the City of Vaughan), Mulock GO Station (located in the Town of Newmarket) and Innisfil GO Station (located in the Town of Innisfil). The Preferred Designs of each GO Station are provided in Appendix A of Volume 2 through Volume 6 of this EPR Addendum.

ES 1.1.2 Barrie Rail Corridor Overview

Metrolinx owns the Barrie rail corridor and operates a commuter (passenger) rail service between Union Station (Mile 0.00) in the City of Toronto, and the Allandale Waterfront GO Station (Mile 63.00) in the City of Barrie. Oriented generally in a north/south direction, the existing rail corridor consists primarily of a single track, approximately 63 miles in length and services eleven stations (excluding Union Station). Additionally, one station (Caledonia GO Station) is currently planned but not yet under construction. The rail corridor traverses eleven upper- and lower-tier municipalities, including from south to north: City of Toronto, Regional Municipality of York (hereafter referred to as York Region), City of Vaughan, Town of King, Town of Aurora, Town of Newmarket, Town of East Gwillimbury, County of Simcoe, Town of Bradford West Gwillimbury, Town of Innisfil, and City of Barrie.

Trains are currently stored overnight at the Barrie Layover Facility located between Mile 62.17 and Mile 62.84 in the City of Barrie. GO Bus service is available for off-peak hours at all stations along the Barrie rail corridor except at the York University GO Station in the City of Toronto. There are also infrequent Canadian National Railway (CNR) freight and VIA Rail services operating along the Barrie rail corridor.

ES 1.2 Study Area

The TPAP study limits include the study area for each of the five GO Stations on the Barrie rail corridor. Each study area includes the GO Station-specific Project footprint (or development area) and a one kilometre (km) buffer around the GO Station-specific Project footprint.

The Project footprints represent the area where property is required to carry out all physical works and activities either directly for infrastructure or for associated GO Station uses (i.e., parking, tunnels or pedestrian access, and laydown areas). The one km buffer area has been added as it is recognized that some effects may be experienced outside the Project footprint. This buffer area represents an area where effects associated with Project construction and/or operation are likely to occur, such as the off-site migration of dust and noise, for example. Collectively, these areas represent the geographic range over which the potential effects associated with the Project could occur.

The study area represents the geographic area within which the required technical studies were completed in support of this EPR Addendum. For each technical study, the study area varies based upon the subject matter being studied (see Table 1-3), and is based on the varying range within which the potential effects are likely to occur.

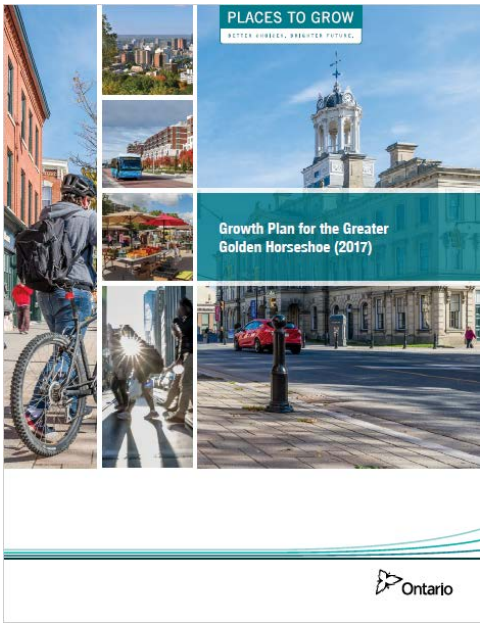
For the purposes of the Transit Project Assessment, existing and future scenarios are defined as follows:

- Current conditions (2017);
- Future with electrification and corridor expansion, but does not include the new five GO Stations (2028) (Future No-Build); and
- Future with electrification and corridor expansion with the inclusion of the five new GO Stations (2028) (Future Build).

ES 1.3 Background and Project Rationale

ES 1.3.1 Planning Context

There are a number of key planning policies, programs, and documents that support the rationale for the Project, including:



- Provincial Policy Statement (PPS), Ontario Ministry of Municipal Affairs (MMA), 2014;
- Growth Plan for the Greater Golden Horseshoe (GPGGH), Ministry of Public Infrastructure Renewal (MPIR), 2013;
- MoveOntario 2020, Government of Ontario, 2007;
- Ontario's Five Year Climate Change Action Plan 2016 – 2020, Government of Ontario, 2016; and

Metrolinx Policies and Programs:

- Regional Transportation Plan (RTP) – The Big Move, Metrolinx, 2008;
- Strategic Plan: GO 2020, GO Transit, 2008;
- Investing in Our Region, Investing in Our Future, Metrolinx, 2013;
- GO Regional Express Rail (RER) Initial Business Case (IBC), Metrolinx, 2015; and
- Metrolinx Sustainability Strategy 2015-2020, Metrolinx, 2016.

ES 1.3.2 Supporting Studies

In June 2016, Metrolinx announced five GO Stations for the Barrie rail corridor. These GO Stations were endorsed by each municipality and received Municipal Council resolution approvals in November 2016. The GO Stations include:

- Spadina-Front (at Front Street) in the City of Toronto;
- Bloor-Lansdowne (Bloor Street near Lansdowne Avenue) in the City of Toronto;
- Kirby (near Keele Street) in the City of Vaughan;

- Mulock (near Bayview Avenue) in the Town of Newmarket; and
- Innisfil (at 6th Line) in the Town of Innisfil.

Metrolinx initially identified over 120 potential new station sites across the Greater Toronto and Hamilton Area (GTHA). These potential sites were scored based on strategic and technical feasibility criteria and subsequently narrowed to approximately 50 locations. The approximately 50 locations were subsequently evaluated based on strategic, economic, technical/operational and cost/revenue considerations to identify 24 sites to be advanced for further analysis. An IBC was undertaken for each of the 24 shortlisted sites to refine the evaluation and determine which sites to carry forward for further consideration. From this process, 12 new stations, including the five GO Stations, were recommended to be included in the GO RER 10-Year Program.

In 2017, the design of the five GO Stations was refined to develop an Initial Preferred Design (IPD, Spadina-Front GO Station) or a Preferred Design (Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations. The IPD/Preferred Design represents the design upon which the TPAP has been conducted.

ES 1.4 Current and Future GO Train Service Levels

At the time of writing (November 2017), commuter rail service along the Barrie rail corridor comprised the following:

Weekday Service:

- Eight southbound trains travelling from the Allandale Waterfront GO Station to Union Station in the A.M. peak period (arriving at Union Station between 6:30 A.M. and 9:30 A.M.). The headway, or the time between successive trains on the route, is between 15 and 30 minutes;
- Eight northbound trains travelling from Union Station to the Allandale Waterfront GO Station in the P.M. peak period (departing Union Station between 3:40 P.M. and 6:45 P.M.). The headway for these trains is approximately 30 minutes; and
- Bus service is also provided to most GO Stations along the Barrie rail corridor.

Weekend Service:

- As of December 31, 2016, year-round weekend GO train service has been offered throughout the day on Saturdays, Sundays and holidays. Three southbound trains run from the Allandale Waterfront GO Station to Union Station in the morning, and seven additional southbound trains run from the Aurora GO Station to Union Station throughout the day, creating approximately 75 minute headways. Six northbound trains run from Union Station to the Aurora GO Station, and three additional northbound trains run from Union Station to the Allandale Waterfront GO Station; and
- GO Bus service between Barrie and Newmarket is also provided to meet train service at the Aurora, East Gwillimbury, and Maple GO Stations.

To accommodate future ridership demand, train service levels will need to be increased. As part of the RER program, it is anticipated that by 2025, a 15 minute bi-directional service will be introduced along the Barrie rail corridor, with improvements in rail service being phased in over several years.

ES 2 Project Purpose

Metrolinx has retained 4T, a joint venture of Hatch, Parsons and WSP, to undertake the EPR Addendum under the TPAP for the five GO Stations. This TPAP reviews the need and justification for the Project, documents the existing conditions and constraints for the proposed Project, provides GO Station concepts and Preferred Design plans, details the environmental impacts or effects and provides recommendations for addressing these effects through further study, mitigation and monitoring.

ES 2.1.1 Support of Regional Express Rail

The five new GO Stations are considered by Metrolinx to be critical to improve local access to higher order rapid transit. Specifically, the GO Stations support improved network connectivity, provide improved access to higher order transit for residents and facilitate transit-oriented development and local community building. Providing additional stops along the Barrie rail corridor will play a key role in supporting the wider RER program through increased ridership and a reduction in congestion on roads and highways in the GGH.

ES 2.1.2 Barrie Corridor Rail Service Expansion

In August 2017, Metrolinx completed a separate EPR for the BRCE Project for the Barrie rail corridor from Union Station in the City of Toronto to the Allandale Waterfront GO Station in the City of Barrie. The study examined the infrastructure needs to expand service along the corridor and identified improvements to enhance the quality of service and provide new transit options. This included installation of a second track between the Aurora GO Station and the Allandale Waterfront GO Station and associated GO Station upgrades. The study stated that five GO Stations (now called Spadina-Front, Bloor-Lansdowne, Kirby, Mulock and Innisfil) would be subject to a future EPR Addendum. This EPR Addendum includes additional studies on the five GO Stations.

Since the completion of the study, implementation of the proposed improvements has commenced. The introduction of new rail infrastructure along the Barrie rail corridor coupled with the GO Stations together support the RER initiative.

ES 3 Transit Project Assessment Process

The TPAP is a focused process, governed by the Ministry of the Environment and Climate Change (MOECC) that recognizes and addresses the predictable environmental impacts and effects of transit projects.

The TPAP is a proponent-driven, self-assessment process that provides a defined framework for the proponent to follow in order to complete the focused assessment of the potential environmental effects and decision-making within a 120-day regulated assessment timeline. Following the 120-day assessment period, the regulation provides an additional 30 days for public and regulatory agency review, and 35-days for the MOECC review. By following the

TPAP, the *Ontario Regulation 231/08: Transit Projects and Metrolinx Undertakings (Transit Projects Regulation)* (O. Reg. 231/08) exempts the proponent (in this case Metrolinx) of the transit project from the requirements under Part II of the Ontario EAA (RSO 1990). The TPAP structure and timescale is illustrated in Figure ES-2.

The TPAP is regulated by the EAA under O. Reg. 231/08. The MOE guide entitled “Ontario’s Transit Project Assessment Process, January 2014” was closely referenced in carrying out the Assessment.

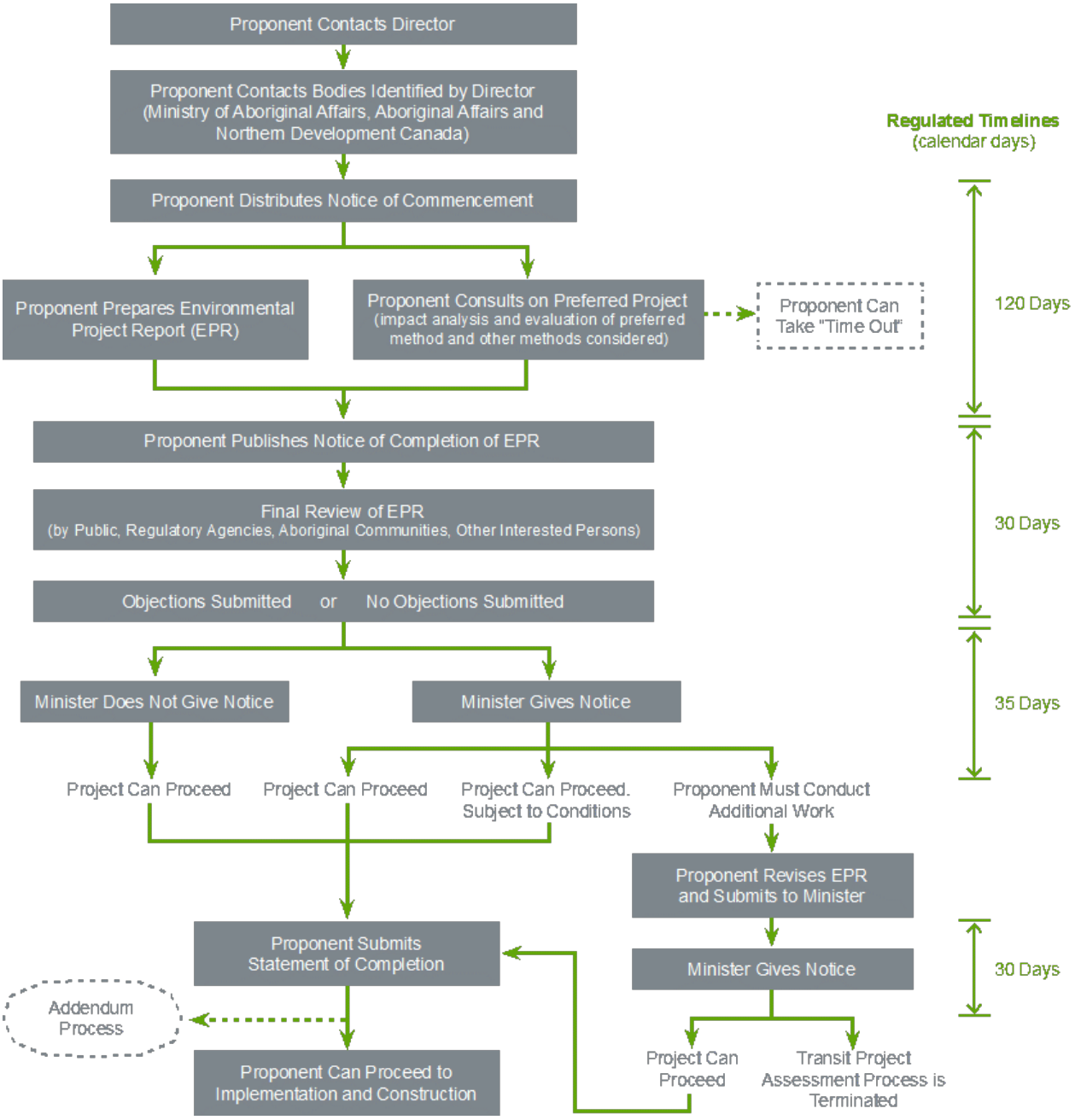


Figure ES 2: Transit Project Assessment Process

ES 4 Environmental Project Report Addendum Structure

This Report has been prepared as an Addendum to the BRCE Project EPR to address the changes to the BRCE Project. It is noted that this Addendum focuses only on changes to the approved BRCE EPR (dated August 2017), that is, inclusion of the five GO Stations (Spadina-Front, Bloor-Lansdowne, Kirby, Mulock and Innisfil).

In order to facilitate the review of this EPR Addendum in the context of the TPAP requirements, a concordance table (Table ES 1) has been prepared. Table ES 1 directs the reader to the various sections of this EPR Addendum where they will find the components of the EPR Addendum that are established in the Guide to Ontario's Transit Project Assessment Process (MOE, 2014).

Table ES 1: Concordance Table

EPR Addendum Requirement	Section of EPR Addendum Where Requirement is Addressed
A description of the changes	Section 1.1.1
Reasons for the changes	Section 1.5.2.2
An assessment and evaluation of any impacts (or effects) that the changes may have on the environment	Section 4.3
A description of proposed mitigation measures for any negative effects that the changes to the BRCE Project may have on the environment.	Section 4.3 and Section 4.4
A statement of whether the proponent (i.e., Metrolinx) believes the change is a significant change to the transit project, and the reasons for the opinion.	Section 1.5.3.2

This EPR acts to document the TPAP and provides a detailed summary of each step of the assessment, including the potential environmental effects, the related measures to mitigate these effects, the future commitments of the Project, and the conclusions reached. The organization of this EPR, as well as the subject matter cointained within the various sections of this Report is outlined and summarized within the sections below.

ES 4.1 Section 1 – Introduction

This section of the EPR Addendum provides context for the Project, describing and providing rational for the proposed changes. The Project, and the specific components of each of the five proposed GO Stations are introduced. Then the planning context, including the evaluation process followed by Metrolinx to assess the new stations, and the purpose of the transit project in relation to the RER Program and BRCE Project is discussed.

The study area for which the supporting technical studies of this EPR evaluated potential effects associated with the Project is defined. Leading to an overview of the TPAP and EPR Addendum processes, and the proposed changes to the BRCE to provide context for this EPR Addendum.

ES 4.2 Section 2 – Project Description

This section describes in detail the proposed features of the Project that are necessary to support the GO Stations on the Barrie rail corridor, and reviews the GO Stations against the key design criteria which helped guide the development of the Preferred Design. These assumptions include:

- Prioritize pedestrian/bicycle access to the GO Station from nearby communities and transit systems;
- Provide connectivity to local transit systems;
- Adhere to GO Design Requirement Manual (DRM) standards for design considerations, as well as Local By-laws;
- Integrate vehicular access to local traffic plans;
- Protect for a third track, required for future expansion;
- Minimize impact to existing utilities; and
- Minimize property acquisition.

Furthermore, this section outlines the outstanding issues that will be addressed prior to construction of the Project.

Based on the information extracted from record drawings a total of 141 potential utility conflicts have been identified at the GO Stations. The potential utility conflicts are all in relation to existing utilities and comparing the utility locations to the GO Stations infrastructure. Metrolinx will take the appropriate measures for conflict resolution with the utility owners.

Property requirements to accommodate all aspects of the five GO Stations were identified. Development of the GO Stations will result in the need for Metrolinx to acquire approximately 25.03 hectares (ha) of lands. This includes approximately 1.55 ha of lands within the City of Toronto, approximately 8.1 ha of lands within the City of Vaughan, approximately 8.9 ha of lands within the Town of Newmarket, and approximately 6.48 ha of lands within the Town of Innisfil.

The Project schedule is planned to continue from 2019 to 2025 throughout which detailed design of all aforementioned Project aspects will be completed and construction undertaken.

ES 4.3 Section 3 – Existing Conditions

This section describes the existing conditions within the GO Station study areas as they relate to the natural, cultural, social and built environments. The description of the natural environment includes details on the physical, terrestrial, aquatic and tree environments. The cultural environment includes archaeological and Cultural Heritage Resources (CHRs), while the social and built environment includes air quality, noise and vibration, traffic and transportation infrastructure, and utilities and municipal infrastructure.

The information presented in this section of the EPR Addendum has been informed by the studies completed for the EPR Addendum Assessment, which are located in the noted

appendices to this EPR Addendum (each GO Station is assembled as Volume 2 through Volume 6, with the Technical Reports in the following order within each GO Station volume):

- Appendix A – Initial Preferred Design (Spadina-Front GO Station) or Preferred Design (Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations);
- Appendix B – Natural Environment Report;
- Appendix C – Tree Inventory Plan;
- Appendix D – Stage 1 Archaeology Assessment;
- Appendix E – Cultural Heritage Studies;
- Appendix F – Socio-Economic and Land Use Study;
- Appendix G – Air Quality Impact Assessment;
- Appendix H – Noise and Vibration Impact Assessment; and
- Appendix I – Transportation and Traffic Impact Analysis (Transportation Brief only for Spadina-Front GO Station).

ES 4.4 Section 4 – Impact Assessment of the Preferred Design

This section presents the assessment of potential environmental effects, associated mitigation and monitoring measures, and future commitments for the Project. It was prepared based on a compilation and summary of the results from the various studies conducted and documented in the appendices to this EPR Addendum. The impact assessment of the GO Stations in this EPR Addendum is structured according to the following aspects and Project components:

- Climate Change;
- GO Station Pre-Construction/Land Clearing;
- GO Station Construction; and
- GO Station Operations and Maintenance.

Technical studies only considered project phases that have the potential to impact their field of study. Pre-construction land clearning/property acquisiton was only considered for the following technical studies: Natural Environment Reports (NERs) and Socio-Economic and Land Use Studies (SELUS).

The analysis and recommendations summarized in this section are based on information available at the time of the TPAP. During the detailed design phase of the Project, more information will be known about how the Project may affect the natural, cultural and/or social and built environments. As such, recommendations shall be reviewed and updated throughout detailed design and prior to construction of the Project.

ES 4.4.1 Climate Change

The effect of the Project on climate change has been considered, specifically on how the Project would reduce the natural environment's ability to remove carbon from the atmosphere.

In conjunction with Metrolinx's Sustainability Strategy 2015 – 2020, the Project will support Ontario's overall Greenhouse Gas (GHG) emissions by promoting a shift from single-occupant vehicles to more energy-efficient options like walking, cycling, carpooling, and teleworking. The goals of the Sustainability Strategy will be implemented through the following:

- Implementation of the Project will promote public transportation by enabling two-way, | all-day service which will attract new ridership through the provision of increased capacity, faster service, and scheduling flexibility;
- The future transition of up to 180 electric trains on the expanded Barrie rail corridor will eliminate GHG emissions associated with diesel trains along the rail corridor since electric trains do not produce air emissions at the point of use. During the transition of the fleet engines, it is anticipated that no more than 36 of the 180 trains per day will be diesel; therefore, the air emissions, once the line is electrified, will be the same or lower with the ultimate expectation that there will be no local emissions. Air emissions associated with electricity generation required to power the electric trains will instead occur at regulated electricity generation facilities; and
- The construction of the Project will require the removal of trees and vegetation, which will result in a temporary loss of an existing carbon sink within the local study area environment. Trees will mainly be compensated through off-site plantings, coordinated with the Toronto and Region Conservation Authority (TRCA), Lake Simcoe Region Conservation Authority (LSRCA) and affected municipalities. The compensation plantings will comprise of high quality, long living, native species that will continue to sequester carbon throughout their long lifespan.

Consideration has been given on how the changing climate has the potential to impact the Project for both the short-term and long-term phases of the Project.

In order to consider the potential implications of the changing climate, a number of storms that exceed the current design standard and the most up-to-date Intensity Duration Frequency (IDF) curves will be used in the design of stormwater systems. A detailed Stormwater Management (SWM) Plan will be developed prior to the construction phase of the Project to ensure that runoff from rainfall is controlled.

An increase in storm intensity can make erosion and sedimentation more likely in the GO Station study areas, especially during construction. Thus, Erosion and Sediment Control (ESC) measures based on the guidelines of the relevant conservation authority will be implemented during the construction phase of the Project to ensure stormwater runoff entering area sewers and watercourses is not laden with sediment. During the construction of the Mulock and Innisfil GO Stations the LSRCA Technical Guidelines for Stormwater Management Submissions (LSRCA, 2016) will be followed to inform ESC measures.

ES 4.4.2 Impact Assessment, Mitigation and Monitoring Plan

An Impact Assessment, Mitigation and Monitoring Plan has been developed and included in this section, summarizing the following information in tabular format for each potential effect as it relates to the Project:

- Project Phase;

- Site/Location of Potential Effect;
- Feature;
- Description of Potential Effect;
- Mitigation Measure; and
- Monitoring Activity.

ES 4.4.3 Environmental Mitigation and Monitoring Plan

An Environmental Mitigation and Monitoring Plan (EMMP) will be developed prior to Project construction. The EMMP will provide direction such that the implementation of the Project does not result in negative effects on matters of provincial importance related to the natural environment, properties of Cultural Heritage Value or Interest (CHVI), or on constitutionally protected Aboriginal or Treaty Rights. Table ES 2 provides a list of the matters that may be relevant in determining provincial importance (as per the Guide to Ontario's Transit Project Assessment Process (MOE, 2014)).

The EMMP will also address potential environmental impacts or approval requirements that arise prior to construction and/or during additional environmental studies, that will be carried out for the Project.

Table ES 2: Matters of Provincial Importance

Matters of Provincial Importance[1]	Definition[2]	Applicability to the Project
A park, conservation reserve or protected area.	A provincial park, conservation reserve or provincially protected area designated by the province.	There are no provincial parks or conservation reserves within the GO Station study areas.
Extirpated, Endangered, Threatened, or species of special concern and their habitat.	A species at risk (SAR): Extirpated, Endangered, or Threatened species and their habitat. A Species of Conservation Concern (SCC): Rare or substantially declining species or have a high percentage of their global population in Ontario. Special concern species identified on the Species at Risk in Ontario (SARO) List that were formally referred to as "vulnerable" in the Significant Wildlife Habitat Technical Guide (SWHTG) (Ministry of Natural Resources and Forestry (MNRF), 2000). Species identified as nationally Endangered or Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which are not protected in regulation under Ontario's ESA.	There are number of potential impacts to SAR and SCC due to the removal of portions of land within the GO Station footprints that provide habitat for these species.

Matters of Provincial Importance[1]	Definition[2]	Applicability to the Project
A wetland, woodland, habitat of wildlife or other natural heritage area.	A Significant Wetland, Significant Woodland, Significant Valleyland or SWH as defined in Section 2.1.5 of the PPS (2014). A Natural Area Abutting Lake Simcoe as defined in policy 6.21-DP of the Lake Simcoe Protection Plan (LSPP).	There are portions of candidate SWH that will be removed as a part of construction of the Project. Portions of Significant Wetland and Valleyland may be impacted by the Project.
An area of natural or scientific interest (ANSI).	A Significant ANSI as defined in Section 2.1.5 of the PPS (2014).	There are no Significant ANSI and no Candidate ANSIs within the GO Station study areas that may be affected by the Project.
A stream, creek, river or lake containing fish and their habitats.	A stream, creek, river or lake containing fish and their habitats.	There is a one watercourse within the within the Mulock study area, which provides direct fish habitat. There is one permanent watercourse and two grassed swales within the Kirby study area. Further aquatic habitat field investigations will be required to determine if the Project presents any potential impact to fish or fish habitat.
An area or region of surface water or groundwater or other important hydrological feature.	An area or region of surface water or groundwater or other important hydrological feature.	There is one Wellhead Protection Area (WHPA) present within the Mulock study area. However, there are no proposed activities related to the operation of the Mulock GO Station that would constitute a threat to the drinking water. Thus, no negative effects resulting from the operation of the GO Station are anticipated. Construction-related mitigation measures have been identified.
Protected heritage property.	Property designated under Parts IV, V or VI of the *Ontario Heritage Act (*OHA); property subject to a heritage conservation easement under Parts II or IV of the OHA; property identified by the Province and prescribed public bodies as Provincial Heritage Property (PHP) under the Standards and Guidelines for Conservation of Provincial Heritage Properties; property protected under federal legislation, and United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites.	Two properties protected under Part IV, and two Heritage Conservation Districts protected under Part V of the OHA were identified within the GO Station study areas. Further study and construction-related mitigation measures have been identified.

Matters of Provincial Importance[1]	Definition[2]	Applicability to the Project
Built heritage resources (BHR).	A building, structure, monument, installation or any manufactured remnant that contributes to a property's CHVI as identified by a community, including an Aboriginal community. Built heritage resources (BHRs) are generally located on property that has been designated under Parts IV or V of the OHA, or included on local, provincial and/or federal registers.	In addition to the properties protected under Parts IV and V of the OHA, there are also six properties listed under municipal heritage registries and identified as Provincial Heritage Properties.
Cultural heritage landscapes (CHL).	A defined geographical area that may have been modified by human activity and is identified as having CHVI by a community, including an Aboriginal community. The area may involve features such as structures, spaces, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association. Examples may include, but are not limited to, heritage conservation districts designated under the OHA, villages, parks, gardens, battlefields, mainstreets and neighbourhoods, cemeteries, trailways, viewsheds, natural areas and industrial complexes of heritage significance; and areas recognized by federal or international designation authorities (i.e., a National Historic Site or District designation, or a UNESCO World Heritage Site).	
Archaeological resources and areas of potential archaeological interest.	Includes artifacts, archaeological sites, marine archaeological sites, as defined under the OHA. The identification and evaluation of such resources are based upon archaeological fieldwork undertaken in accordance with the OHA. Areas with the likelihood to contain archaeological resources. Methods to identify archaeological potential are established by the Province, but municipal approaches which achieve the same objectives may also be used. The OHA requires archaeological potential to be confirmed through archaeological fieldwork.	There are areas with archaeological potential within the GO Station study areas. These are being further investigated through Stage 2 Archaeological Assessments (AAs).

Matters of Provincial Importance[1]	Definition[2]	Applicability to the Project
An area designated as an escarpment natural area or an escarpment protection area by the Niagara Escarpment Plan under the *Niagara Escarpment Planning and Development Act.*	An area designated as an escarpment natural area or an escarpment protection area by the Niagara Escarpment Plan under the *Niagara Escarpment Planning and Development Act.*	The GO Station study areas do not fall within the Niagara Escarpment Plan Area.
Property within an area designated as a natural core area or natural linkage area within the area to which the Oak Ridges Moraine Conservation Plan (ORMCP) under the *Oak Ridges Moraine Conservation Act*, 2001 (ORMCA) applies.	Property within an area designated as a natural core area or natural linkage area within the area to which the ORMCP under the ORMCA applies.	The Project is not located within ORMCP lands.
Property within an area described as a key natural heritage feature (KNHF) or a key hydrologic feature (KHF) in the Protected Countryside by the Greenbelt Plan under the *Greenbelt Act,* 2017.	Property within an area described as a KNHF or a KHF in the Protected Countryside by the Greenbelt Plan under the *Greenbelt Act,* 2017.	The project is not located within the Greenbelt Area; therefore, no land within the Greenbelt Area identified as a KNHF or a KHF will be removed due to the Project.

Note:

[1] Examples as listed in the Guide to Ontario's Transit Project Assessment Process (MOE, 2014).

[2] Definitions are based on applicable regulations, agency consultations or the Guide to Ontario's Transit Project Assessment Process (MOE, 2014).

ES 4.5 Section 5 – Stakeholder Consultation Process

Consultation is an essential component of the Project as it is integral to share information, generate ideas and identify stakeholder issues. An extensive communication and consultation program was undertaken for the New GO Stations to meet and exceed the requirements of Ontario Regulation 231/08 and to inform the community and seek feedback on various aspects of the Project. The general purpose of the consultation program was to identify stakeholders, introduce the EPR Addendum and gather preliminary concerns and comments. The Stakeholder Consultation Report (SCR) (Appendix A of Volume 1 of this EPR Addendum) documents the communication and consultation with the public and stakeholders prior to the Notice, distribution of the EPR Addendum and it's supporting technical studies, and preparation and distribution of the Notice.

The EPR Addendum consultation process was initiated in the summer of 2017, continued through the fall of 2017 and winter of 2018, and included:

- Consultation with the Director, MOECC Environmental Assessment and Permissions Branch (EAPB);
- Preparation of a Master Contact List;
- Establishment of a Project specific Website (http://www.metrolinx.com/newstations);
- Convening Public Meeting #1 (October 2017) in the City of Toronto (for Toronto GO Stations only);
- Convening Public Meeting #2 (March 2018) in the City of Toronto (for Toronto Stations only);
- Convening Public Meeting #1 (April 2018) in the City of Vaughan, Town of Newmarket and Town of Innisfil;
- Convening of Online Town Halls (June 2018) in the City of Toronto (for Toronto Stations only);
- Undertaking Indigenous engagement through identification of and correspondence and meetings with, Indigenous communities and organizations that may have an interest in the Project;
- Convening EA briefs and preliminary design meetings with elected officials, regulatory review agencies, conservation authorities and potentially affected municipalities leading to creation of TACs;
- Convening TAC meetings to provide an overview of public consultation efforts, present preliminary drawings and technical work, identify EPR Addendum developments and obtain input on the EPR Addendum; and
- Circulating draft Technical Reports and the draft EPR Addendum to review agencies, Indigenous communities and other stakeholders.

ES 4.5.1 Consultation with the Director

Metrolinx worked to identify a list of Indigenous communities and organizations who may potentially be interested in the Project. Input was sought from the MOECC EAPB about which communities and organizations to include. On October 2, 2017, a formal request was sent to the MOECC EAPB for a list of Indigenous communities that may be interested in the Project. The MOECC's response was taken into account in the development of the list of potential interested Indigenous communities located within 100 kilometers of the study area provided below. The Aboriginal and Treaty Rights Information System (ATRIS) of Indigenous and Northern Affairs Canada (INAC), was referenced to further develop the list of Indigenous communities that may have an interest in the EPR Addendum.

As a result, the following Indigenous communities and organizations were identified as potentially interested in the Project. These communities and organizations were provided with Project information, study updates, draft reports for review and invitations to meet to discuss the Project and provide comments:

- Georgian Bay Métis Council;
- Haudenosaunee Confederacy Chiefs Council;
- Huron Wendate Nation;
- Kawartha Nishnawbe First Nation;
- Métis Nation of Ontario;
- Mississaugas of the New Credit First Nation;
- Moon River Métis Council;
- Moose Deer Point First Nation;
- Six Nations of the Grand River;
- Wahta Mohawks; and
- Williams Treaties First Nations:
  - Alderville First Nation;
  - Beausoleil First Nation;
  - Chippewas of Georgina Island:
  - Chippewas of Rama First Nation;
  - Curve Lake First Nation;
  - Hiawatha First Nation; and
  - Mississaugas of the Scugog Island First Nation.

Contact information was collected for those communities with a potential interest in the EPR Addendum and included in the Master Contact List, provided in the SCR in Appendix A of Volume 1 of this EPR Addendum.

ES 4.5.2 Master Contact List

A Master Contact List was compiled consisting of regulatory agencies, conservation authorities, municipalities, Indigenous communities and organizations and other parties who may have an interest in the EPR Addendum based on the proposed Project works, proximity to the Project and/or from an expressed interest in the BRCE EPR, and were identified on the BRCE EPR contact list. The Master Contact List was developed following initial consultations with the Director of the MOECC, subsequent agency consultation and results of the ATRIS search. As well, affected municipalities within the study area were contacted to obtain lists of addresses of property owners within 30 metres for all GO Stations. The Canada Post Precision Targeter tool was used to identify properties within 200 metres for Toronto stations and 400 metres for all other stations to distribute Notifications. The Master Contact List included the following:

- The Director of the MOECC EAPB;
- The Director of the MOECC Regional Office;

- Indigenous communities and organizations;
- Landowners with properties located within 30 metres of the station footprints;
- Local municipalities (City of Toronto, Regional Municipality of York, hereafter referred to as York Region (including the City of Vaughan and Town of Newmarket) and County of Simcoe (including the Town of Innisfil));
- Conservation authorities with jurisdiction within 30 metres and 100 metres measured from the proposed station footprints;
- Applicable regulatory agencies, in accordance with Schedule 2 of O. Reg. 231/08; and
- Other people, groups or organizations who may have an interest in the EPR Addendum (i.e., rate payers' groups, business improvement area groups, community organizations, etc.).

The Master Contact List was continually updated in response to Project feedback and stakeholder interest, and was used for the distribution of the Notice of EPR Addendum and project consultation notices for Public Meetings and Online Town Halls. As correspondence from stakeholders, regulatory agencies, conservation authorities, municipalities and Indigenous communities was received, the Master Contact List was used to track correspondence to ensure comments were considered and incorporated into the decision-making process for the EPR Addendum. A copy of the Master Contact List (excluding private landowners) is provided in the SCR found in Appendix A of Volume 1 of this EPR Addendum.

ES 4.5.3 Project Website and Social Media

A Project website (http://www.metrolinx.com/newstations) was developed to provide an overview of the consultation process and to keep the public informed of public meetings, provide summaries of public meetings, as well as to afford them an opportunity to provide their respective comments. The website was updated with Project information and notices throughout the consultation process. Additionally, a website was also developed to provide information and updates to the public on SmartTrack stations (http://www.smarttrack.to/), which were being assessed under a separate process, and included information on the new GO Stations being planned within Toronto.

ES 4.5.4 Stakeholder Consultation

Public Meeting #1 – Spadina-Front and Bloor-Lansdowne GO Stations

As part of the consultation process, a Public Meeting (Public Meeting #1) was held on October 12, 2017 at the New Horizons Tower located in the City of Toronto. The purpose of Public Meeting #1 was to discuss the proposed new SmartTrack and GO Stations, with specific focus on eight Toronto-based stations, including Spadina-Front and Bloor-Lansdowne GO Stations, and present information regarding Metrolinx's transportation goals and background on the EPR Addendum, while providing the public with an opportunity to comment on the Project.

The Notice of Public Meeting #1 included date, location, time and Project purpose. The Notice was posted in the Toronto Metro newspaper. It was also published in the Senthamarai (Tamil), Ming Pao (Manderin) and Sing Tao (Traditional Chinese) newspapers, posted on the Metrolinx and City of Toronto websites, and on Metrolinx's Twitter feed. The Notice of Public Meeting #1

was delivered to all property owners within 100 metres of the Barrie rail corridor (measured from the limit of the ROW).

Comments received as a result of Public Meeting #1 noted concerns regarding noise, increased pedestrian and vehicle traffic, construction impacts and safety of residents. Details of the public meetings including a summary of issues/concerns and BRCE EPR Addendum Project team responses, are provided in the Public Meeting #1 Summary Report included in the SCR provided in Appendix A of Volume 1 of this EPR Addendum.

Public Meeting #2 – Spadina-Front and Bloor-Lansdowne GO Stations

As part of the consultation process, a Public Meeting (Public Meeting #2) was held on March 1, 2018 at Lithuanian House in the City of Toronto. The purpose of Public Meeting #2 was to present information on the draft technical studies that had been undertaken as part of the TPAP process and also provide an update on the station designs while providing the public with an opportunity to comment on the Project.

The Notice of Public Meeting #2 included dates, location, time and Project purpose. The Notice was posted in local newspapers, including the Toronto Metro, and French language newspaper Toronto L'Express. It was also published in the Senthamarai (Tamil), Ming Pao (Manderin) and Sing Tao (Traditional Chinese) newspapers. Details of the public meetings were displayed on televisions at all TTC subway plateforms and in advertisements at select existing GO stations, on the Project and City of Toronto websites, with messaging also displayed on the Metrolinx (@MXNotices) and Toronto (@TorontoComms and @CityPlanTO) Twitter feeds. The Notice of Public Meeting #2 was delivered to all stakeholders on the Master Contact List. The Notice of Public Meeting #2 was delivered by addressed mail to property owners within 30 metres of each station study area and delivered via Canada Post unaddressed mail drop to properties within a 200 metres radius from each station.

Comments received as a result of Public Meeting #2 noted concerns regarding traffic, noise, vibration, construction impacts, air quality, connections and pedestrian access. Details of the public meetings including a summary of issues/concerns and BRCE EPR Addendum Project team responses, are provided in the Public Meeting #2 Summary Report included in the SCR provided in Appendix A of Volume 1 of this EPR Addendum.

Public Meeting #1 – Kirby, Mulock, and Innisfil GO Stations

As part of the consultation process, Public Meetings (Public Meeting #1) were held on three separate dates in April of 2018, in the Town of Innisfil at Cookstown Library and Community Centre on April 3, in the Town of Newmarket at the Newmarket Municipal Offices on April 5, and in the City of Vaughan at the Vellore Village Community Centre on April 30 for the Innisfil, Mulock and Kirby GO Stations, respectively. The purpose of Public Meeting #1 was to present information about the Project and EPR Addendum process, present information about the RTP which guides the work being carried out to transform the transportation network in the GTHA and to provide the public with an opportunity to comment on the Project.

The Notices of Public Meeting #1 included the dates, locations, time and Project purpose. The Notices were posted in local newspapers (Barrie Advance, Innisfil Journal, Newmarket Aurora Era Banner, and Vaughan Citizen) and French language papers (Toronto Le Metropolitain and Toronto L'Express), notices were also posted on the Project Website, with messaging

displayed on the Metrolinx Twitter feed. A general unaddressed ad mail (Canada Post drop) of the notices was sent to property owners within a minimum of 400 metres of each station footprint. In addition to the general ad mail, addressed mail was sent to all property owners whose properties were identified (via municipal records and GIS mapping), to be within 30 metres of each station footprint. In addition, personalized addressed letters were sent to owners of properties identified as potentially directly impacted by the Project (i.e., acquisition, easement, etc.), in addition to the notification.

Comments received as a result of Public Meeting #1 noted concerns related to noise and vibration, coordination of local transit and station access, lack of available parking, potential impacts on traffic, LOS and scheduling of additional GO service, accessibility of stations and potential need for property acquisitions. A summary of issues/concerns and BRCE EPR Addendum Project team responses, are provided in the Public Meeting #1 Summary Report included in the SCR provided in Appendix A of Volume 1 of this EPR Addendum.

Online Town Hall – Spadina-Front and Bloor-Lansdowne GO Stations

As part of the consultation process, Online Town Halls were conducted via telephone and online on June 20, 2018 for Spadina-Front GO Station and June 21, 2018 for Bloor-Lansdowne GO Station. The purpose of the Online Town Halls was to provide an update of the work underway, including environmental studies for the new SmartTrack and GO Stations.

The Notice of the Online Town Halls included meeting details such as the dates, time, connection instructions and Project purpose. Participants attended the Online Town Halls by visiting smarttrack.to/townhall or by calling 800-457-6180. The notification was posted in local newspapers including the Toronto Metro, and French language newspapers Toronto L'Express and Le Metropolitain. It was also published in the Senthamarai (Tamil), Ming Pao (Manderin), Sing Tao (Traditional Chinese), Philippine Reporter, Sol Português (Portuguese), Bloor West Village/Annex Guardian, East York and Beach Mirror, Etobicoke Guardian, Scarborough Mirror, and Caribbean Camera newspapers and posted on Metrolinx's website with messaging displayed on the Metrolinx Twitter feed.

Recordings and transcripts of the Online Town Halls are available on the Project website.

Public and Property Owner Correspondence

Comments were received from the public and other stakeholders through the dedicated email address for the Project (newstations@metrolinx.com), as well as through the dedicated SmartTrack email address (SmartTrack@toronto.ca), throughout the consultation process, exclusive of public meetings. Correspondence generally included requests to be included on the mailing list and requests for Project information following public meetings.

Other submissions were of a specific nature, noting questions/concerns with the EPR Addendum. Key themes of the comments included:

- Concern with train whistle blowing;
- Potential Impacts to property;
- Traffic impacts during construction;
- Station design (i.e., accessibility, parking, cycling and pedestrian infrastructure);

- Coordination of service with local transit; and
- Safety and development of crossings.

Written submissions and Project team responses are provided in the SCR found in Appendix A of Volume 1 of this EPR Addendum.

ES 4.5.5 Indigenous Community and Organization Consultation

Metrolinx contacted and/or engaged Indigenous communities and organizations identified as having potential interest in the Project, through written correspondence, by email and newsletters, as well as by phone. Written correspondence to Indigenous communities and organizations was delivered by registered mail and email at the following Project milestones in preparation for the EPR Addendum:

- Indigenous community meeting with Huron-Wendat Nation – September 6, 2017;
- Request for Input, Offer for Community Meeting and Invitation to Public Meeting #1 – September/October 2017;
- Project Update, Request for Input, Offer for Community Meeting and Invitation to Public Meeting #2 – Febuary 2018;
- Indigenous community meeting with the Williams Treaties First Nations – March 19, 2018;
- Invitation to Public Meeting #1 – March and April 2018;
- Circulation of Draft Stage 1 Archaeological Assessments – May 2018;
- Indigenous community meeting with the Williams Treaties First Nations – June 8, 2018;
- Invitation to Online Town Hall – June 13, 2018; and
- Indigenous community meeting with the Mississaugas of the New Credit First Nation – July 18, 2018.

A summary of comments provided by Indigenous communities is as follows:

- Huron Wendat Nation – Comments received were specific to the Stage 1 archeological assessments (Toronto-based stations) that were provided for review; and
- Mississaugas of the New Credit First Nation – Comments received were specific to the Stage 1 Archeological Assessments (Toronto-based stations) that were provided for review.

ES 4.5.6 Agency and Municipal Consultation

As part of the consultation process, Metrolinx met with elected officials, regulatory agencies, conservation authorities and municipalities with jurisdiction within the Barrie rail corridor. During the summer and fall of 2017, Metrolinx initially met with elected officials, agencies and municipalities on an individual basis to present an overview of the New GO Stations. Following these preliminary meetings, TACs were established by municipality and grouped by Region, and up to four of TAC meetings by station were held as the Project progressed. Additionally,

elected officials, agencies and municipalities provided input to the Project through scheduled meetings and written correspondence regarding Project specific questions.

Meetings with Regulatory Agencies, Conservation Authorities, Municipalities and Technical Advisory Committees

At each meeting, Metrolinx presented an overview of the BRCE EPR Addendum Project status, reviewed preliminary plans and drawings, as well as discussed issues of importance or concern with participants such as technical study methodology and results. Meeting dates, participating regulatory agencies and elected officials are listed in the SCR provided in Appendix A of Volume 1 of this EPR Addendum.

Meetings with Elected Officials

Metrolinx met with Members of Provincial Parliament (MPPs) during a Barrie RER Committee meeting held on November 8, 2017, to present an overview of the Project. As the Project progressed, Members of Parliament (MPs), MPPs and elected officials were notified of public meetings, offered project briefings and informed of the opportunity to provide input to the Project. Correspondence with elected officials is provided in the SCR in Appendix A of Volume 1 of this EPR Addendum.

Regulatory Agency, Conservation Authority and Municipal Correspondence

In addition to the meetings described above, written correspondence was also received from elected officials, agencies and municipalities. Correspondence was received from the MNRF, TRCA, LSRCA, MOECC, Transport Canada, Ontario Heritage Trust, and MTO, as well as provincial, federal and municipal elected officials. Municipal correspondence was received from staff of the City of Toronto, York Region, City of Vaughan, Towns of Newmarket, the County of Simcoe, and the Town of Innisfil. Copies of correspondence are provided in the SCR (Appendix A of Volume 1 of this EPR Addendum) and generally included acknowledgement of receipt of Notice(s) as well as contacts for correspondence and TAC meeting participation.

Comments of a specific nature, noting questions/concerns, are summarized by key theme, and provided in the SCR (Appendix A of Volume 1 of this EPR Addendum).

ES 4.5.7 Review of Draft Technical Reports and Draft Environmental Project Report to Regulatory Agencies, Conservation Authorities, Municipalities and Indigenous Communities and Organizations

Regulatory agencies, conservation authorities, Indigenous communities and organizations, and municipalities were provided with an opportunity to review draft Technical Reports and the EPR Addendum prior issuing to the Notice of EPR Addendum. Select individual draft Technical Reports were forwarded to those agencies anticipated to have a specific interest in the subject matter in advance of the comprehensive draft EPR Addendum. The draft EPR Addendum was provided to those agencies considered to have an interest in the Project.

Metrolinx will incorporate the comments and input as appropriate from stakeholders into the design of the GO Stations prior to and throughout the detailed design phase of the Project.

ES 4.5.8 Notice of EPR Addendum

The Notice of EPR Addendum was published on August 2, 2018. The Notice was distributed by addressed mail to all property owners within 30 metres of each GO Station footprint and distributed as an unaddressed community mailer to residents within 200 metres of each Toronto station and 400 metres of other stations. The Notice of EPR Addendum was posted on the Project and SmartTrack project websites, posted in local newspapers, distributed by email to all contacts on the master contact list which includes interested and affected residents, anyone who has expressed an interest in the Project, regulatory agencies, conservation authorities, municipalities and Indigenous communities and organizations.

The Notice of EPR Addendum provided the public and all communities with the remaining milestones and dates for the Project, along with the opportunity to review the EPR Addendum and submit comments.

Following the 30-day public review period, the Minister has 35 days to provide comment and decide whether the EPR Addendum has any negative effects of Provincial significance and if the proponent is required to take further steps. The Minister then issues a Notice to Allow a Change to a Transit Project in Accordance with an Addendum. The Notice will be posted on both the City of Toronto and Metrolinx websites.

ES 4.6 Section 6 - Permit and Approval Requirements

There are a number of permit, approval and agreement requirements by federal, provincial, municipal agencies, conservation authorities, utilities and transit/rail corporations for all phases of the Project including the detailed design, construction and post-construction periods in order for implementation to proceed. This section of the EPR Addendum identifies the permit, approval and agreement requirements anticipated to be required for the work activities associated with the Project.

ES 4.7 Section 7 - Future Commitments

This section presents the future commitments to be carried out prior to, during and after Project construction. As noted therein, there are a number of future commitments that will be undertaken throughout detailed design and prior to construction of the Project, which may lead to refinement or modification of the GO Stations as described in this EPR Addendum.

To enable the potential environmental effects associated with the Project to be avoided/minimized/mitigated to the extent possible, the following actions will be carried out by Metrolinx throughout detailed design and prior to construction:

- Prepare and implement an EMMP (including reporting requirements) throughout detailed design and prior to construction, to ensure compliance with the commitments listed in this EPR Addendum, and to confirm the mitigation and monitoring measures identified herein are implemented and functioning in the manner prescribed;
- The EMMP will be appended to all Construction Contract Documents to ensure that all mitigation measures are captured in the Construction Contract Documents and are implemented;

- Undertake all additional studies/work as outlined in this EPR Addendum prior to Project implementation;
- Review and confirm all permits and approvals throughout detailed design and prior to Project construction as described in Section 6 of this EPR Addendum. Secure all required permits/approvals prior to Project implementation;
- Implement all mitigation measures as documented in this EPR Addendum prior to the construction and operations/maintenance phases and throughout the detailed design phase of the Project, as appropriate;
- Ensure that all mitigation measures are captured in the Construction Contract Documents and are implemented by the Contractor;
- All construction activities will be monitored by a qualified Environmental Inspector who will review the effectiveness of the mitigation measures and construction Best Management Practices (BMPs) to confirm they are functioning as intended. The Environmental Inspector will regularly monitor that all activities are conducted in accordance with mitigation plans and all work is conducted from within the specified work zones; and
- Post construction monitoring activities and timing will be confirmed based on the terms and conditions outlined in the required permits/approvals secured prior to the Project construction process.

ES 4.8 Section 8 – References

This section lists all referenced reports, guidelines, standards and other documents used in the preparation of the EPR Addendum.

ES 4.9 TPAP Supporting Studies

A number of studies were conducted and Technical Reports prepared for each GO Station in support of the TPAP and are included as appendices to this EPR Addendum. These reports provide additional, discipline-specific details, and include:

- Appendix A: Initial Preferred Design (Spadina-Front GO Station) or Preferred Design (Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations);
- Appendix B: Natural Environment Report;
- Appendix C: Tree Inventory Plan;
- Appendix D: Stage 1 Archaeological Assessment;
- Appendix E: Cultural Heritage Studies;
- Appendix F: Socio-Economic and Land Use Study;
- Appendix G: Air Quality Impact Assessment;
- Appendix H: Noise and Vibration Impact Assessment; and
- Appendix I: Transportation and Traffic Impact Analysis (Transportation Brief only for Spadina-Front GO Station).

This EPR Addendum is organized into volumes as listed below:

Volume 1: EPR Addendum (including Stakeholder Consultation Report as Appendix A)

Volume 2: Spadina-Front GO Station Design and Technical Studies (Appendix A to Appendix I)

Volume 3: Bloor-Lansdowne GO Station Design and Technical Studies (Appendix A to Appendix I)

Volume 4: Kirby GO Station Design and Technical Studies (Appendix A to Appendix I)

Volume 5: Mulock GO Station Design and Technical Studies (Appendix A to Appendix I)

Volume 6: Innisfil GO Station Design and Technical Studies (Appendix A to Appendix I).

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Glossary of Terms and Acronyms

4T	4Transit, a joint venture of Hatch, Parsons and WSP
AA	Archaeological Assessment
AAQC	Ambient Air Quality Criteria
ADOS	Accessible Drop-Off Spaces
A.M.	Morning
ANSI	Area of Natural and Scientific Interest
AREMA	American Railway Engineering and Maintenance-of-Way Association
ASI	Archaeological Services Inc. Archaeological and Cultural Heritage Services
ATRIS	Aboriginal and Treaty Rights Information System
AQIA	Air Quality Impact Assessment
B(a)P	Benzo(a)pyrene
BHA	Butternut Health Assessment
BHR	Built Heritage Resource
BMP	Best Management Practice
BRCE	Barrie Rail Corridor Expansion
BRT	Bus Rapid Transit
Burnside	R.J. Burnside & Associates Limited
CAC	Criteria Air Contaminant
CB	Catch Basin
CEAA	*Canadian Environmental Assessment Act*, 2012
CFIA	Canadian Food Inspection Agency
CGL	Cultural Green Land
CHAR	Cultural Heritage Assessment Report
CHER	Cultural Heritage Evaluation Report
CHL	Cultural Heritage Landscape
CHP	Conditional Heritage Property
CHR	Cultural Heritage Resource
CHSR	Cultural Heritage Screening Report

Glossary of Terms and Acronyms

CHVI	Cultural Heritage Value or Interest
CNR	Canadian National Railway
CO	Carbon Monoxide
CO_{2eq}	Carbon Dioxide Equivalents
COC	Contaminant of Concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COSSARO	Committee on the Status of Species at Risk in Ontario
CPR	Canadian Pacific Railway
CPTED	Crime Prevention Through Environmental Design
CRA Fishery	Commercial, Recreational, or Aboriginal Fishery
CTC	Credit Valley, Toronto and Region, and Central Lake Ontario
CTMP	Construction Traffic Management Plan
CUM	Cultural Meadow
CUM1	Mineral Cultural Meadow
CUM1-1	Dry-Moist-Old Field Meadow
CUP	Cultural Plantation
CUT1	Mineral Cultural Thicket
CVC_1	Business Sector
CUW	Cultural Woodland
CUW1	Mineral Cultural Woodland
DBH	Diameter at Breast Height
DDRGS	Davenport Diamond Rail Grade Separation
DFO	Fisheries and Oceans Canada
DRM	Design Requirement Manual
DMP	Dust Management Plan
EA	Environmental Assessment
EAA	*Environmental Assessment Act*, 1990
EAPB	Environmental Assessment and Permissions Branch

Glossary of Terms and Acronyms

EASR	Environmental Activity and Sector Registry
ECA	Environmental Compliance Approval
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification
EMMP	Environmental Mitigation and Monitoring Plan
EPA	*Environmental Protection Act*, 1990
EPR	Environmental Project Report
ESA	*Endangered Species Act*, 2007
ESC	Erosion and Sediment Control
FOD	Deciduous Forest
Frequency of Vibration	The number of times that a periodically occurring quantity repeats itself in a specified period. With reference to noise and vibration signals, the number of cycles per second.
FTA	Federal Transit Administration
GGH	Greater Golden Horseshoe
GGHACA	Greater Golden Horseshoe Area Conservation Authorities
Greenbelt Plan	Approved in 2017 as an amendment to the Greenbelt Plan established under Section 3 of the *Greenbelt Act,* 2005, to protect important lands around the Golden Horseshoe. It is a cornerstone of Ontario's Growth Plan for the Greater Golden Horseshoe.
GHG	Greenhouse Gas
GPGGH	Growth Plan for the Greater Golden Horseshoe, 2017. Growth Plan for the Greater Golden Horseshoe created under the *Places to Grow Act* (2005). It is an overarching strategy that provides clarity and certainty about urban structure, where and how future growth should be accommodated, and what must be protected for current and future generations.
GTHA	Greater Toronto and Hamilton Area
HCM	Highway Capacity Manual
HIA	Heritage Impact Assessment
HVAC	Heating, Ventilation, and Air Conditioning
HWIN	Hazardous Waste Information Network
IAG	Intensive Agriculture

Glossary of Terms and Acronyms

IBC	Initial Business Case
IDF	Intensity Duration Frequency
IPD	Initial Preferred Design
IPPC	Intergovernmental Panel on Climate Change
ISA	International Society of Arboriculture
KHF	Key Hydrologic Feature
KNHF	Key Natural Heritage Feature
LEED	Leadership in Energy and Environmental Design
L_{eq}	Equivalent Continuous Noise Level
LID	Low Impact Development
LIO	Land Information Ontario
LOS	Level of Service
LPAT	Local Planning Appeal Tribunal. The Ontario Municipal Board (OMB) became the LPAT on April 3, 2018.
LRT	Light Rail Transit
LSPP	Lake Simcoe Protection Plan
LSRCA	Lake Simcoe Region Conservation Authority
MAM	Meadow Marsh
MAS	Shallow Marsh
MBCA	*Migratory Birds Convention Act*, 1994
MCR	Municipal Comprehensive Review
MESP	Master Environmental Servicing Plan Guideline
MMA	Ontario Ministry of Municipal Affairs
MNRF	Ministry of Natural Resources and Forestry.
MOE/MOEE/MOECC	Ministry of the Environment/Ministry of the Environment and Energy/Ministry of the Environment and Climate Change. The Ministry of the Environment (MOE) was created in 1972 and merged with the Ministry of Energy to form the Ministry of Environment and Energy (MOEE) from 1993 to 1997 and again in 2002. The Ministry of the Environment (MOE) changed its name to the Ministry of the Environment and Climate Change (MOECC) on June 24, 2014. Thus, MOE, MOEE and MOECC are considered to be synonymous for the purposes of this Report.

Glossary of Terms and Acronyms

MOECC/GO Draft Protocol	"MOEE/GO Transit Draft Protocol for Noise and Vibration Assessment", January 1995
MOL	Ministry of Labour
MP	Member of Parliament
MPIR	Ministry of Public Infrastructure Renewal
MPP	Member of Provincial Parliament
MTCS	Ministry of Tourism, Culture and Sport
MTO	Ministry of Transportation of Ontario
MUP	Multi-Use Path
NAG	Non-Intensive Agriculture
NAPS	National Air Pollution Surveillance
NER	Natural Environment Report
NHIC	Natural Heritage Information Centre
NMRP	North Maple Regional Park
NO	Nitric Oxide
NO_x	Nitrogen Oxides
NO_2	Nitrogen Dioxide
NSA	Noise Sensitive Area. Land over which users are sensitive to noise. Also referred to as Noise Sensitive Land use (Ontario Ministry of the Environment, 2013) that accommodates a residential dwelling, a building for commercial use, or a building for institutional use where occupants can be considered to be noise sensitive. Noise sensitive also considers vibration sensitive herein.
NVIA	Noise and Vibration Impact Assessment
NVNCTMP	North Vaughan and New Communities Transportation Master Plan
O_3	Ozone
OAR	Open Aquatic River
OASD	Ontario Archaeologists Sites Database
OBBA	Atlas of the Breeding Birds of Ontario
OCS	Overhead Contact System
OGS	Ontario Geological Survey
OHA	*Ontario Heritage Act, 1990*

Glossary of Terms and Acronyms

OHSA	*Occupational Health and Safety Act*, 1990
OLS	Ontario Land Survey
OMB	Ontario Municipal Board
OP	An Official Plan describes an upper, lower or single-tier municipal council's policies on how land within their respective jurisdiction should be used. The Official Plan typically identifies where new industry, housing, offices and shops will be located and how, and in what order, parts of the community will grow, among other issues.
OPA	Official Plan Amendment
OPSS	Ontario Provincial Standard Specification
O. Reg.	Ontario Regulation
ORM	Oak Ridges Moraine
ORMCA	*Oak Ridge Moraine Conservation Act*, 2001
ORMCP	Oak Ridges Moraine Conservation Plan, 2017. Ecologically based plan established by the Ontario government to provide land use and resource management direction for the 190,000 hectares of land and water within the Moraine.
OWRA	*Ontario Water Resources Act*,1990
P.A.	Public Announcement
PA	*Planning Act*, 1990
PAH	Polycyclic Aromatic Hydrocarbon
PDBC	Preliminary Design Business Case
Peak Hour	Hour during the Peak Period with the highest ridership
Peak Period	3 Hour Period in A.M. or P.M. with the highest ridership
PHP	Provincial Heritage Property
P.M.	Afternoon
$PM_{2.5}$	Particulate Matter less than 2.5µm
PM_{10}	Inhalable Particulate Matter
PPS	Provincial Policy Statement 2014 - The statement of the government's policies on land use planning
POI	Point of Impingement
POR	Point of Reception

Glossary of Terms and Acronyms

PPUDO	Passenger Pick-Up and Drop-Off
PPV	Peak Particle Velocity
PSW	Provincially Significant Wetland
PTE	Permission to Enter
PTTW	Permit to Take Water
RCD	Reference Concept Design
RER	Regional Express Rail
RMS	Root-Mean-Square Velocity
RNFP	Ravine and Natural Feature Protection
ROW	Right-of-Way
RTP	Regional Transportation Plan
S&G	Standards and Guidelines for Consultant Archaeologists
SAR	Species at Risk
SARA	*Species at Risk Act*, 2002
SARO	Species at Risk in Ontario
SCC	Species of Conservation Concern
SELUS	Socio-Economic and Land Use Study
SMP	Soil Management Plan
S-Rank	NatureServe Conservation Status System Ranking Designated at a Subnational Level
SWH	Significant Wildlife Habitat
SWHTG	Significant Wildlife Habitat Technical Guide
SWM	Stormwater Management[1]
SWS	Switching Station
The Big Move	A long-range transportation plan created by Metrolinx for the Greater Toronto and Hamilton Area
TAC	Technical Advisory Committee
TBD	To be Determined
TIP	Tree Inventory Plan

Glossary of Terms and Acronyms

TIS	Traffic Impact Study
TLA	This Land Archaeology Inc.
TLI	Temporary Limited Interest
TDM	Transportation Demand Management
TMC	Turning Movement Count
TMP	Transportation Master Plan
TPAP	Transit Project Assessment Process
TPS	Traction Power Substation
TPZ	Tree Protection Zone
TRCA	Toronto and Region Conservation Authority
TSP	Total Suspended Particles
TTC	Toronto Transit Commission
TTIA	Transportation and Traffic Impact Analysis
Uber	Uber Technologies Inc.
UNESCO	United Nations Educational, Scientific and Cultural Organization
Vacant Lot	Property within a Noise Sensitive Area, with no current resident; however, the property currently has a scheduled proposed dwelling or a current zoning for a potential future dwelling.
V/C	Volume-to-Capacity
Vibration	An oscillation wherein the quantity is a parameter that defines the motion of a mechanical system.
VOC	Volatile Organic Compound
VOP 2010	City of Vaughan Official Plan
VPR	Voluntary Project Review
WHPA	Wellhead Protection Area
WHPA-D	Wellhead Protection Area – Zone D. The area in which the time of travel to the well is up to and including 25 years
WHPA-Q	Wellhead Protection Area – Water Quantity
WTRP	West Toronto Railpath
WWFMG	Wet Weather Flow Management Guidelines

Glossary of Terms and Acronyms

WWFMP	Wet Water Flow Master Plan
YRT	York Region Transit
ZOI	Zone of Influence

[1]*Under the ELC System for Southern Ontario (Lee, et. al., 1998), SWM also refers to a mixed swamp vegetation community.*

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Appendix I: Transportation and Traffic Impact Analysis

1. Introduction

Regional Express Rail (RER) is Metrolinx's program to significantly increase rail service across the GO rail network. This expanded service will provide improved travel choices on the GO rail network, including two-way, all day service on five GO corridors, with electrified service in core areas. RER includes:

- Electric trains running every 15 minutes or better, all day in both directions, within the most heavily travelled sections of the network;
- Four times the number of trips outside of weekday rush-hour periods, including evenings and weekends; and
- Twice the number of trips during weekday rush-hour periods.

Sixty-six GO Stations currently serve thousands of customers daily throughout the Greater Golden Horseshoe (GGH). With work already underway to build a connected transit network that supports more frequent, electric, uninterrupted service, Metrolinx is looking at a number of locations for potential new stations.

As part of the RER program, 12 new stations are being added to the GO Transit network, which will support the expansion of the regional rail system and enhance integration with local and municipal transit services, as well as local active transportation infrastructure. Five of the 12 new stations are planned along the Barrie rail corridor and include the Spadina-Front, Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations (see Figure 1-1).

Assessment of the proposed new GO Stations ("the Project") is being carried out in accordance with the Transit Project Assessment Process (TPAP). The TPAP is regulated by the *Environmental Assessment Act* (EAA) under *Ontario Regulation 231/08: Transit Projects and Metrolinx Undertakings* (O. Reg. 231/08). An Environmental Project Report (EPR) (dated August 2017) was prepared for the Barrie Rail Corridor Expansion (BRCE) Project in accordance with O. Reg. 231/08 that documented the TPAP for rail infrastructure improvements in the vicinity of the proposed GO Stations. The BRCE EPR received Notice to Proceed on October 5, 2017.

The BRCE EPR stated that the five proposed GO Stations along the Barrie rail corridor would be subject to a future addendum, and did not assess the potential environmental effects of the GO Stations. As a result, inclusion of the five GO Stations represents a change to the BRCE Project that is inconsistent with the above-noted EPR. As such, an EPR Addendum is required to document the public consultation efforts for the GO Stations in collaboration with the local municipalities, and to document the potential environmental effects associated with the GO Stations.

Metrolinx has retained 4Transit (4T), a joint venture of Hatch, Parsons and WSP, to undertake the EPR Addendum under the the TPAP for the five proposed GO Stations. This EPR Addendum documents the TPAP for the Project and has been prepared in accordance with the

Ministry of the Environment and Climate Change[2] (MOECC) Guide to Ontario's TPAP (MOE, 2014). This EPR Addendum outlines the TPAP followed for the GO Stations, and is defined as the BRCE Project EPR Addendum – New GO Stations.

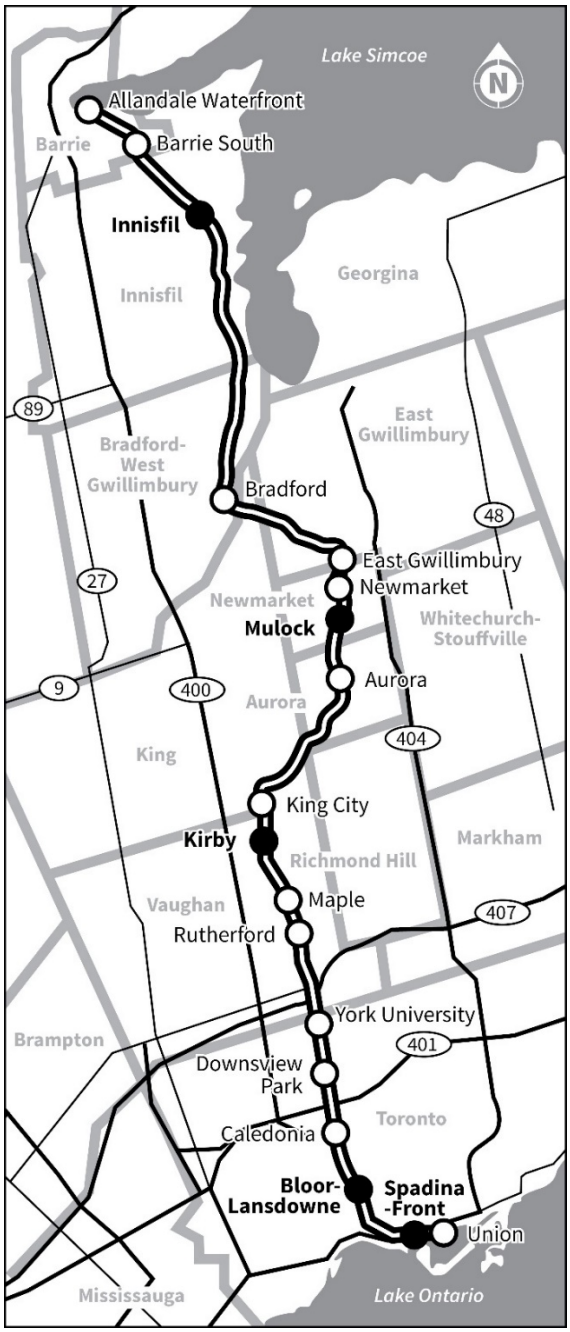


Figure 1-1: Location of Five GO Stations Along Barrie Rail Corridor

[2] *The Ministry of the Environment and Climate Change (MOECC) changed its name to Ministry of the Environment, Conservation and Parks (MECP) on June 29, 2018. Given the schedule for finalization and printing of the EPR Addendum, the name change for this ministry has not been reflected throughout the EPR Addendum.*

1.1 Project Overview

1.1.1 The New GO Stations

The five GO Stations being proposed along the Barrie rail corridor include Spadina-Front GO Station (located in the City of Toronto), Bloor-Lansdowne GO Station (located in the City of Toronto), Kirby GO Station (located in the City of Vaughan), Mulock GO Station (located in the Town of Newmarket) and Innisfil GO Station (located in the Town of Innisfil). The Preferred Designs (or Initial Preferred Design (IPD) for Spadina-Front GO Station) for the GO Stations and other features are more fully described in Section 2. The general locations of the GO Stations are presented in Figure 1-1, however more detailed figures are included in Section 1.4.

Spadina-Front GO Station

The Spadina-Front GO Station will be located at the intersection of Front Street West and Spadina Avenue, and approximately 200 metres east of the intersection of Front Street West and Bathurst Street, with access from Front Street West and Spadina Avenue in the City of Toronto. The Spadina-Front GO Station will provide a stop between Union Station and the proposed Bloor-Lansdowne GO Station.

Components of the Spadina-Front GO Station are:

- Two station access structures including a main station;
- A station building to the north of the rail corridor;
- One island platform;
- Two rail tracks through the station;
- Two pedestrian tunnels providing access to the platforms from Spadina Avenue and Front Street West;
- One bicycle parking area;
- An accessible lay-by; and
- New sidewalk along the south side of Front Street West between Spadina Avenue and Puente de Luz Bridge.

The main GO Station access supports connectivity to the future below grade PATH tunnels at the Well development proposal (immediately north of the GO Station site). The western end of the platform protects for a potential future vertical access connection to future development above the corridor proposed by others.

This study was based upon the IPD prepared for Spadina-Front GO Station (October 2017) as provided in Volume 2 - Appendix A of this BRCE EPR Addendum.

Bloor-Lansdowne GO Station

The Bloor-Lansdowne GO Station will be located approximately 200 metres west of the intersection of Bloor Street West and Lansdowne Avenue, with access from both sides of the

Barrie rail corridor in the City of Toronto. The Bloor-Lansdowne GO Station will provide a stop between the proposed Spadina-Front GO Station and the planned Caledonia GO Station.

Components of the Bloor-Lansdowne GO Station are:

- Three station access structures including one main station building to the east of the rail corridor;
- Two side platforms;
- Two rail tracks through the station, plus a gauntlet track;
- Possible modification or replacement of the existing Bloor Street West rail overpass bridge;
- Two pedestrian tunnels providing access to the platforms from Bloor Street West, Sterling Road and Dora Avenue;
- Three bicycle parking areas;
- An accessible lay-by connecting to St Helens Avenue;
- A ramp and stairs east of the rail corridor and north of Bloor Street West to provide access down to the north sidewalk;
- Improved/expanded sidewalk along Wade Avenue, providing a pedestrian link between the station and the Lansdowne Subway Station;
- A Multi Use Path (MUP), running parallel to the rail corridor on the east side, and extending from the station site to south of Dundas Street West;
- A MUP bridge over Bloor Street West to the east of the rail overpass bridge to provide a connection between Davenport Diamond Rail Grade Separation (DDRGS) Greenway and the GO Station; and
- A MUP bridge over Davenport Road onto Earlscourt Park, located approximately two kilometres (km) north of the station site.

The primary GO Station entrance building will be visible from Bloor Street West. This entrance is contained in a two-storey building that provides convenient walk-up and elevator access for pedestrians. The building's upper level connects to a proposed new access road off of St Helens Avenue, as well as the accessible lay-by, bicycle facilities, MUP and the eastern (northbound) platform.

This MUP provides active transportation connectivity to the West Toronto Railpath (WTRP) extension south of Dundas Street, Dundas Street West/St Helens Avenue, the Greenway along the DDRGS north of the GO Station, the Lansdowne TTC Station through the connection at Wade Avenue, and Bloor Street West. The bridge to Earlscourt Park provides active transportation connectivity from the DDRGS to Earlscourt Park.

This study was based upon the Preferred Design prepared for the Bloor-Lansdowne GO Station (March 2018), as provided in Volume 3 - Appendix A of this BRCE EPR Addendum.

Kirby GO Station

The Kirby GO Station will be located south of Kirby Road approximately 300 metres west of Keele Street, with access from both sides of the Barrie rail corridor in the City of Vaughan. The Kirby GO Station will provide a stop between the Maple GO Station and the King City GO Station.

Components of the Kirby GO Station are:

- Three station access structures including a main station building to the east of the rail corridor and secondary station entrances east and west of the rail corridor;
- Two side platforms;
- Three rail tracks through the station, including a centre express track and two gauntlet tracks;
- Two pedestrian tunnels providing access across the corridor;
- Three bicycle parking areas;
- A bus loop;
- A passenger pick-up and drop-off (PPUDO) area;
- A 1,000-space surface parking lot;
- Three non-signalized vehicular access points (two off of Keele Street and one off of Kirby Road). The north Keele Street access point will include dedicated bus lanes, vehicular lanes and pedestrian and cyclist access; and
- Multi-Use Path (MUP) connection to the planned TransCanada MUP trail south of the station.

This study was based upon the Preferred Design prepared for the Kirby GO Station (April 2018), as shown in Volume 4 - Appendix A of this BRCE EPR Addendum.

Mulock GO Station

The Mulock GO Station will be located on the south side of Mulock Drive, west of Steven Court, in the Town of Newmarket. The Mulock GO Station will be situated approximately 600 metres east of Cane Parkway and 400 metres west of Bayview Avenue, on both sides of the Barrie rail corridor. The new Mulock GO Station will provide a stop between the Aurora GO Station and the Newmarket GO Station.

Components of the Mulock GO Station are:

- Two station access structures including a main station building to the east of the rail corridor;
- Two side platforms;
- Three rail tracks through the station, including a centre express track and two gauntlet tracks;

- One pedestrian tunnel;
- Three bicycle parking areas;
- A pedestrian connection to one bus lay-by along the south side of Mulock Drive;
- A PPUDO area;
- A 700-space surface parking lot;
- Two access roads to the east of the station: one in the north that connects to Steven Court, and a second in the south that extends past Steven Court to connect to the existing Bayview Avenue/Carberry Street intersection, which includes vehicular lanes, pedestrian and cyclist access; and
- Modifications to the Steven Court/Kent Drive intersection at Mulock Drive to add vehicular turning lanes.

This study was based upon the Preferred Design prepared for the Mulock GO Station (April 2018), as provided in Volume 5 - Appendix A of this BRCE EPR Addendum.

Innisfil GO Station

The Innisfil GO Station will be located on 6th Line, approximately 800 metres east of 20 Sideroad, and approximately 800 metres south of 7th Line, with access from both sides of the Barrie rail corridor in the Town of Innisfil. The Innisfil GO Station will provide a stop between the Barrie South GO Station and the Bradford GO Station.

Components of the Innisfil GO Station are:

- Two station access structures including a main station building to the west of the rail corridor;
- Two side platforms;
- Three rail tracks though the station, including a centre express track and two gauntlet tracks;
- One pedestrian tunnel providing access across the corridor to future development to the east of the station site;
- Three bicycle parking areas;
- A bus loop;
- A PPUDO area;
- A 500-space surface parking lot, with primary vehicle access from 6th Line; and
- A primary vehicular access from a signalized intersection with 6th Line, which includes vehicular lanes, pedestrian and cyclist access.

This study was based upon the Preferred Design prepared for the Innisfil GO Station (April 2018), as provided in Volume 6 – Appendix A of this BRCE EPR Addendum.

1.1.2 Barrie Rail Corridor Overview

The Barrie rail corridor is owned by Metrolinx, who operates a commuter (passenger) rail service between Union Station (Mile 0.00) in the City of Toronto, and the Allandale Waterfront GO Station (Mile 63.00) in the City of Barrie. Oriented generally in a north/south direction, the existing rail corridor is primarily a single track, approximately 63 miles in length and has 11 stations (excluding Union Station). One station is currently planned prior to construction (Caledonia) along the rail corridor. The rail corridor traverses eleven upper- and lower-tier municipalities, including, from south to north: the City of Toronto, Regional Municipality of York (hereafter referred to as York Region), City of Vaughan, Township of King, Town of Aurora, Town of Newmarket, Town of East Gwillimbury, County of Simcoe, Town of Bradford West Gwillimbury, Town of Innisfil, and City of Barrie.

Trains are currently stored overnight at the Barrie Layover Facility located between Mile 62.17 and Mile 62.84 in the City of Barrie. GO Bus service is available for off-peak hours at all GO Stations along the Barrie rail corridor except the York University GO Station in the City of Toronto. There are also infrequent Canadian National Railway (CNR) freight and VIA Rail services operating along the Barrie rail corridor. At the time of writing (November 2017), commuter rail service along the Barrie rail corridor comprised the following:

Weekday Service:

- Eight southbound trains travelling from the Allandale Waterfront GO Station to Union Station in the A.M. peak period (arriving at Union Station between 6:30 A.M. and 9:30 A.M.). The headway, or the time between successive trains on the route, is between 15 and 30 minutes;
- Eight northbound trains travelling from Union Station to the Allandale Waterfront GO Station in the P.M. peak period (departing Union Station between 3:40 P.M. and 6:45 P.M.). The headway for these trains is approximately 30 minutes; and
- Bus service is also provided to most GO Stations along the Barrie rail corridor.

Weekend Service:

- As of December 31, 2016, year-round weekend GO train service has been offered throughout the day on Saturdays, Sundays and holidays. Three southbound trains run from the Allandale Waterfront GO Station to Union Station in the morning, and seven additional southbound trains run from the Aurora GO Station to Union Station throughout the day, creating approximately 75 minute headways. Six northbound trains run from Union Station to the Aurora GO Station, and three additional northbound trains run from Union Station to the Allandale Waterfront GO Station; and
- GO Bus service between Barrie and Newmarket is also provided to meet train service at the Aurora, East Gwillimbury, and Maple GO Stations.

1.2 Planning Context and Other Projects

1.2.1 Metrolinx 2041 Regional Transportation Plan

In accordance with the *Metrolinx Act* (2006), the Province of Ontario created Metrolinx to develop, fund, coordinate and promote a multi-modal transportation network within the GTHA

municipalities. Metrolinx developed the first Regional Transportation Plan (RTP) for the GTHA, entitled “The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area”, which outlined long-term transportation goals and objectives, including an integrated transportation network with specific focus on public transit. The RTP was adopted in 2008 by the Metrolinx Board and provided a 25-year vision for sustainable transportation in the GTHA. Under The Big Move, eight major transit projects were implemented across the GTHA and are at the completion stage, while a further 16 transit projects are in the engineering or construction stages (Metrolinx, 2008).

Building upon the success of The Big Move, Metrolinx has released the 2041 Draft RTP which considers the increasing population and employment in the GTHA, and outlines policies to increase capacity of the regional transportation system, while considering the changing nature of demographics, employment, transportation technologies and climate. The final RTP will be published following more refined technical work and feedback from municipal partners, stakeholders and the public (Metrolinx, 2017a). The 2041 Draft RTP is based on five key Strategies, including:

- Successfully completing and delivering on-going regional transit projects with RER being a major project, and identified in the 2041 Draft RTP as a focus of *Moving Ontario Forward* that includes service improvements to all seven existing GO corridors;
- Increasing connectivity of frequent rapid transit within the region, which will also involve further expansions to the RER program beyond 2025, other surface transit systems like Bus Rapid Transit (BRT) and Light Rail Transit (LRT) systems and the subway network;
- Optimizing the transportation system through initiatives such as fare integration, providing first- and last-mile solutions, and enhancing barrier-free access to multi-modal transportation options;
- Integrating land use and transportation through regulatory measures that encourage the planning of communities and road networks to support transit and active transportation; and
- Preparing for an uncertain future to provide a provincial framework for the evaluation and regulation of emerging transportation technologies and innovative solutions for resilient infrastructure.

Priority Actions are provided under each of the above five Strategies to achieve the vision and goals of the Draft 2041 RTP. The Strategies and Priority Actions were developed through research and input from municipal planning professionals, stakeholders from across the region and GTHA residents. These Priority Actions are intended to enable the implementation of the 2041 Draft RTP and to meet its goals, which include increasing the reach of frequent rapid transit to a larger share of the GTHA population. As per the 2041 Draft RTP, 36 percent of the population and 46 percent of employment are to be located within walking distance of the Frequent Rapid Transit Network (i.e., 400 metres from Priority Bus, BRT and LRT lines, and 800 metres from the subway network and GO Stations with 15-minute service frequency) (Metrolinx, 2017a).

Implementation of the GO Stations will align directly with the 2041 Draft RTP's Strategies and Priority Actions for increased frequent transit connectivity within the region. It is expected to support the service expansions on the Barrie rail corridor and the development of a transit and active transportation-supportive community surrounding the GO Stations.

1.2.2 Regional Express Rail

As noted previously, RER is Metrolinx's 10-Year Program to bring more train trips to every GO rail corridor to move people across the Greater Toronto and Hamilton Area (GTHA) faster and more easily, so that people will have more ways to connect to the things that matter. The RER service levels are shown in Figure 1-2. There are currently 66 GO Stations that serve Metrolinx's customers daily throughout the GTHA. With work already underway to build a connected transit network that supports more frequent, electric, uninterrupted service, Metrolinx is looking at a number of locations for potential new stations.

Metrolinx initially identified over 120 potential new station sites across the GTHA. These potential sites were scored based on strategic and technical feasibility criteria and subsequently narrowed to approximately 50 locations. The approximately 50 locations were subsequently evaluated based on strategic, economic, technical/operational and cost/revenue considerations to identify 24 sites to be advanced for further analysis. An Initial Business Case (IBC) was undertaken for each of the 24 shortlisted sites to refine the evaluation and determine which sites to carry forward for further consideration. From this process, 12 new stations, including the five GO Stations, were recommended to be included in the GO RER 10-Year Program. This process is described in further detail in Sections 1.2.5, Section 1.2.6 and 1.2.7 and of this EPR Addendum.

In 2017 (Spadina-Front GO Station) and 2018 (Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations), the designs of the five proposed GO Stations were refined to develop a Preferred Design (IPD for Spadina-Front GO Station) for each GO Station. The Preferred Designs represents the design upon which the TPAP has been conducted. The Preferred Designs are described in further detail in Section 2 of this EPR Addendum.

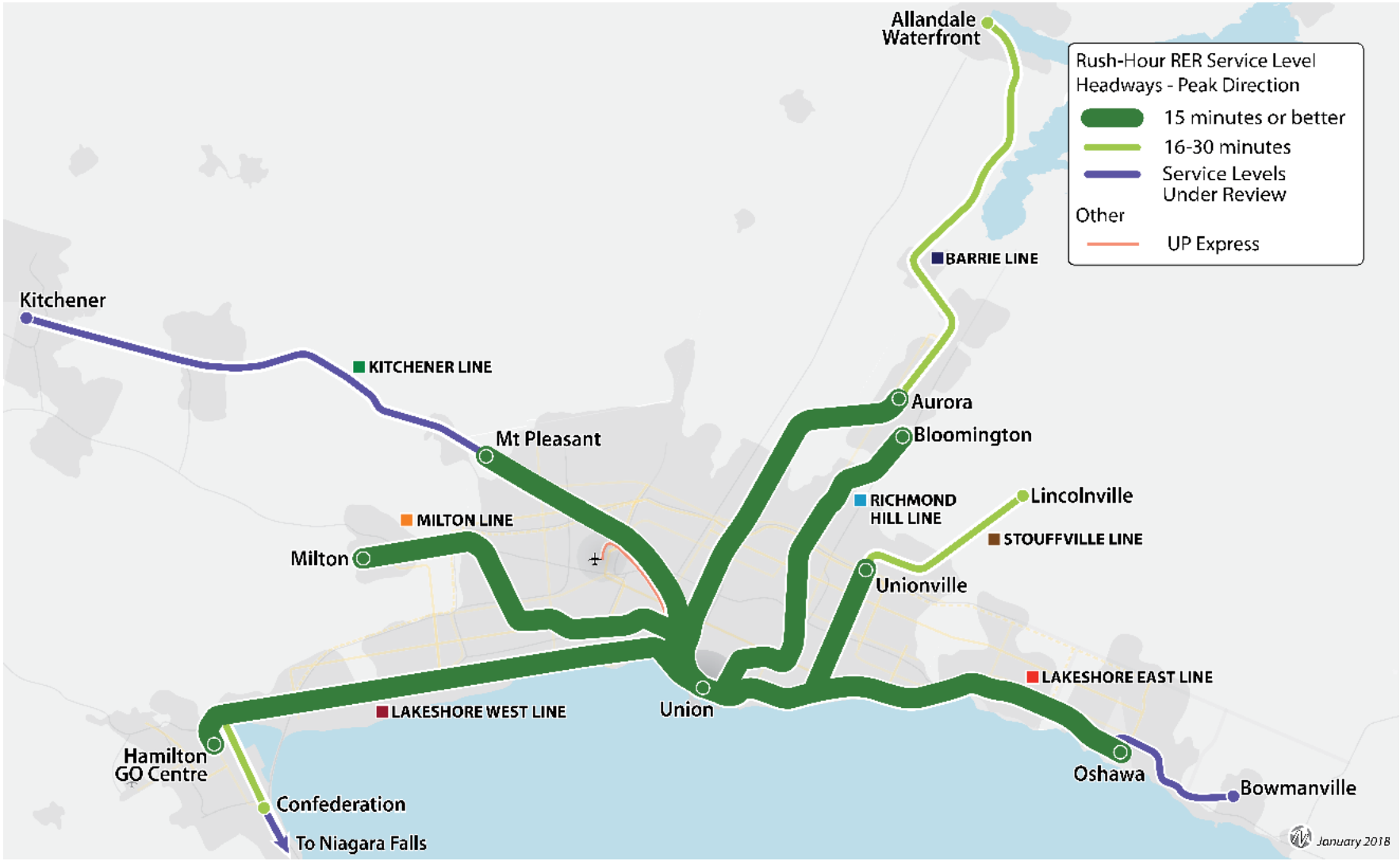


Figure 1-2: RER Service Levels

1.2.3 *Metrolinx New Station Evaluation Process*

As shown in Figure 1-3, the new station evaluation process undertaken by Metrolinx involved six key stages:

- Stage 1: Identify an initial list of over 120 potential station sites using key site and network considerations (2015);
- Stage 2: Focus analysis on-site factors, service considerations and historical requests – list reduced to over 50 sites (2015);
- Stage 3: Evaluate and analyze strategic, economic, technical/operational and cost/revenue considerations of over 50 sites (fall 2015 to spring 2016);
- Stage 4: Engage with municipalities, the public and other key stakeholders to obtain feedback on over 50 sites (fall 2015 through winter 2016);
- Stage 5: Refine the list to 17 clusters of comparative sites (24 sites in total) based on an evaluation framework (spring 2016); and
- Stage 6: Conduct a more detailed IBC analysis on the 17 site clusters (spring 2016). Recommendations for the new stations were made to the Metrolinx Board of Directors in June 2016.

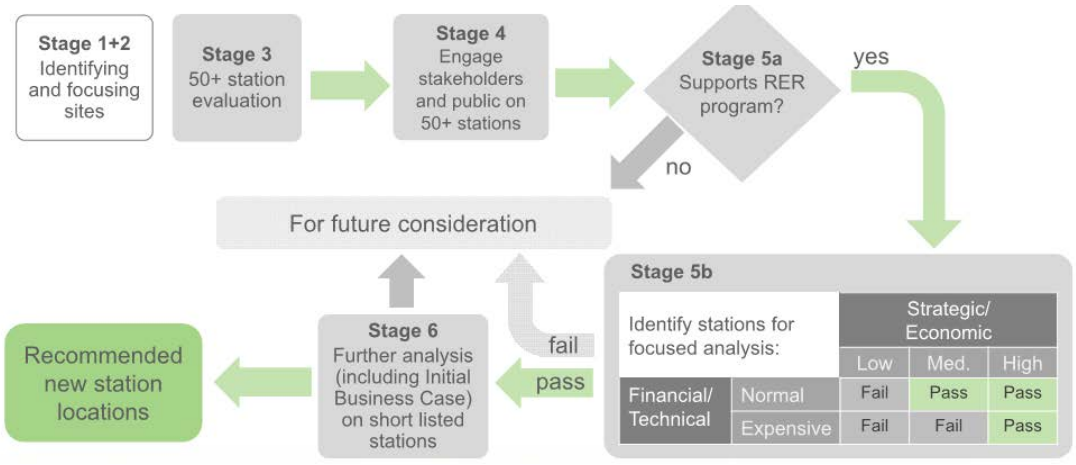


Figure 1-3: New Station Evaluation Process

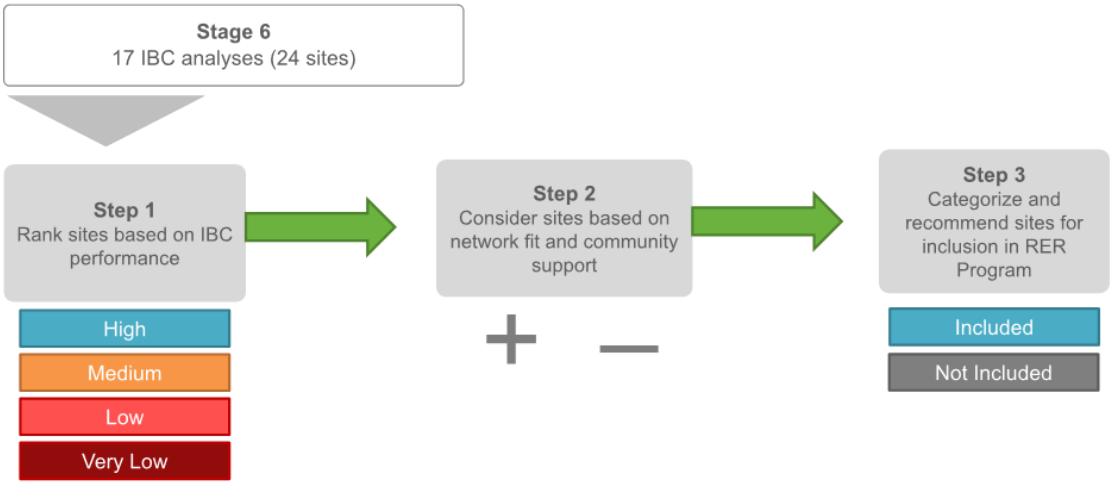
1.2.4 *GO Regional Express Rail 10-Year Program: New Stations Analysis*

On June 28, 2016, the GO RER 10-Year Program: New Stations Analysis Report was submitted to the Metrolinx Board of Directors (Metrolinx, 2016a). The Report outlined the consultation process followed to obtain feedback on the list of over 50 sites. Municipal staff were consulted in the fall of 2015 and early 2016. Input was sought from the public through a series of consultations, including 19 regional Open Houses attended by almost 2,000 members of the public. In concurrence with the Open Houses, Metrolinx ran a website (MetrolinxEngage.com) which had over 4,000 visitors between February 16 and April 4, 2016, with over 200 comments posted. The feedback obtained from municipalities and the public was used to inform the preliminary evaluation and refinement of the sites taken forward for further consideration in Stages 5 and 6.

Common themes received through public feedback were as follows:

- Go above and beyond minimum noise and vibration mitigation requirements;
- Separate at-grade crossings;
- Consider the effects that providing additional local service will have on the regional service Metrolinx is mandated to provide;
- Proactively communicate with communities on all aspects of the projects (from construction all the way through until there is increased service);
- Integrate GO service with local transit service;
- Ensure the service remains affordable to all who use it;
- Create conditions for replacement trees to thrive;
- Include diverse and native species in replacement trees;
- Ensure noise, vibration, and tree removal compensation is locally applied;
- Review and revise outdated policy and strengthen the procurement process; and
- Be open to alternative types of technology for trains on the rail corridor.

In Stage 5, station sites were analyzed based on 38 measures, including key criteria relating to: Connectivity and Ridership; Travel Time Savings; Market Potential; Development Potential; Policy Alignment; Affordability; and Ease of Construction. Locations that were not taken forward to Stage 6 generally did not perform well with respect to one or more of the following considerations: construction costs or challenges; lack of travel time savings; lack of nearby destinations (i.e., employment, retail or institutional); constrained development potential; lack of supportive land uses to facilitate transit use; or the absence of major new infrastructure to facilitate station construction. In Stage 6, the IBC process was undertaken to develop a list of recommended sites. This process is summarized in Figure 1-4.



Source: Metrolinx, 2016a

Figure 1-4: Initial Business Case Process

The IBCs informed a relative ranking of the proposed sites based on key sensitivities relating to Strategic, Financial, Economic, Deliverability/Operational and Magnitude of Effect. Four rankings were generated from this assessment: High, Medium, Low and Very Low. A prioritization of individual sites within their specific GO rail corridors was then undertaken in accordance with their connections to rapid transit, support from the wider community, effect on opportunities for future stations, and spacing in relation to other existing or proposed stations to promote minimized travel time effects. Ultimately, the IBC process identified the 12 recommended stations shown in Table 1-1.

Table 1-1: Recommended Stations[1]

GO Rail Corridor	Recommended Stations
Barrie	• Spadina (now known as Spadina-Front) • Bloor-Davenport (now known as Bloor-Lansdowne) • Kirby • Mulock • Innisfil
Kitchener	• Liberty Village (now known as King-Liberty) • St. Clair West (now known as St. Clair-Old Weston) • Breslau
Lakeshore East	• Don Yard/Unilever (now known as East Harbour and also located on the Stouffville corridor) • Gerrard (now known as Gerrard-Carlaw and also located on the Stouffville corridor)
Stouffville	• Don Yard/Unilever (now known as East Harbour and also located on the Lakeshore East corridor) • Gerrard (now known as Gerrard-Carlaw and also located on the Lakeshore East corridor) • Lawrence East (now known as Lawrence-Kennedy) • Finch (now known as Finch-Kennedy)

[1]Station names will be developed via Metrolinx's station naming approach. The names in this document are working names and are subject to change.

1.2.5 Project Background and Initial Business Case

1.2.5.1 Spadina-Front GO Station

In July 2016, Metrolinx issued the IBC for the Spadina-Front GO Station, titled RER New Stations Initial Business Case – Spadina – Barrie Corridor (Urban Strategies Incorporated, 2016a).

Following the IBC, the Spadina-Front GO Station was recommended by the Metrolinx Board of Directors on June 28, 2016. In fall 2016, the City of Toronto confirmed the location, general design concept and support for station. As the station would serve the Barrie Corridor only, it was not considered part of the Smart Track program, which is focused on Stouffville and Kitchener service. The Metrolinx Board committed to include the station as part of the GO Expansion RER program on December 8, 2016. Through 2017, Metrolinx engaged with the City and internal stakeholders to refine the IBC Spadina-Front GO Station concept plan. Metrolinx worked closely with the City to develop the design based on ongoing operational needs assessment, pre-Environmental Assessment (EA) studies, workshops, discussion, and a Technical Advisory Committee (TAC) process.

Since the IBC concept illustration (2016), the Spadina-Front GO Station design has been modified to reflect the input received from these various inputs.

1.2.5.2 Bloor-Lansdowne GO Station

In July 2016, Metrolinx issued the IBC for the Bloor-Lansdowne GO Station, titled *RER New Stations Initial Business Case – Downtown West, Liberty Village, Queen-Dufferin, Lansdowne Cluster Screening – Kitchener/Barrie Corridors* (Urban Strategies Incorporated, 2016b).

Following the IBC evaluation in spring 2016, the Bloor-Lansdowne GO Station was recommended by the Metrolinx Board of Directors on June 28, 2016. In fall 2016, the City of Toronto confirmed the location, general design concept and support for station. The Metrolinx Board committed to include the station as part of the GO Expansion RER program procurement on December 8, 2016. Through 2017, Metrolinx engaged with the City and internal stakeholders to refine the IBC station concept plan. Metrolinx worked closely with the City to develop the design based on ongoing operational needs assessment, pre-EA studies, workshops, discussion, and a TAC process.

Since the IBC concept illustration (2016), the Bloor-Lansdowne GO Station design has been modified to reflect the input received from these various inputs.

1.2.5.3 Kirby GO Station

In July 2016, Metrolinx issued the IBC for the Kirby GO Station, titled *RER New Stations Initial Business Case – Kirby – Barrie Corridor* (IBI Group, 2016a).

Following the IBC, the Kirby GO Station was recommended by the Metrolinx Board of Directors on June 28, 2016. The City of Vaughan and Region of York confirmed the location and general design concept on November 15, 2016. The Metrolinx Board committed to include the station as part of the GO Expansion RER program procurement on December 8, 2016. Through 2017, station design development has progressed based on pre-EA work, workshops, discussion, and a TAC process with stakeholders.

Since the IBC concept illustration (2016), the Kirby GO Station design has been modified to reflect the input received from these various inputs.

1.2.5.4 Mulock GO Station

In July 2016, Metrolinx issued the IBC for the Mulock GO Station, titled RER New Stations Initial Business Case – Mulock – Barrie Corridor (IBI Group, 2016b).

Following the IBC evaluation in Spring 2016, the Mulock GO Station was recommended by the Metrolinx Board of Directors on June 28, 2016. The Town of Newmarket confirmed the location and general design concept on October 24, 2016. The Metrolinx Board committed to include the station as part of the GO Expansion RER program procurement on December 8, 2016. During the spring of 2017, Metrolinx engaged with the Town of Newmarket and internal stakeholders to refine the IBC Mulock GO Station concept plan. Since then, station design development has progressed based on pre-EA work, workshops, discussion, and TAC process with stakeholders. Design changes are ongoing in coordination with stakeholders.

Since the IBC concept illustration (2016), the Mulock GO Station design has been modified to reflect the input received from these various inputs.

1.2.5.5 Innisfil GO Station

In July 2016, Metrolinx issued the IBC for the Innisfil GO Station, titled *RER New Stations Initial Business Case – Innisfil – Barrie Corridor* (IBI Group, 2016c).

Following the IBC, the Innisfil GO Station was recommended by the Metrolinx Board of Directors on June 28, 2016 for inclusion in the GO Expansion RER program subject to confirmation by the Town of Innisfil's concurrence on the location and general design concept. This was received on October 19, 2016. The Metrolinx Board committed to include the Innisfil GO Station as part of the GO Expansion RER program procurement on December 8, 2016. Through 2017, Metrolinx engaged with the Town of Innisfil and internal stakeholders to refine the Innisfil GO Station concept plan. Since then, station design development has progressed based on pre-EA work, workshops, discussion, and a TAC process with stakeholders. Since the IBC concept illustration (2016), the Innisfil GO Station design has been modified to reflect the input received from these various inputs.

1.2.6 Preliminary Design Business Cases

In March 2018, Metrolinx issued the Preliminary Design Business Case (PDBC) for the Project within Appendix I of the New Stations Initial Business Cases Technical Report (Metrolinx, 2018a). The PDBC takes the IBC results and refines them with more detailed costing and analysis of benefits. The PDBC analysis captures evolved design concepts, revised modelling methodology, changes in municipal and provincial plans, and updated operating patterns and service plans since 2016. The findings of the PDBC for the new GO Stations are summarized in Table 1-2.

Table 1-2: Financial and Economic Case – New GO Stations

	Spadina-Front	Bloor-Lansdowne	Kirby	Mulock	Innisfil
2031 Ridership (A.M. Peak Period) boardings + alightings	10,200	2,200	3,800	1,500	1,000
2031 Ridership (Daily) boardings + alightings	39,300	8,500	10,600	4,200	2,800
Change in Cost from IBC	Increase	Increase	Increase	Decrease	Increase
Change in Benefits from IBC	Increase	Increase	Increase	Decrease	Decrease
Benefits Compared to Cost	Benefits are Positive and Exceed Costs	Benefits are Positive but Less Than Costs	Benefits are Positive and Exceed Costs	Benefits are Negative due to Network Impacts	Benefits are Positive and Exceed Costs
Transportation User Benefits (60yr lifecycle)	$1,300 M	$11 M	$437 M	-$131 M	$214 M

	Spadina-Front	Bloor-Lansdowne	Kirby	Mulock	Innisfil
Travel Time Savings	$1,366 M	-$4 M	$293 M	-$139 M	-$16 M
Vehicle Operating Cost Savings	-$51 M	$12 M	$108 M	$6 M	$173 M
Decongestion on Road Network	-$9 M	$2 M	$22 M	$1 M	$36 M
Safety Impacts	-$5 M	$1 M	$11 M	$1 M	$18 M
Environmental Impacts	-$1 M	$0 M	$1 M	$0 M	$2 M

1.2.6.1 Spadina-Front GO Station

The Spadina-Front GO Station continues to conform with current provincial, regional and local transportation and land use policy. Due to its location in a designated Urban Growth Centre and within Toronto's dense Downtown and Central Waterfront, the area has and will continue to intensify with residential and employment growth due to strong market demand.

Since the IBC, the Toronto City Council voted in favour of planning for a decking structure, the Rail Deck Park, which would be located above the Spadina-Front GO station. A private application for development over the rail corridor was submitted for the same location without Toronto City Council support currently. Any overbuild land uses could be expected to reinforce the site as a destination and contribute to ridership. The PDBC modelling assumed the existing land use designation.

Ridership forecasts indicate that the Spadina-Front GO Station would attract approximately 39,300 daily riders by 2031. The total includes new and existing riders, who would now use this station rather than another, such as Union Station. The model results indicate that the Spadina-Front GO Station would generate a relatively small number of new GO riders in comparison to its high overall ridership. The majority of trips forecasted at the Spadina-Front GO Station in the A.M. peak period are comprised of alighting riders; the station is located in the immediate vicinity of both existing and future employment hubs. The employment that drives ridership is either already in place or part of in-progress development. Spadina-Front GO Station access would primarily be via walking and local transit.

1.2.6.2 Bloor-Lansdowne GO Station

The Bloor-Lansdowne GO Station continues to align with municipal and regional land use and transportation policies and is supported by the Toronto Official Plan (City of Toronto, 2015) and the Dundas West Gateway Hub (Metrolinx, 2011). Since June 2016 no significant changes to land use in the surrounding area have been identified.

The Bloor-Lansdowne GO Station continues to facilitate integration between the GO and TTC networks. A future at-grade connection to the Lansdowne TTC station is planned as part of the station and there is an opportunity for the future development fronting Bloor Street West between the rail corridor and Lansdowne Avenue to provide a higher-quality pedestrian link to Lansdowne subway station. A high-quality connection to Wade Avenue is proposed planned as part of the station's opening day condition (see Section 2.4.7), and a setback area along

Wade Avenue to improve MUP/GO Station connectivity and visibility is being investigated through the design of the station.

Boardings at the station are expected to primarily use walking and transit access modes. Many of the recommendations in the 2016 GO Rail and Station Access Plan for walk and cycle access call for close collaboration with the City of Toronto, which is being undertaken as part of the TAC process. A new pedestrian bridge over Davenport Road to Earlscourt Park would provide connectivity to potential future trails at the park site.

The model's ridership forecasts indicate that the Bloor-Lansdowne GO Station could attract approximately 8,500 daily riders by 2031. The total includes new and existing riders that would switch from other stations on the Barrie rail corridor, or the Bloor GO Station on the Kitchener rail corridor.

The model also shows that the majority of forecasted trips would be inbound Barrie rail corridor riders that transfer to the Lansdowne TTC station and continue their journey on the Bloor-Danforth (Line 2) subway. A high-quality connection between these stations, as is planned, station will have an impact on the attractiveness of the transfer. The Bloor-Lansdowne GO Station would also provide a new outbound connection to the Barrie rail corridor, allowing Toronto residents to connect to employment locations in York Region.

1.2.6.3 Kirby GO Station

A GO Station at Kirby continues to conform to provincial, regional and local planning policy. Work is in progress on the Block 27 Secondary Plan and the Kirby GO Transit Hub Sub-Study (initiated in April 2016). Work is also progressing on the North Vaughan and New Communities Transportation Master Plan (NVNCTMP) which is looking at planning for a well-integrated and sustainable transportation network in north Vaughan for 2031 and beyond.

York Region is undertaking its Municipal Comprehensive Review (MCR), which will include updated density targets. Increases to density will depend on an expanded transit and transportation network, with a GO station at Kirby being considered as an integral part of the East Vaughan Transportation Grid, which is intended to underpin the City's land use planning to 2041.

The identification of Provincially Significant Wetlands (PSW) in the vicinity of the proposed Kirby GO Station site limits the land available for development and will require new analysis as to the potential density and land uses in the area remaining after construction of station facilities.

The intent of City policy is to create a community focus for northeast Vaughan that is transit supportive and pedestrian friendly.

1.2.6.4 Mulock GO Station

The Mulock GO Station conforms broadly to transportation and planning policies. The Town of Newmarket is about to undertake a Secondary Planning exercise, which will review density and connectivity in the station area. The Employment Use nature of the area is expected to remain. The Town of Newmarket is participating in York Region's MCR process which will provide guidance on local intensification targets, and possible land use changes for the Town of

Newmarket's existing employment areas, which may influence the Mulock GO Station area. The MCR is expected to come into effect in 2020.

There are no major developments or intensification plans approved that would suggest an increase to the existing density. This density does not meet Metrolinx's Mobility Hub Guidelines' suggested minimum density for regional or express rail, and is below the target identified in the Growth Plan for the Greater Golden Horseshoe (GPGGH) for a priority transit corridor.

Ridership forecasts indicate that the Mulock GO Station would attract approximately 4,200 daily riders by 2031. The total includes new and existing GO riders, who would now use this station rather than another such as Aurora and Newmarket GO Stations. A new rider at the station would have previously used their automobile or taken transit to reach their destination. Approximately 75 percent of riders are expected to access the station via drive-and-park, and via some walk-in and transit access users from surrounding areas located between Leslie Street and Yonge Street. The Town of Newmarket is undertaking an Active Transportation Plan which will include recommendations for access improvements to GO Stations in Newmarket.

1.2.6.5 Innisfil GO Station

The anticipated future density for the area is in alignment with the density targets for Regional Rail in the Metrolinx Mobility Hub Guidelines, predicated on the build out of the Alcona South Secondary Plan. The Town of Innisfil Transportation Master Plan (TMP) includes consideration of Metrolinx's GO Expansion RER program, fixed-route transit options in the Town of Innisfil which currently do not exist, and traffic management measures that could further improve station access (HDR Inc., 2018).

The Innisfil GO Station will be accessible by cycling, walking, and PPUDO including on-demand transit, which is currently operating in the Town of Innisfil through a partnership with Uber Technologies Inc. (Uber). Most users are expected to drive-and-park. The Innisfil GO Station is was also being designed to accommodate future fixed route transit. Improving walking and cycling access to the station will require involve further collaboration with the Town of Innisfil to improve active transportation connections to the station site.

Ridership forecasts indicate that Innisfil GO Station would attract approximately 2,800 daily riders in 2031. The total ridership includes new and existing riders, who would now use this station rather than another such as the Barrie South or Bradford GO Stations. The majority of trips forecasted to use the Innisfil GO Station in the A.M. peak period are comprised of boarding riders, travelling from their residence to the station to another destination, primarily to Toronto.

1.2.7 Full Business Cases

As part of Metrolinx's business case analysis approach, Metrolinx staff are currently developing full business cases for all the potential new GO Stations sites that underwent a PDBC in March 2018. At the time of writing, the results of these business cases were not yet available.

1.3 Purpose of the Transit Project

1.3.1 Support of Regional Express Rail

The five GO Stations are considered by Metrolinx to be critical to improve local access to higher order rapid transit. Specifically, the GO Stations support improved network connectivity, provide improved access to higher order transit for residents and facilitate transit-oriented

development and local community building. Providing additional stops along the Barrie rail corridor will play a key role in supporting the wider RER program through increased ridership and a reduction in congestion on roads and highways in the GGH.

1.3.2 Barrie Corridor Rail Service Expansion

In August 2017, Metrolinx completed an EPR for the BRCE Project for the Barrie rail corridor from Union Station in the City of Toronto to the Allandale Waterfront GO Station in the City of Barrie. The study examined the infrastructure needs to expand service along the corridor and identified appropriate improvements to enhance the quality of service and provide new transit options. This included installation of a second track between Lansdowne Avenue in the City of Toronto and the Allandale Waterfront GO Station in the City of Barrie, associated upgrades to existing GO Stations, and a layover facility in the Town of Bradford-West Gwillimbury. The study stated that five GO Stations (now called Spadina-Front, Bloor-Lansdowne, Kirby, Mulock and Innisfil) would be subject to a future EPR Addendum.

Since the completion of the BRCE EPR, implementation of the proposed improvements has commenced. The introduction of new rail infrastructure along the Barrie rail corridor coupled with the GO Stations together support the RER initiative.

1.4 Description of the GO Station Study Areas

The GO Station study areas include the GO Station footprint (or development area) and a one km buffer around the GO Station footprint boundary. Figure 1-5, Figure 1-6, Figure 1-7, Figure 1-8 and Figure 1-9 present each of the five GO Station study areas for this EPR Addendum.

The proposed Project footprints represent the area where property is required to carry out all physical works and activities either directly for infrastructure or for associated GO Station uses (i.e., parking, tunnels or pedestrian access, and laydown areas). The one km buffer area has been added as it is recognized that some impacts (or effects) may be experienced outside the Project footprint. This buffer area represents an area where effects associated with Project construction and/or operation are likely to occur, such as the off-site migration of dust and noise. Collectively, these areas represent the geographic range over which the potential impacts (or effects) associated with the Project could occur.

The study area represents the geographic area within which the required technical studies were completed in support of this EPR Addendum. For each technical study, the study area varies based upon the subject matter being studied (see Table 1-3), and is based on the varying range within which potential effects are likely to occur. The rationale for each discipline specific study area is presented in Section 3 of this EPR Addendum.

Table 1-3: Study Area by Technical Study

Study	Study Area
Natural Environment Report (NER)[1]	Project footprint with a 120 m buffer.
Tree Inventory Plan (TIP)	Project footprint with a 6 m buffer[2].
Stage 1 Archaeological Assessment (AA)	Project footprint with a 50 m buffer.
Cultural Heritage Screening Report (CHSR)	Project footprint with a 50 m buffer.

Study	Study Area
Socio-Economic and Land Use Study (SELUS)	Project footprint with a 500 m buffer.
Air Quality Impact Assessment (AQIA)	Project footprint with a 300 m (adjacent to GO Station footprint) to 1 km (along rail corridor) buffer. Specific receptors outlined in Section 3.9.
Noise and Vibration Impact Assessment (NVIA)	Project footprint with a 300 m buffer. Specific receptors outlined in Section 3.10.
Transportation and Traffic Impact Analysis (TTIA)	The nearest signalized intersections outlined in Section 3.12.

[1] The NER study area for the Kirby GO Station was expanded to the west, beyond 120 metres, to ensure the entirety of the PSW and Significant Woodland fell within the study area

[2]For Ravine and Natural Features Protection (RNFP) areas, the Bloor-Lansdowne study area is defined as the Project footprint plus a 12 metre buffer in accordance with the applicable City of Toronto Tree Protection By-law(s).

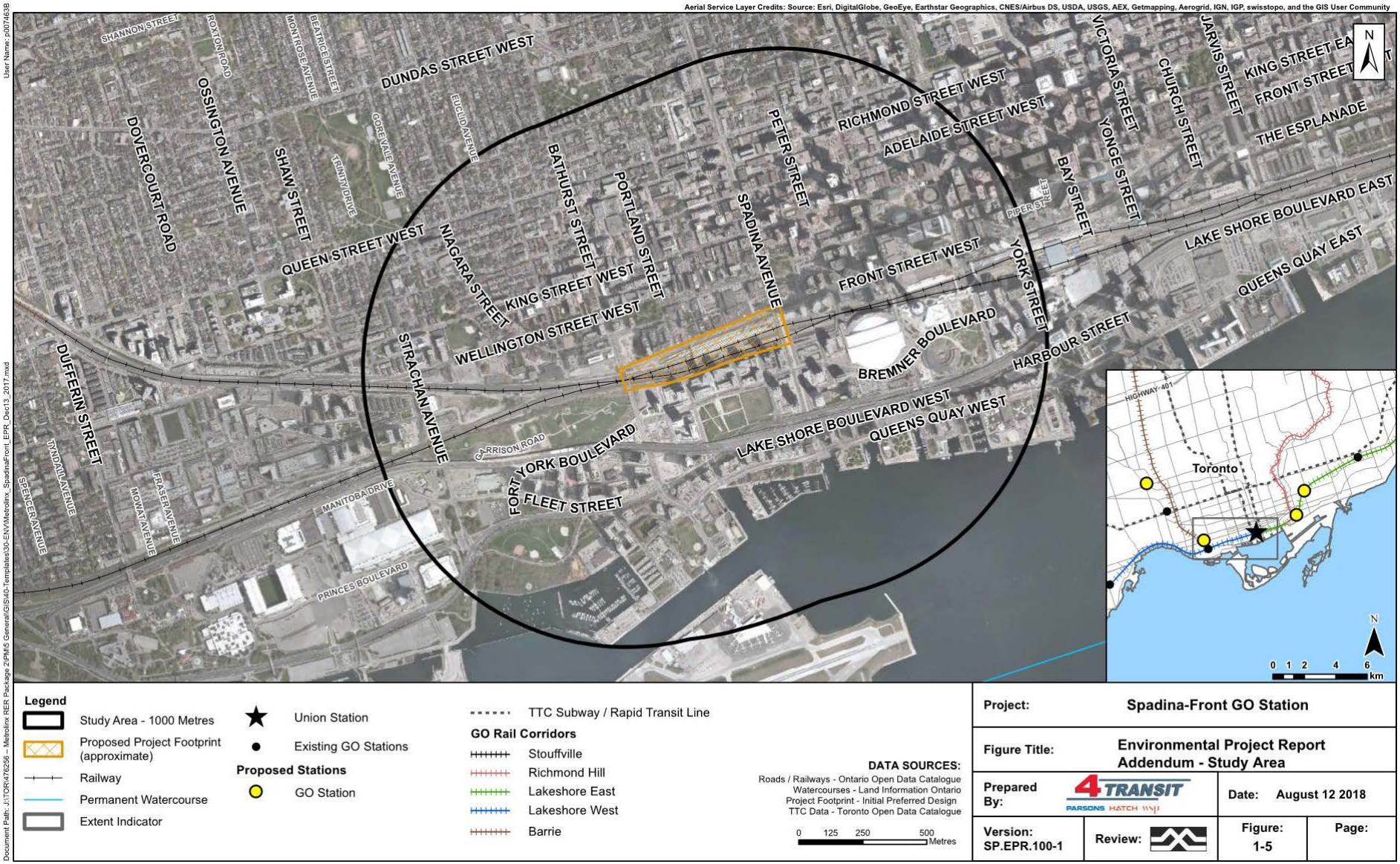


Figure 1-5: Spadina-Front GO Station Study Area

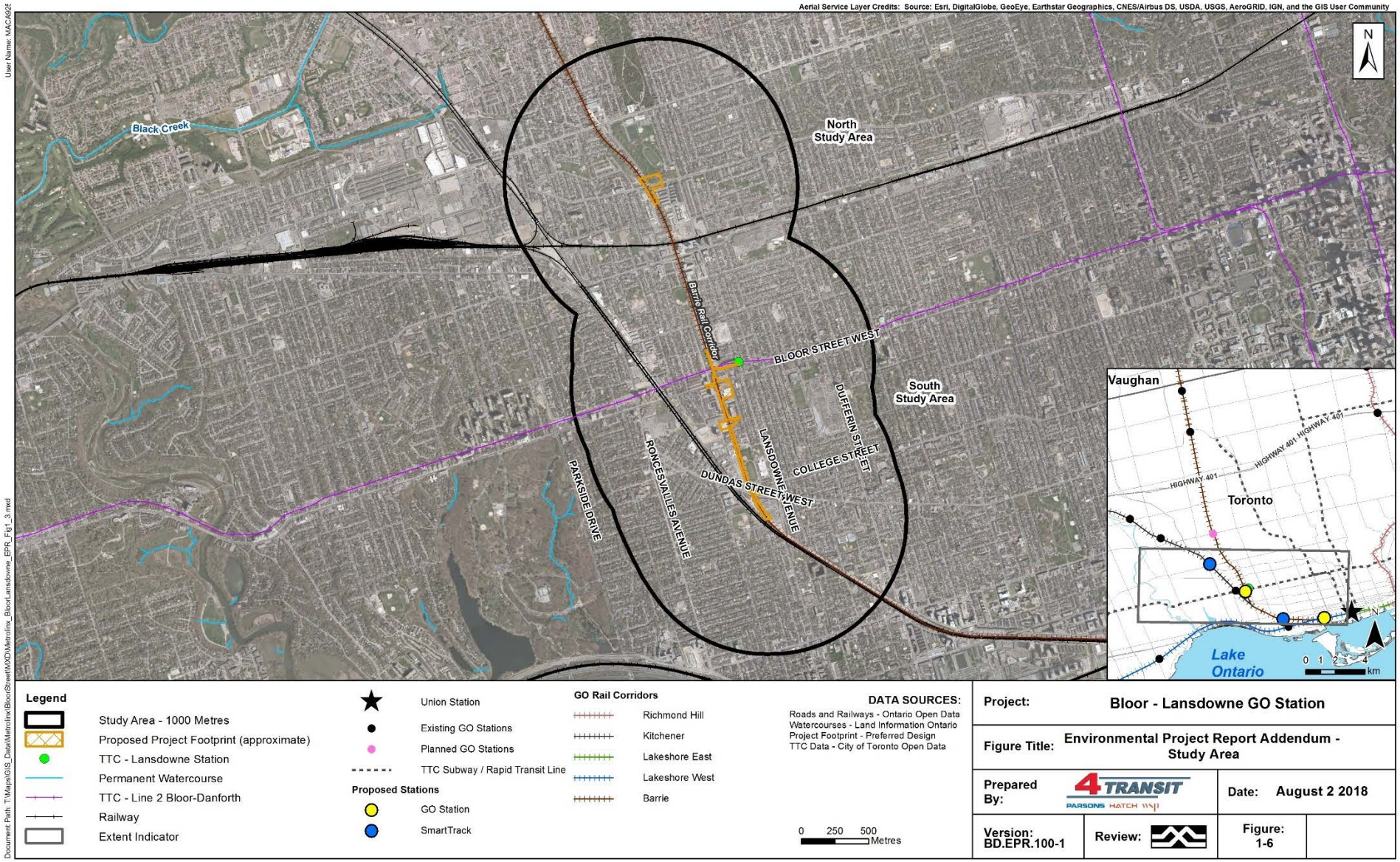


Figure 1-6: Bloor-Lansdowne GO Station Study Area

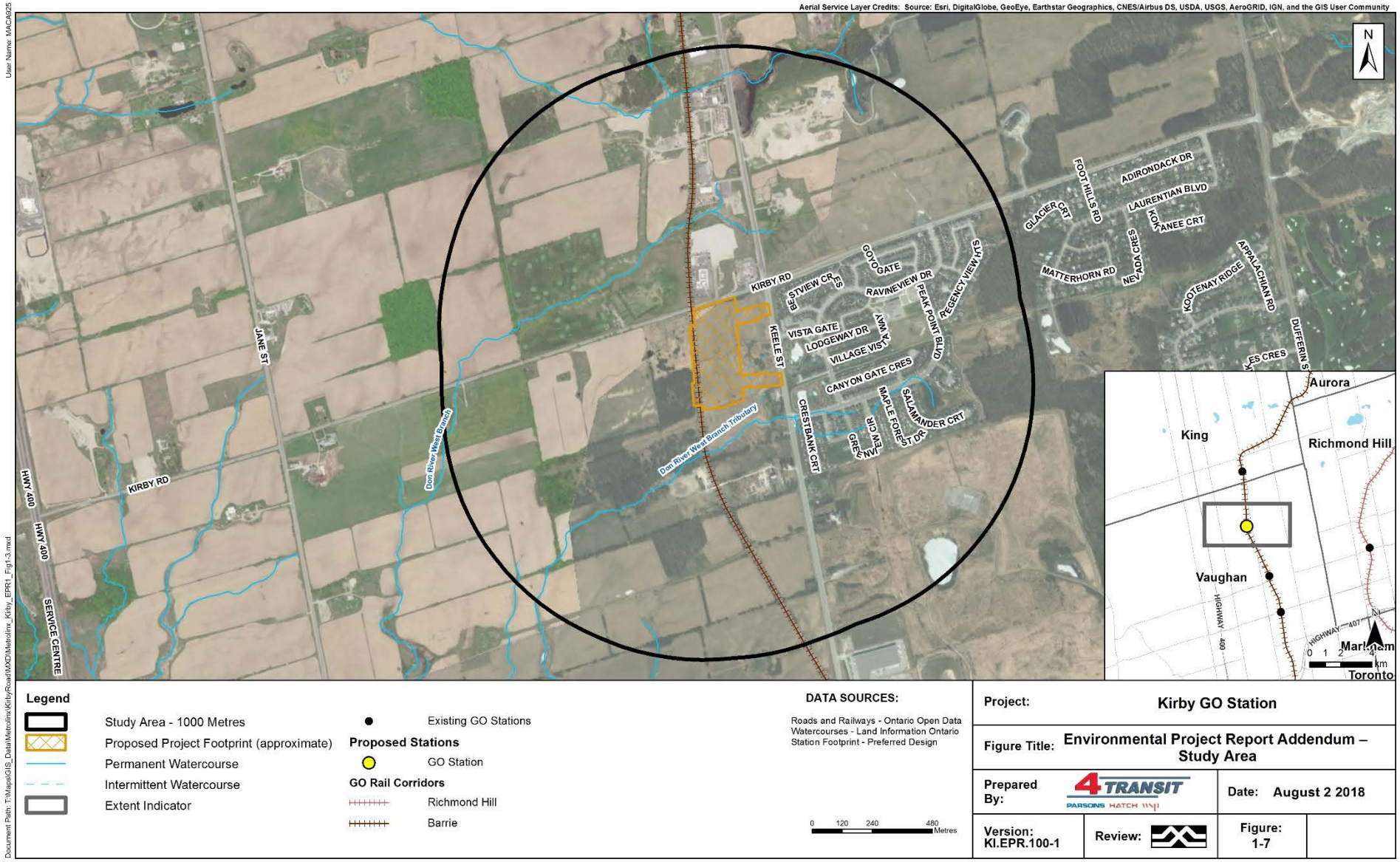


Figure 1-7: Kirby GO Station Study Area

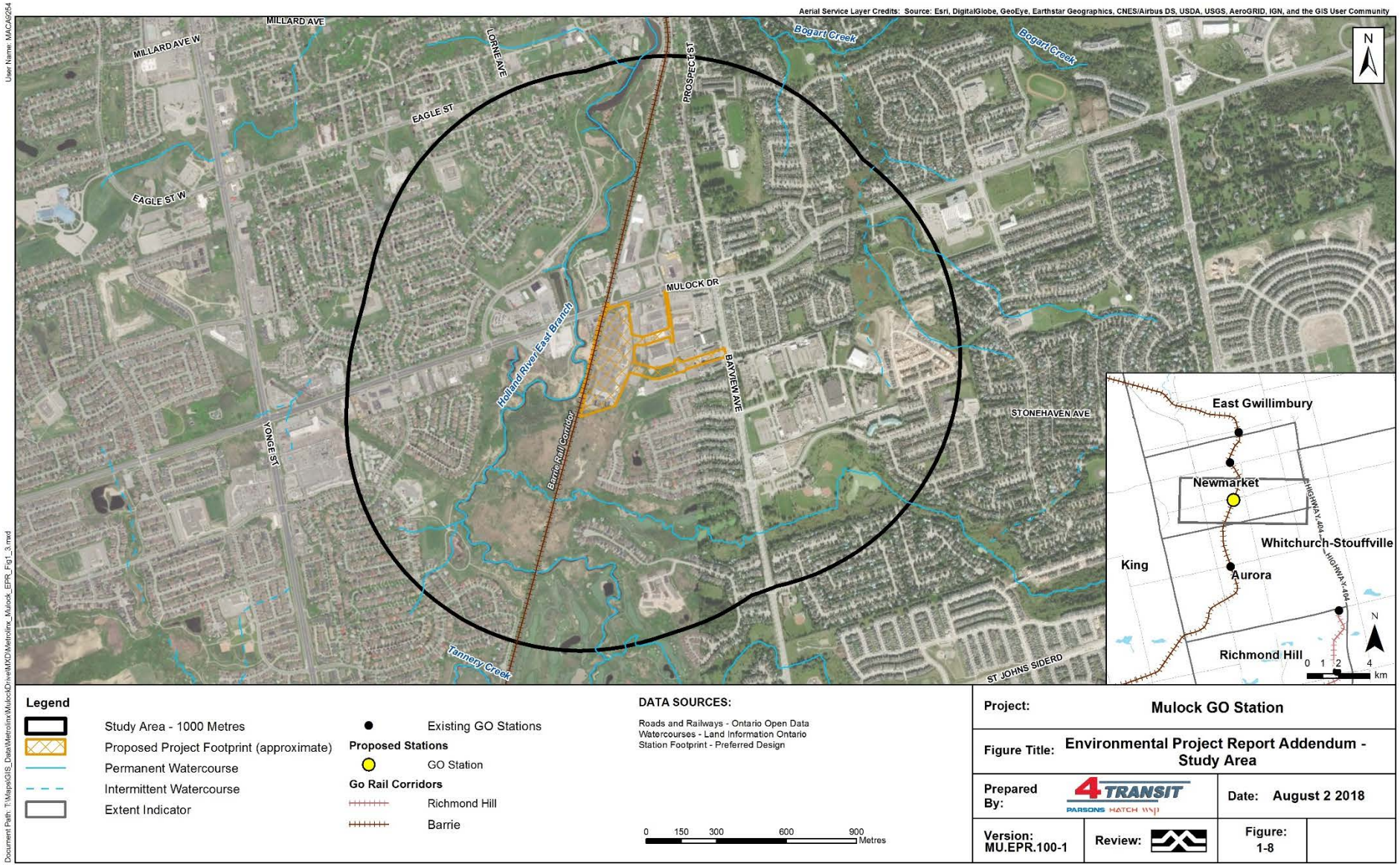


Figure 1-8: Mulock GO Station Study Area

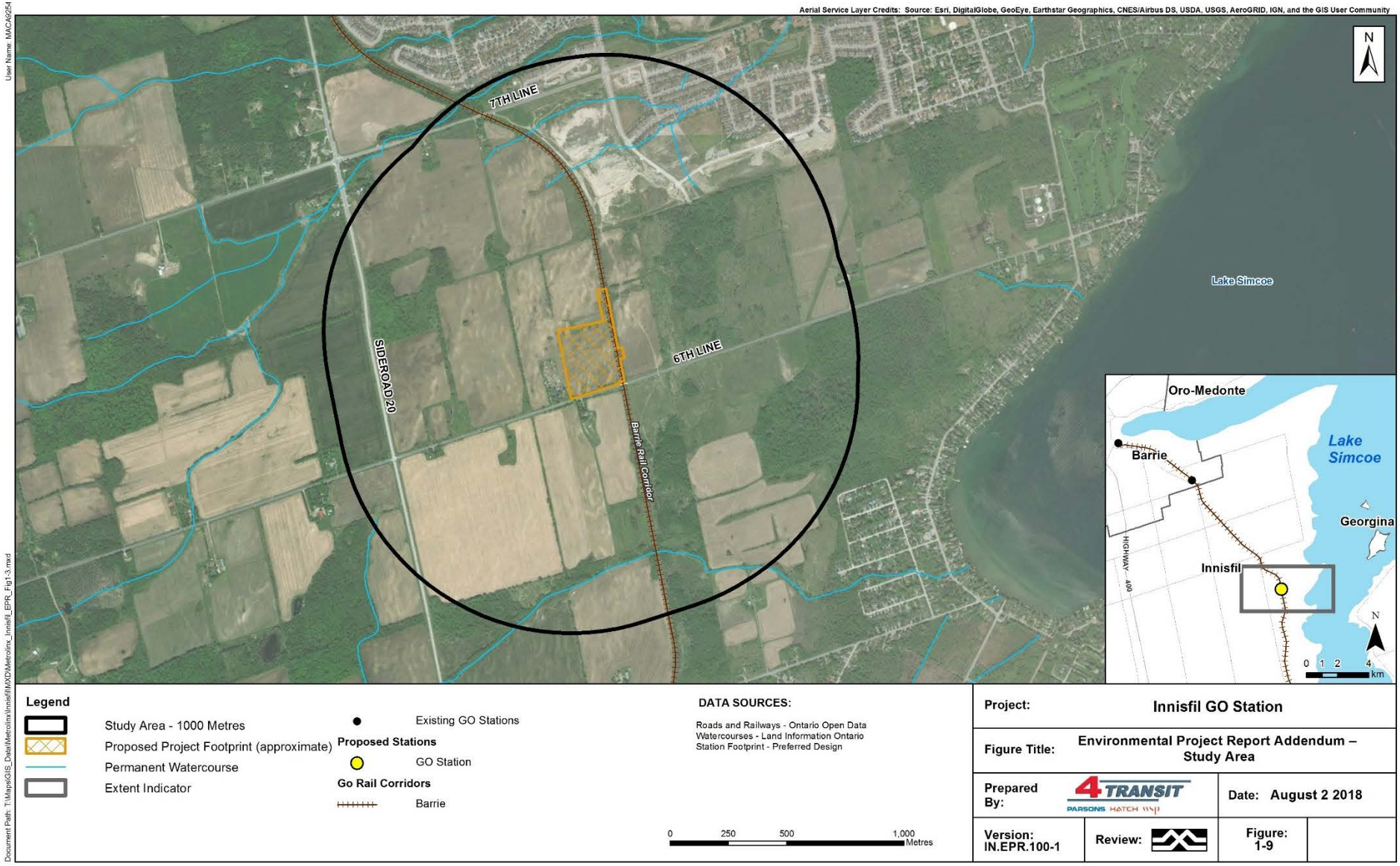


Figure 1-9: Innisfil GO Station Study Area

1.5 Transit Project Assessment Process

1.5.1 Project Proponent

The Ontario EAA defines "proponent" as a person who:

a) Carries out or proposes to carry out an undertaking, or

b) Is the owner or person having charge, management or control of an undertaking.

For the purposes of this EPR Addendum, Metrolinx is the proponent of the GO Stations.

1.5.2 Transit Project Assessment Process

1.5.2.1 Overview

The TPAP is a proponent-driven, self-assessment process that does not require approval by the Minister of the Environment and Climate Change. However, proponents must complete the prescribed steps of the TPAP as defined in Sections 6 through 17 of O. Reg. 231/08, within specified timeframes. By following the TPAP, proponents of all public transit projects are exempt from the requirements of Part II and Part II.1 of the EAA. As this Project involves "Construction of a new commuter Rail Station" it meets the definition of a transit project as set out in Schedule 1 of O. Reg. 231/08 and is therefore subject to the TPAP.

Hatch in association with R.J. Burnside & Associates Limited (Burnside) was retained to complete the BRCE EPR in support of the TPAP for the BRCE Project. The purpose of the BRCE Project was to provide the required infrastructure to support the planned service improvements on the Barrie rail corridor. As documented within the EPR (dated August 2017), the BRCE Project included the following infrastructure components:

- A second track between Lansdowne Avenue in the City of Toronto (Mile 3.00) and the Allandale Waterfront GO Station in the City of Barrie (Mile 63.00)[3, 4];
- Upgrades at existing GO Stations along the corridor: Rutherford, Maple, King City, Aurora, Newmarket, East Gwillimbury, Bradford, Barrie South and Allandale Waterfront;
- Upgrades to existing structures within the Barrie rail corridor including bridges and culverts; and
- A new layover facility within the Town of Bradford West Gwillimbury for overnight storage of trains.

The EPR prepared for the BRCE Project was given notice to proceed by the Minister of the Environment and Climate Change on October 5, 2017.

[3] *The portion of the corridor from north of Bloor Street (Mile 3.91) to south of Davenport Road (Mile 4.87) falls within the area of the DDRGS Project which was assessed under a separate TPAP and includes a double track only.*

[4] *The double track expansion for the section of the Barrie rail corridor between south of Steeles Avenue (Mile 12.86) in the City of Toronto and south of the Rutherford GO Station (Mile 16.50) in the City of Vaughan was assessed under a separate EA (Barrie Corridor Double Track Expansion Project Summary Report, August 2014) and was not included as part of the BRCE Project TPAP.*

1.5.2.2 Changes to the Barrie Rail Corridor Expansion Project

Though the above-noted EPR for the BRCE Project documented the TPAP for rail infrastructure improvements along the Barrie rail corridor in the vicinity of the proposed GO Stations, it did not include an assessment of the proposed GO Stations as part of the transit project, and only mentioned that the five GO Stations would be subject to a future EPR Addendum. Thus, inclusion of the five GO Stations represents a change to the BRCE Project that is inconsistent with the BRCE EPR (August 2017). As per Section 15 of O. Reg. 231/08, any change that is inconsistent with a previously approved EPR requires a reassessment of the impacts (or effects) associated with the project, and the identification of potential new mitigation and monitoring measures, in an Addendum to the previously approved EPR. This Report has been prepared as an Addendum to the BRCE EPR to address the changes to the BRCE Project. It is noted that this Addendum focuses only on changes to the approved BRCE Project EPR, that is, inclusion of the five GO Stations, including Spadina-Front, Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations. Moreover, in preparing this EPR Addendum, the Ministry of the Environment (MOE) Guide entitled “Ontario’s Transit Project Assessment Process” (dated January 2014), was closely followed.

1.5.3 Overview of the Environmental Project Report Addendum

This EPR Addendum was prepared in accordance with Section 15(1) of O. Reg. 231/08. The following are the key steps in the EPR Addendum process:

- Complete an assessment of any impacts that the change may have on the environment;
- Prepare and distribute an EPR Addendum;
- Prepare and distribute a Notice of EPR Addendum (Notice); and
- Conduct a final review by the public and stakeholders prior to proceeding with the proposed EPR Addendum.

1.5.3.1 Content of the Environmental Project Report Addendum

Metrolinx formally submitted a Statement of Completion of the BRCE Project TPAP on October 5, 2017 for the proposed addition of tracks and supporting infrastructure from Lansdowne Avenue in the City of Toronto to the Allandale Waterfront GO Station in the City of Barrie. Notwithstanding, Metrolinx wishes to make a change to the transit project that is inconsistent with the EPR referred to in the noted statement. As per Section 15(1) of O. Reg. 231/08, Metrolinx has prepared this Addendum to the BRCE EPR which contains the following information:

- A description of the changes (Section 1.1.1);
- Reasons for the changes (Section 1.5.2.2);
- An assessment and evaluation of any impacts (or effects) that the changes may have on the environment (Section 4.3);
- A description of proposed mitigation measures for any negative effects that the changes to the BRCE Project may have on the environment (Section 4.3 and 4.4); and
- A statement of whether the proponent (i.e., Metrolinx) believes the change is a significant change to the transit project, and the reasons for the opinion (Section 1.5.3.2).

1.5.3.2 *Assessment of Significance of the Proposed Changes*

In accordance with Section 15 of O. Reg. 231/08, Metrolinx has assessed the significance of the proposed changes to the BRCE Project that are inconsistent with the approved 2017 EPR. Based on this assessment, Metrolinx confirms that the changes to the BRCE Project are considered significant for the following reasons:

- The potential environmental effects associated with the GO Stations were not assessed as part of the TPAP for the BRCE Project and were not addressed in the BRCE EPR; and
- Consultation with the pertinent municipalities and the general public regarding the inclusion of the GO Stations was not carried out and therefore was not documented within the BRCE EPR.

The decision to expand the number of GO Stations along the Barrie rail corridor was determined to be significant, therefore this EPR Addendum will document all changes that are inconsistent with the approved BRCE EPR (dated August 2017).

1.5.3.3 *Studies Conducted in Support of the Environmental Project Report Addendum*

A number of technical studies were conducted in support of this EPR Addendum to address the requirements outlined in O. Reg. 231/08. These technical studies were carried out by qualified professionals in accordance with the applicable protocols to characterize the existing conditions of the GO Station study areas, and assess the potential effects of the GO Stations on the natural, cultural, social and built environments.

Each of the five GO Stations' technical studies will be included as a Volume to the EPR Addendum, with the EPR Addendum, being included as part of Volume 1 along with the Stakeholder Consultation Report included as Appendix A of the Volume. Within each GO Station volume, the technical studies will be included as Appendices in the following format:

- Appendix A: Initial Preferred Design (Spadina-Front GO Station) or Preferred Design (Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations);
- Appendix B: Natural Environment Report;
- Appendix C: Tree Inventory Plan;
- Appendix D: Stage 1 Archaeological Assessment;
- Appendix E: Cultural Heritage Studies;
- Appendix F: Socio-Economic and Land Use Study;
- Appendix G: Air Quality Impact Assessment;
- Appendix H: Noise and Vibration Impact Assessment; and
- Appendix I: Transportation and Traffic Impact Analysis (Transportation Brief only for Spadina-Front GO Station).

This EPR Addendum is organized into volumes as listed below:

Volume 1: EPR Addendum (including Stakeholder Consultation Report as an Appendix)

Volume 2: Spadina-Front GO Station Design and Technical Studies (Appendix A to Appendix I)

Volume 3: Bloor-Lansdowne GO Station Design and Technical Studies (Appendix A to Appendix I)

Volume 4: Kirby GO Station Design and Technical Studies (Appendix A to Appendix I)

Volume 5: Mulock GO Station Design and Technical Studies (Appendix A to Appendix I)

Volume 6: Innisfil GO Station Design and Technical Studies (Appendix A to Appendix I)

1.6 Community Consultation Overview

Consultation is an essential component of the Project as it is integral to share information, generate ideas and obtain community feedback. The purpose of the consultation program was to identify stakeholders, introduce the EPR Addendum and gather preliminary concerns and comments. The EPR Addendum consultation process was initiated in the summer of 2017 and continued through the fall of 2017, winter and spring of 2018.

Building from consultation undertaken during the BRCE Project and aligned with O. Reg. 231/08, consultation for the EPR Addendum included consulting with the Director of the MOECC; preparation of a Master Contact List which housed all stakeholder and community information; establishment of a Project-specific website; convening a series of public meetings; undertaking Indigenous community engagement; conducting TAC meetings and providing technical reports for stakeholder review and feedback.

Key themes in community feedback included: potential noise and vibration effects (train whistles and bells) for residents in the vicinity of the GO Stations; the need for coordination of service with local transit to access the GO Stations; concern for lack of available parking at GO Stations; potential impacts on local traffic near the GO Stations; LOS and scheduling of additional GO service; accessibility of GO Stations for persons using mobility devices; and the potential need for property acquisitions. All community feedback was captured in the Stakeholder Consultation Report (SCR) included as Appendix A in Volume 1 of this EPR Addendum.

Further details regarding the Community Consultation Program carried out for the EPR Addendum are provided in Section 5.

1.7 Environmental Project Report Addendum Approval Process

Following the preparation of this EPR Addendum, and filing a Notice of EPR Addendum, the EPR Addendum will be made available to the public, regulatory agencies, Indigenous communities and/or organizations, and other interested persons for review. Specifically, the Notice of EPR Addendum will be provided to:

- All property owners within 30 metres of the GO Station study areas will receive an addressed notice, and residents within 200 metres of the study area (Spadina-Front and Bloor-Lansdowne GO Stations) and within 400 metres of the study area (Kirby, Mulock, and Innisfil GO Stations) will receive a non-addressed notice;
- The Director of the MOECC, Environmental Approvals Branch;

- The Director of the MOECC, Central Region Office;
- Indigenous communities that were given a Notice of EPR Addendum (follow up phone calls were placed to communities to confirm receipt of the notices and ensure the community was aware of the opportunity to comment, assess the level and type of interest in the EPR Addendum and inquire if they have any comments/questions, as well as establish how they wished to be engaged in the future); and
- Any other person Metrolinx believes may be interested in the change to the Project.

The Notice will also be placed in local newspapers that have general circulation covering the location of the Project, and will be placed on Metrolinx's Project Website (http://www.metrolinx.com/newstations/). The public review period will be for 30 days, in accordance with O. Reg. 231/08.

If members of the public, regulatory agencies, Indigenous communities, or other interested parties have concerns regarding the changes to the Project following the Notice of EPR Addendum, they shall submit an objection to the MOECC. Objections must be provided during the 30-day review period for the EPR Addendum, and objections received after the review period has ended will not be considered. Individuals or groups wishing to submit an objection to the Minister should provide the following information:

- Name, mailing address, organization or affiliation (where applicable), daytime telephone number, e-mail address (where possible);
- Contact details of the proponent (i.e., Metrolinx) including name address and telephone number;
- Brief description of the proposed undertaking;
- Basis for why further study is required, including identification of any negative effects that relate to a matter of provincial importance or a constitutionally protected Aboriginal or treaty right that was not identified in the proponent's EPR Addendum; and
- Summary of how the person(s) objecting have participated in the Project's consultation process.

Ontario Regulation 231/08 (O. Reg. 231/08) states that only objections related to matters of provincial importance or a constitutionally protected Indigenous or Treaty right will be considered as objections. The Ministry will forward a copy of the objections to Metrolinx for consideration. It is noted that Metrolinx will have less than a week to comment on the objections. During this time, Metrolinx can identify where in the EPR Addendum the appropriate information can be found, or provide the missing information.

Following the 30-day review period, the Minister of the Environment and Climate Change has 35 days to consider any objections regarding negative impacts of the transit project during which time the Ministry would provide notice to Metrolinx as the Project proponent. During the 35-day period, the Minister will consider whether the changes to the BRCE Project will have a negative effect on a matter of provincial importance or a constitutionally protected Aboriginal or treaty right received during the 35-day period. Should the Minister act within the 35-day period, one of the following three notices may be issued to Metrolinx:

- A Notice to Allow a Change to a Transit Project in Accordance with an Addendum;
- A notice that requires Metrolinx to conduct additional work including additional investigations or consultation, prior to proceeding with the Project; or
- A notice allowing Metrolinx to proceed with the Project as documented in the EPR Addendum, subject to conditions.

2. Project Description

2.1 Overview

Metrolinx refined and updated the concept designs previously approved by the local municipalities and the Metrolinx Board in 2016, and presented in the IBC for four of the five GO Stations. These are referred to as Preferred Designs and each reflects design, technical feasibility and policy direction received through stakeholder consultation. This resulted in a Preferred Design for four of the five GO Stations, which is provided in Appendix A (of Volume 2 through Volume 6 of this EPR Addendum), with renderings provided in Figure 2-1, Figure 2-2, Figure 2-5, Figure 2-6 and Figure 2-7 of this EPR Addendum. The Preferred Design was used as the basis for the assessment in this EPR Addendum and will be used as the starting point to develop a Reference Concept Design (RCD). As the Spadina-Front GO Station design was not updated since November 2017, its design is referred to as an IPD in this EPR Addendum.

Refinements to the Preferred Designs/IPD may be made prior to construction. As appropriate, design refinements will be subject to the EPR Addendum process prescribed in O. Reg. 231/08, in Section 1.5.3 of this EPR Addendum.

2.2 Key Design Criteria

The following assumptions helped guide the development of the GO Station designs:

- Prioritize pedestrian/bicycle access to the GO Station from nearby communities and transit systems;
- Provide connectivity to local transit systems;
- Adhere to GO Design Requirement Manual (DRM) standards for design considerations as well as Local By-laws;
- Integrate vehicular access into local traffic plans;
- Protect for a third track, required for future expansion (where applicable);
- Minimize impact to existing utilities; and
- Minimize property acquisition.

2.3 Spadina-Front GO Station

The IPD for the Spadina-Front GO Station is presented in Figure 2-1, including GO Station facilities and amenities.

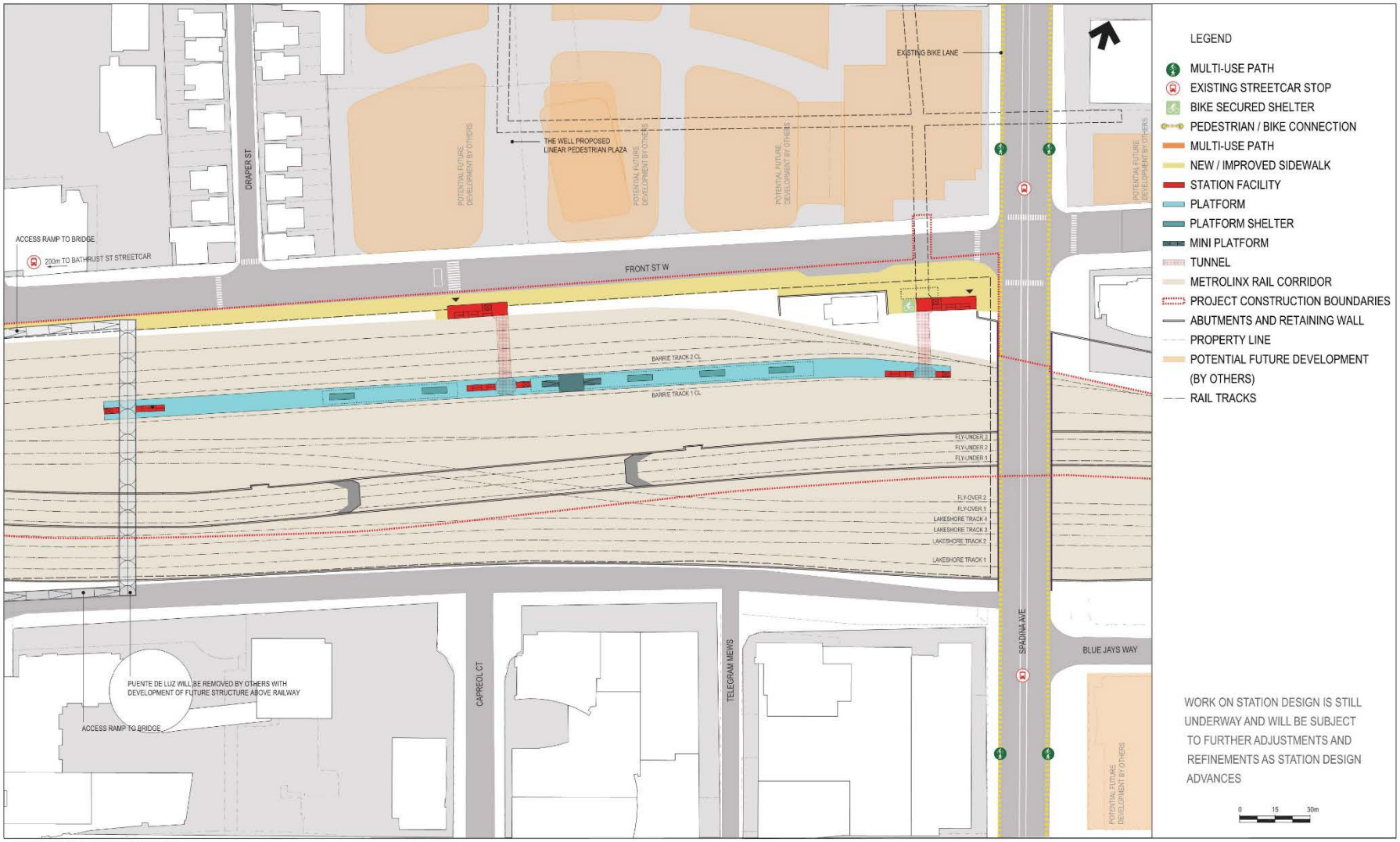


Figure 2-1: Spadina-Front GO Station – Initial Preferred Design

2.3.1 Platform

The Spadina-Front GO Station is conceived as an island platform located just west of the rail underpass under Spadina Avenue. The GO Station platform will be located near the intersection of Front Street West and Spadina Avenue, extending parallel to Front Street West to the western edge of Puente de Luz, a bridge for pedestrians and cyclists, connecting the Concord CityPlace neighbourhood to Front Street West.

2.3.2 Station Entrances

The design includes two GO Station access locations on the north side of the rail corridor, as follows:

- Access through the main GO Station building on the west side of the intersection at Spadina Avenue and Front Street West; and
- A second access approximately 200 metres west of the main GO Station building on Front Street West.

These are shown in Figure 2-1.

2.3.3 Station Circulation

GO Station circulation is designed with principles of universal accessibility in mind. Staircases will provide the primary access between GO Station levels, with accompanying elevators. Two pedestrian tunnels will provide access to the platforms from Spadina Avenue and Front Street West. A staircase and an elevator will be provided at the end of each tunnel.

2.3.4 Bicycle Facilities

Secured spaces will be located in the GO Station building itself or close to the GO Station's entrance. As no bike facility is proposed on the south side of the rail corridor, cyclists will access the secured bike shelter via either Puente de Luz or the shared bike lane markings (sharrows) along Spadina Avenue.

2.3.5 Landscaping and Streetscaping

As per Figure 2-1, landscaping and streetscaping has been identified at a high level. The number, location, and effect to sight lines of the landscaping strategy will be investigated as part of detailed design.

2.3.6 Transit Access

The City of Toronto has a comprehensive transit system operated by the TTC. Current routes that run though the study area and could connect transit users to the station include the following:

- 121 - Fort York-Esplanade Eastbound/Westbound Bus;
- 510 - Spadina Northbound/Southbound Streetcar;
- 504 King Eastbound/Westbound Streetcar;
- 304 King Eastbound//Westbound Streetcar;
- 310 Spadina Northbound/Southbound Streetcar;
- 511 Bathurst Street Northbound/Southbound Streetcar;

- 307 Bathurst Street Northbound/Southbound Streetcar; and
- 514 Cherry Eastbound/Westbound Streetcar.

2.3.7 Active Transportation Access

The GO Station will be supported by a high-volume of local surface transit services and will respond to the growth from residential and office development in the neighbourhood. The Spadina-Front GO Station has been designed to improve pedestrian and cycling connectivity between surrounding communities, by completing the missing links between these networks. These improvements will include pedestrian and cycling access on the north side of the rail corridor through tunnel connections and other public realm enhancements. These include:

- A tunnel connection to the Toronto "PATH" network, to provide access to/from the east GO Station access to/from the Well Development proposed near the northwest corner of Front Street West and Spadina Avenue;
- A pedestrian crossing on Front Street West, directly in front of the west GO Station access; and
- New/improved sidewalks on the south side of Front Street West between Portland Street and Spadina Avenue.

2.3.8 Vehicular Access

The GO Station will not include a PPUDO, bus loops or parking facilities. There may be informal on-street lay-by activities from personal vehicles, as well as taxi and ridesharing (i.e., Uber) vehicles.

2.3.9 Accessible Loading and Unloading

The GO Station design will include an accessible lay-by area. Accessible transit operations will be located adjacent to the main GO Station access building, in close proximity to the tunnels and mini-platforms.

2.3.10 Emergency Service/Corridor Access

There is an access road currently off of Front Street West near Bathurst Street which will continue to provide limited access to the corridor for emergency service purposes. The GO Station platform area is below street grade. Emergency Service access to the corridor can also be provided via the access ramp located east of Spadina Avenue leading from behind the 381-397 Front Street West development.

2.3.11 Property Acquisition

No property acquisition is expected for the construction of the new Spadina-Front GO Station.

2.3.12 Utilities

The following utilities have been identified based on the information extracted from record drawings.

- Power, Cables, Conduits and Lighting: Toronto Hydro;
- Gas and Oil: Enbridge Gas Distribution;
- Communications: Bell Canada, Rogers Cable Communications, Group Telecom, and Zayo; and

- Municipal services: watermains, sanitary sewers, storm drainage: City of Toronto.

Twenty-four potential utility conflicts were identified by Metrolinx at the proposed Spadina-Front GO Station footprint (10 private and 14 municipal). The potential utility conflicts are all in relation to existing utilities and comparing the utility locations to the GO Station infrastructure (A. Gallardo, personal communication, October 19, 2017). A breakdown of the utility conflicts is presented in Table 2-1. The appropriate measures to address and resolve conflicts with the utility owners will be undertaken.

Table 2-1: Potential Utility Conflicts Identified by Metrolinx

Total Number	Utility Type	Utility Owner	Quantity
10	Private	Bell	1
		Gas	1
		Hydro	2
		Rogers	1
		Zayo	4
		Telecom	1
14	Municipal	Sanitary	0
		Sewer Combined	0
		Storm	12
		Water	2

2.3.13 Electrification

The layout of the Spadina-Front GO Station accounts for the inclusion of OCS poles. Metrolinx will confirm the location of the Overhead Catenary System (OCS) poles during the detailed design phase.

2.3.14 Construction Staging/Laydown Areas

During construction, the train storage area of the rail yard will be closed and used as the construction staging/laydown areas. Construction staging will be kept within the existing station site where possible.

2.3.15 Stormwater Management

2.3.15.1 Drainage Criteria and Stormwater Management Objectives

Drainage design criteria for the Spadina-Front GO Station have been developed to provide the framework for safe and functional conveyance of storm runoff from the site. The criteria were developed from Toronto and Region Conservation Authority's (TRCA) Stormwater Management Criteria document and the City of Toronto's Wet Water Flow Master Plan (WWFMP) Guidelines, which are summarized as follows:

- SWM quantity control:
  - In accordance with the City of Toronto's Wet Weather Flow Management Guidelines (WWFMG) requirements, new developments for lot level conveyance controls (parking and roof-top storage) are to be designed to reduce post-development peak flows to the pre-development flow.
- SWM quality control:
  - Quality Control criterion is based on the City of Toronto's WWFMG:
    - Water quality target is the long-term average removal of 80 percent Total Suspended Solids (TSS) on an annual loading basis.
  - The SWM design will be designed to follow a treatment train approach providing multiple barriers of quality control, where feasible.
- Water balance management:
  - Water Balance criterion is based on the City of Toronto's WWFMG:
    - The WWFMG indicates retaining stormwater on-site to achieve the same level of annual volume of overland runoff allowable from the development site under pre-development conditions.
- Erosion and sediment control:
  - Erosion and sediment control will be in accordance to the City of Toronto's Green Building Standards, which require the protection of water quality during construction through erosion and sediment control plans designed in accordance with the Greater Golden Horseshoe Area Conservation Authorities (GGHACA) Erosion and Sediment Control Guideline for Urban Construction, 2006 (Greater Golden Horseshoe Area Conservation Authorities, 2006).
- Drainage Design Criteria:
  - For municipal and non-railway drainage infrastructure - Design Criteria for Sewers and Watermains (City of Toronto, 2009a); and
  - For track drainage infrastructure - American Railway Engineering and Maintenance-of-Way Association (AREMA) Standards (AREMA, 2009).

A SWM Plan will be developed during the detailed design phase of the Project and will ensure that the Spadina-Front GO Station follow the appropriate criteria.

2.3.15.2 Stormwater Management Strategy

The following are the Spadina-Front GO Station drainage and SWM facilities that will be explored for the site design to satisfy the required drainage criteria and stormwater management objectives and targets. Mitigation measures will be confirmed during the detailed design phase, however the criteria they follow will be consistent as described above.

- SWM Quantity Control Treatment – SWM facilities in the form of underground storage infrastructure:

  - The treatment facilities consider the use of underground storage tank facilities, storage pipes, and/or pre-fabricated chamber systems.

- SWM Quality Control Treatment – Stormwater quality control facilities in the form of mechanical and natural treatment measures.
  - The mechanical facilities will consider, but not limited to the use of Oil Grit Separators (OGS) units and/or Catch Basin (CB) inserts; and
  - The natural stormwater quality facilities consider, but not limited to the use of bio-swales and/or vegetated filter strips.
- Water balance treatment – Water balance targets will be satisfied through the use of vegetated planting areas, underground storage facilities within an open bottom component, and natural quality facilities.
- Erosion and sediment control treatment – ESC targets will be established during detailed design, however the principles from the GGHACA shall be employed for the site.
- Drainage conveyance – Runoff shall be conveyed using appropriately sized storm sewers, where required. A combination of catchbasins and maintenance holes will be strategically spaced to satisfy the hydraulic requirements. Culvert structures will be sized and installed as required.

A Stormwater Management Report will be prepared to identify the following elements:

- Establish drainage criteria and SWM objectives to meet local and provincial requirements applicable for the Spadina-Front GO Station;
- Identify drainage patterns, existing outfalls, delineate sub-catchments and assess conditions from the study area to the receiving environment;
- Generate hydrologic and hydraulic analysis to stimulate pre-development (existing) and proposed development flow conditions under various storm events; and
- Evaluate the drainage structures and conveyance systems within the rail corridor against the identified drainage design and SWM criteria.

2.3.16 Retaining Walls

The requirement to extend a new sidewalk along the existing southern curb edge of Front Street West from the Puente de Luz to Spadina Avenue will require either backfilled retaining walls or some type of column support system as the sidewalk widens three to four metres into the backsloped area adjacent to Front Street West. There is currently no sidewalk at this location.

2.3.17 Grade Separation

The existing Bathurst Street and Spadina Avenue overpasses of the rail corridor will remain unchanged except for the future electrification elements (OCS) for RER.

2.3.18 Connection to Barrie Rail Corridor Expansion

The GO Station central platform is proposed to serve two Barrie rail corridor tracks in the GO Bathurst layover yard. Existing tracks will require realignment to accommodate the GO Station platforms.

2.4 Bloor-Lansdowne GO Station

The Preferred Design for Bloor-Lansdowne GO Station is presented in Figure 2-2, including GO Station facilities and amenities. This is within the Bloor-Lansdowne GO Station south study area. The Preferred Design for the Earlscourt Bridge is presented in Figure 2-3. This is within the Bloor-Lansdowne GO Station north study area. The Preferred Design for the MUP south of the Bloor-Lansdowne GO Station connecting to the WTRP Extension is presented in Figure 2-4.

2.4.1 Platform

The GO Station will include two side platforms located south of Bloor Street West and west of St Helens Avenue. The eastern (northbound) platform will be connected to the building's upper level.

2.4.2 Station Entrances

The primary GO Station entrance building has been located so as to be visible from Bloor Street West. This entrance is contained in a two-storey building that provides convenient walk-up and elevator access for pedestrians. The building's upper level connects to a proposed new access road off of St Helens Avenue, as well as the accessible lay-by, bicycle facilities, MUP and the eastern (northbound) platform.

A secondary entrance will be located near the south end of the platform with access points from both Sterling Road and Dora Avenue. A bike shelter will be provided on the east side of the rail corridor.

There will be three GO Station access structures including one main GO Station building to the east of the rail corridor, as shown in Figure 2-2.

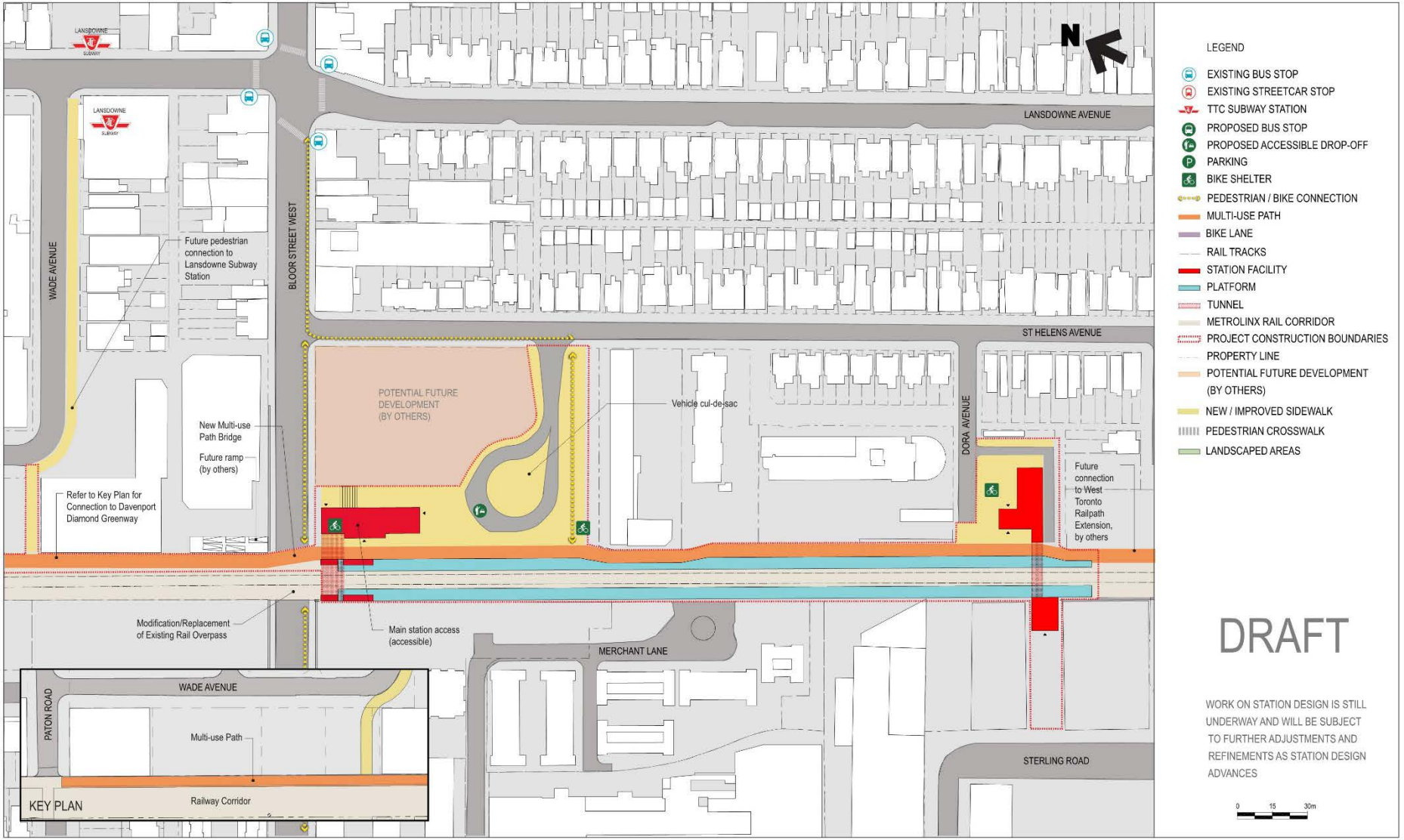


Figure 2-2: Bloor-Lansdowne GO Station – Preferred Design (South Study Area)

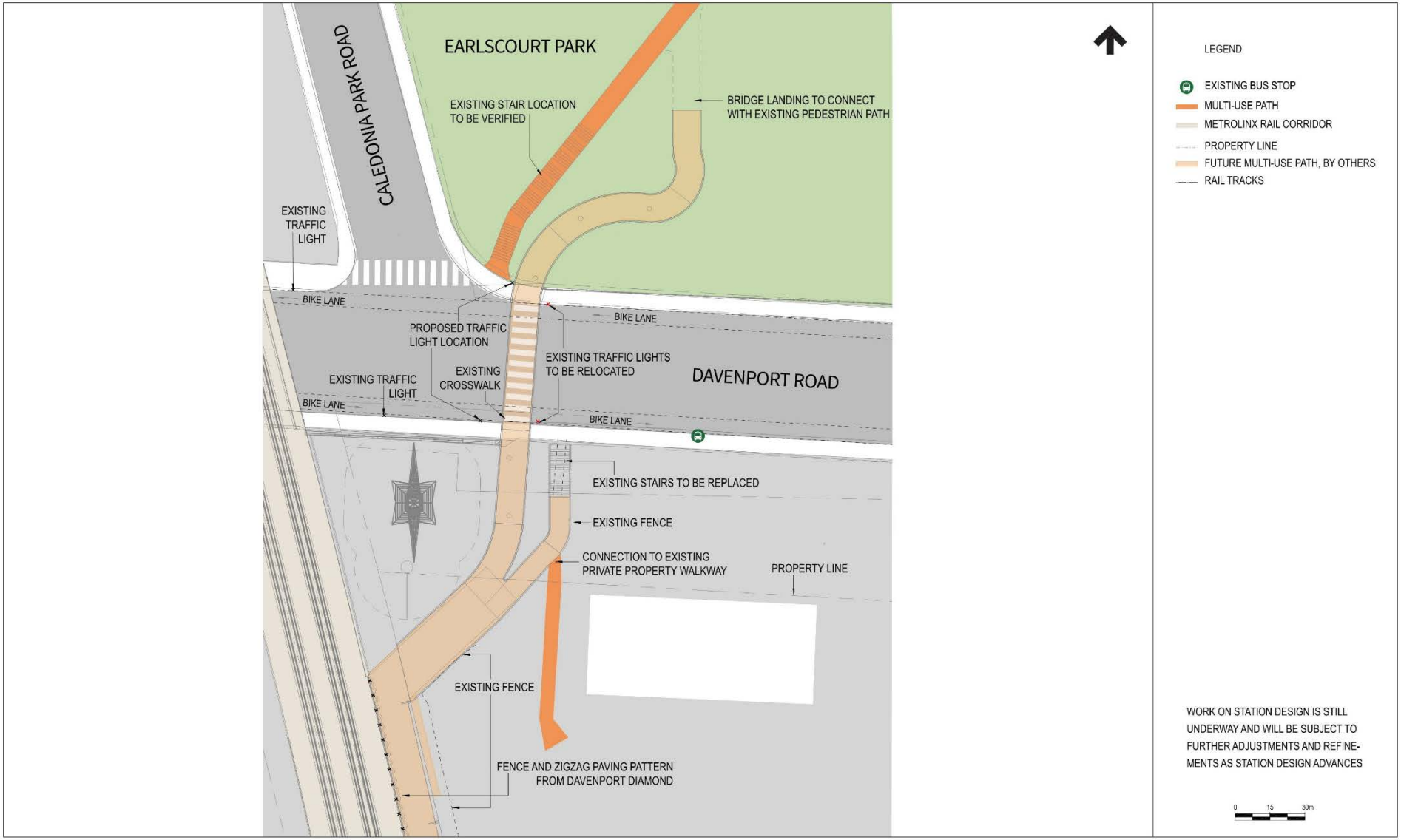


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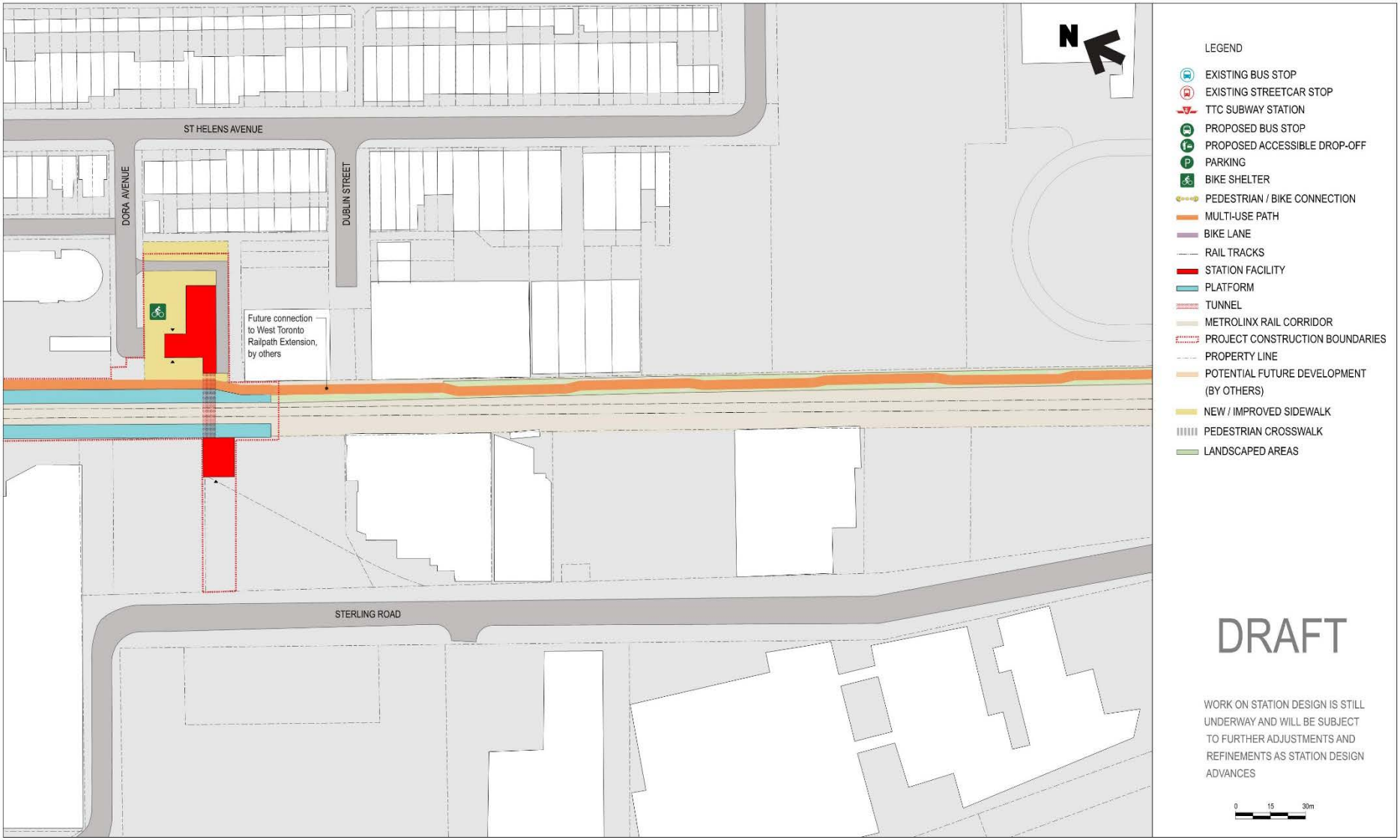
Figure 2-3: Bloor-Lansdowne GO Station – Preferred Design (North Study Area)



Work on station design is still underway and will be subject to further adjustments and refinements as station design advances.

Figure 2-4: Bloor-Lansdowne GO Station – Preferred Design Multi-Use Path (1/2)

Work on station design is still underway and will be subject to further adjustments and refinements as station design advances.

Figure 2-4: Bloor-Lansdowne GO Station – Preferred Design Multi-Use Path (2/2)

2.4.3 Station Circulation

Two tunnels will link the east and west platforms, and include stairs and elevators. Stairs will be enclosed or covered. The GO Station will also facilitate neighbourhood connectivity across the rail corridor. Tunnel entrances will be aligned with active transportation networks.

2.4.4 Bicycle Facilities

Bicycle parking is proposed on the east side of the Barrie rail corridor, near the GO Station entrances. Three secure bicycle storage rooms and one covered bike shelter are proposed.

2.4.5 Landscaping and Streetscaping

As per Figure 2-2 through Figure 2-4, landscaping and streetscaping has been identified at a high level. The number, location, and effect to sight lines of the landscaping strategy will be further investigated during detailed design.

2.4.6 Transit Access

The TTC is responsible for public transit in the City of Toronto (TTC, 2017). Current TTC routes that run in the area and could connect transit users to the station include the following:

- Bloor-Danforth Eastbound/Westbound Subway Line;
- 40 Junction Eastbound/Westbound Bus;
- 47 Lansdowne Northbound/Southbound Bus;
- 504 King Eastbound/Westbound Streetcar;
- 505 Dundas Eastbound/Westbound Streetcar;
- 506 Carlton Eastbound/Westbound Streetcar; and
- 402 Community Northbound/Southbound Bus.

Regional public transit routes that run in the area and could connect transit users to the station include the following:

- Union Pearson Express Northbound/Southbound Rail Line;
- Barrie GO Northbound/Southbound Rail Line;
- Kitchener GO Northbound/Southbound Rail Line; and
- Milton GO Northbound/Southbound Rail Line.

The property northeast of the GO Station will provide an enhanced GO-TTC Subway connection from Wade Avenue.

2.4.7 Active Transportation Access

There will be two pedestrian tunnels providing access to the platforms from Bloor Street West, Sterling Road and Dora Avenue; three bicycle parking areas; an improved/expanded sidewalk along Wade Avenue providing a pedestrian link between the GO Station and the Lansdowne TTC Station; a MUP, running parallel to the Barrie rail corridor on the east side, and extending from the GO Station site to south of Dundas Street West; and a MUP bridge over Davenport Road onto Earlscourt Park, located approximately two km north of the GO Station site.

The MUP connecting to the Bloor-Lansdowne GO Station on the east side provides active transportation connectivity to the WTRP extension south of Dundas Street, Dundas Street West/St Helens Avenue, the Greenway along the DDRGS north of the GO Station, the Lansdowne TTC Station through the connection at Wade Avenue, and Bloor Street West. The bridge to Earlscourt Park provides active transportation connectivity from the DDRGS to Earlscourt Park.

2.4.8 Vehicular Access

An accessible lay-by connecting the GO Station entrance to St Helens Avenue is proposed.

2.4.9 Accessible Loading and Unloading

Accessible transit operations will be located adjacent to the main GO Station building, in close proximity to the tunnels and mini-platforms.

2.4.10 Emergency Service/Corridor Access

A cul-de-sac off of St Helens Avenue will accommodate the turning radius of emergency vehicles. The GO Station design includes a mountable curb which will allow emergency vehicles to park at the main GO Station building entrance.

2.4.11 Property Acquisition

The information in this section reflects property acquisition data dated January 22, 2018. Property acquisition for the station will total an estimated 1.0 hectares (ha) of land zoned as mixed use; approximately 0.05 ha of land zoned as utility/transportation, and approximately 0.5 ha of land zoned as industrial. This does not include the MUP connection south or the Earlscourt Park connection to the north; land required for these station components will be confirmed during detailed design.

2.4.12 Utilities

The following utilities have been identified based on the information extracted from record drawings.

- Power, Cables, Conduits and Lighting: Toronto Hydro;
- Gas and Oil: Enbridge Gas Distribution;
- Communications: Bell Canada, Rogers Cable Communications; and
- Municipal services: watermains, sanitary sewers, storm drainage: City of Toronto.

Forty potential utility conflicts were identified by Metrolinx for the proposed Bloor-Lansdowne GO Station footprint (27 private and 13 municipal). The potential utility conflicts are all in relation to existing utilities and comparing the utility locations to the GO Station infrastructure (A. Gallardo, personal communication, October 19, 2017). A breakdown of the utility conflicts is presented in Table 2-2. Appropriate measures will be taken related to conflict resolution with the utility owners.

Table 2-2: Bloor-Lansdowne GO Station - Potential Utility Conflicts Identified by Metrolinx

Total Number	Utility Type	Utility Owner	Quantity
27	Private	Bell	11
		Gas	4
		Hydro	9
		Rogers	3
13	Municipal	Sewer Combined	3
		Storm	7
		Water	3

2.4.13 Electrification

The layout of the Bloor-Lansdowne GO Station and the MUP connection to the WTRP extension accounts for the inclusion of OCS poles. Metrolinx will confirm the location of the OCS poles during detailed design.

2.4.14 Construction Staging/Laydown Areas

Construction staging will be kept within the existing station site where possible.

2.4.15 Stormwater Management

2.4.15.1 Drainage Criteria and Stormwater Management Objectives

Drainage design criteria for the Bloor-Lansdowne GO Station have been developed to provide the framework for safe and functional conveyance of storm runoff from the site. The criteria were developed from TRCA Stormwater Management Criteria document and the City of Toronto's WWFMP Guidelines, which are summarized as follows:

- SWM quantity control:
  - In accordance with the City of Toronto's WWFMG requirements, new developments for lot level conveyance controls (parking and roof-top storage) are to be designed to reduce post-development peak flows to the pre-development flow.
- SWM quality control:
  - Quality Control criterion is based on the City of Toronto's WWFMG:
    - Water quality target is the long-term average removal of 80 percent TSS on an annual loading basis.
  - The SWM design will be designed to follow a treatment train approach providing multiple barriers of quality control, where feasible.
- Water balance management:
  - Water Balance criterion is based on the City of Toronto's WWFMG.
    - The WWFMG indicates retaining stormwater on-site to achieve the same level of annual volume of overland runoff allowable from the development site under pre-development conditions.

- Erosion and sediment control:
  - Erosion control will be in accordance to the City of Toronto's Green Building Standards, which require the protection of water quality during construction through erosion and sediment control plans designed in accordance with the GGHACA Erosion and Sediment Control Guideline for Urban Construction, 2006.
- Drainage Design Criteria:
  - For municipal and non-railway drainage infrastructure - Design Criteria for Sewers and Watermains (2007); and
  - For track drainage infrastructure - AREMA Standards (2009).

A SWM Plan will be developed during the detailed design phase of the Project and will ensure that the Bloor-Lansdowne GO Station follow the appropriate criteria.

2.4.15.2 Stormwater Manament Strategy

The following are the Bloor-Lansdowne GO Station drainage and SWM facilities that will be explored for the site design to satisfy the required drainage criteria and stormwater management objectives and targets. Mitigation measures will be confirmed during the detailed design phase, however the criteria they follow will be consistent as described above.

- SWM Quantity Control Treatment – SWM facilities in the form of underground storage infrastructure:
  - The treatment facilities consider the use of underground storage tank facilities, storage pipes, and/or pre-fabricated chamber systems.
- SWM Quality Control Treatment – Stormwater quality control facilities in the form of mechanical and natural treatment measures:
  - The mechanical facilities will consider, but not limited to the use of OGS units and/or CB inserts; and
  - The natural stormwater quality facilities consider, but not limited to the use of bio-swales and/or vegetated filter strips.
- Water balance treatment – Water balance targets will be satisfied using vegetated planting areas, underground storage facilities within an open bottom component, and natural quality facilities.
- Erosion and sediment control treatment – ESC targets will be established during detailed design, however the principles from the GGHACA shall be employed for the site.
- Drainage conveyance – Runoff shall be conveyed using appropriately sized storm sewers, where required. A combination of catchbasins and maintenance holes will be strategically spaced to satisfy the hydraulic requirements. Culvert structures will be sized and installed as required.

A Stormwater Management Report will be prepared to identify the following elements:

- Establish drainage criteria and SMW objectives to meet local and provincial requirements applicable for the Bloor-Lansdowne GO Station;
- Identify drainage patterns, existing outfalls, delineate sub-catchments and assess conditions from the study area to the receiving environment;
- Generate hydrologic and hydraulic analysis to stimulate pre-development (existing) and proposed development flow conditions under various storm events; and
- Evaluate the drainage structures and conveyance systems within the site boundaries against the identified drainage design and SWM criteria.

2.4.16 Retaining Walls

There will be a retaining wall along the east edge of the MUP, and along the cul-de-sac from St Helens Avenue to Dora Avenue. This will be confirmed as the design progresses.

2.4.17 Grade Separation

The existing Bloor Street West rail overpass may require either modification or replacement to accommodate the addition of the GO Station platforms south of Bloor Street West and the DDRGS north of the rail overpass. The proposed connection to the DDRGS Greenway will require a MUP bridge over Bloor Street West to the east of the rail overpass to provide a connection to the GO Station. The proposed connection from the DDRGS Greenway to Earlscourt Park will require construction of a MUP bridge over Davenport Road from the southeast corner of the intersection of Davenport Road and Caledonia Park Road into the southwest corner of Earlscourt Park.

2.4.18 Connection to Barrie Rail Corridor Expansion

The Barrie rail corridor consists of one existing track, with a second future track currently planned for the west side of the rail corridor. The GO Station would require a westward shift of the existing track to support GO Station platforms and the MUP, as well as track realignment at the future DDRGS.

2.5 Kirby GO Station

The Preferred Design for the Kirby GO Station is presented in Figure 2-5, including GO Station facilities and amenities, which form the basis of this TPAP. Refinements to the design may be made prior to construction. As appropriate, design refinements will be subject to the EPR Addendum process prescribed in O. Reg. 231/08 and described in Section 1.7 of this document.

Work on station design is still underway and will be subject to further adjustments and refinements as station design advances.

Figure 2-5: Kirby GO Station – Preferred Design

2.5.1 Platform

The station will include two side platforms located south of Kirby Road, with two pedestrian tunnels providing access to the platform, Kirby Road and the future developments east and west of the station site.

2.5.2 Station Entrances

Three GO Station access structures including a main GO Station building to the east of the rail corridor and secondary GO Station entrances east and west of the rail corridor near the south end of the platforms.

The location of the primary entrance on the east will be adjacent to the east of the PPUDO and north of the bus loop, and will include a bicycle shelter south of the entrance. A secondary entrance will be located near the south end of the platform, with access points on the west and east side of the rail corridor. The location of the secondary entrance on the east lies adjacent to east parking facilities. The entrance on the west side of the rail corridor will be adjacent to a MUP and will have a bike shelter.

2.5.3 Station Circulation

Station circulation is designed with principles of universal accessibility in mind. Two pedestrian tunnels will link the east and west platforms, and include stairs and elevators. Stairs will be enclosed or covered.

The GO Station will also facilitate neighbourhood connectivity across the rail corridor. Tunnel entrances will accomodate future active transportation networks.

2.5.4 Bicycle Facilities

Three bicycle parking areas are proposed on both sides of the rail corridor, near the GO Station entrances.

2.5.5 Landscaping and Streetscaping

As per Figure 2-5, landscaping and streetscaping has been identified at a high level. The number, location, and impact to sight lines of the landscaping strategy will be developed during detailed design.

2.5.6 Transit Access

There is no major transit network within the Kirby study area, with the exception of the proposed Kirby GO Station (City of Vaughan, 2012). The City of Vaughan is in the process of developing the NVNCTMP to create a sustainable transportation network considering all forms of transportation until 2031 (City of Vaughan, 2017a).

Public transit within the Kirby study area is provided by York Region (YRT/Viva), connecting York University (south of the Kirby study area) to Seneca/King Campus (north of the Kirby study area) (YRT, 2017). Current routes that run in the area and could connect transit users to the station include the following:

- 22/22A King City Northbound/Southbound Bus; and
- 96 YRT Northbound/Southbound Bus.

There are plans to implement “Frequent Transit Network” corridors between 2027 and 2031 on Kirby Road and Keele Street adjacent to Kirby GO Station. Jane Street between Kirby Road

and Major Mackenzie Drive, and Teston Road between Pine Valley Drive and Kennedy Road are also planned to be part of the Frequent Transit Network between 2027 and 2031. These corridors are expected to have 15-minute transit service or better. Frequent transit service will likely improve transit ridership as transfer time between routes will decrease. It will also become easier for transit users to plan trips because buses will arrive more frequently, reducing trip planning times.

Metrolinx plans to provide bus service to supplement the train service to this station through the provision of the following:

- Overnight northbound and southbound buses on an hourly basis between 11:00 P.M. and 5:00 A.M.

A proposed six bay bus loop with two bus layovers is sized with consideration for GO Transit and YRT/Viva service in the region.

2.5.7 Active Transportation Access

There will be a network of new MUPs to accommodate pedestrians and cyclists on both sides of the rail corridor. The MUPs along the access roads from Keele Street will provide access to the primary station building. On the east side of the corridor rail corridor, a connection to the proposed Super Trail MUP will extend south from the secondary station building and provide access to both station buildings, connecting current developments east of Keele Street to the station facilities. On the west sideof the rail corridor, a connection to the proposed Super Trail MUP will extend south from the secondary station building, and will provide connectivity to future developments to the west of the station.

The Kirby GO Station will be designed to enhance connectivity to future planned trails and pathways, such as the proposed Vaughan Super Trail, which includes connections to the TransCanada corridor to the south of the proposed station, North Maple Regional Park (NMRP), and supports linkages to the Town of Richmond Hill and Lake to Lake Route.

2.5.8 Vehicular Access

The main GO Station building is proposed to be located to the east of the rail corridor. Three access roads provide bus and vehicle entry off Kirby Road and Keele Street, with a bus loop north of the main GO Station building, while the PPUDO lies east of the main GO Station building. Parking is located west of the main and the secondary GO Station buildings, accessed through the new intersection at Kirby Road (Access 1) and two intersections on Keele Street (Access 2 and 3).

2.5.9 Accessible Loading and Unloading

The GO Station will provide one PPUDO area for motorists, east of the main GO Station building. Parking areas will be provided to accommodate 1,000 vehicles.

2.5.10 Emergency Service/Corridor Access

Emergency vehicles will be able to utilize an internal circulation route within the parking lot to reach any part of the GO Station site, excluding the rail corridor and GO Station platforms. As three accesses to the GO Station site are provided via Keele Street and Kirby Road, emergency vehicles will be able to exit Kirby GO Station even if one of these accesses is obstructed in case of an emergency.

2.5.11 Property Acquisition

The information in this section reflects property acquisition data dated January 22, 2018. Land acquisition will total approximately 8.1 ha of land zoned as agriculture for the new Kirby GO Station.

2.5.12 Utilities

Fifty-two potential utility conflicts were identified by Metrolinx at the proposed Kirby GO Station location (29 private and 23 municipal). The utility conflicts are all in relation to existing utilities. A breakdown of the utility conflicts is presented in Table 2-3. The appropriate mitigation measures will be taken for conflict resolution with the utility owners.

Table 2-3: Potential Utility Conflicts Identified by Metrolinx

Total Number	Utility Type	Utility Owner	Quantity
29	Private	Bell	13
		Unknown	3
		Gas	12
		Rogers	1
23	Municipal	Sanitary	4
		Storm	5
		Water	14

The TransCanada Pipeline Canadian Mainline crosses the Kirby GO Station study area, just south of the Kirby GO Station footprint, in an east-west direction.

2.5.13 Electrification

The layout of the Kirby GO Station accounts for the inclusion of OCS poles. Metrolinx will confirm the location of the OCS poles during detailed design.

2.5.14 Construction Staging/Laydown Areas

The proposed site of the GO Station is expected to serve as a primary staging/laydown area as well as access to the rail corridor for constructing the platforms at the tracks.

2.5.15 Stormwater Management

2.5.15.1 Drainage Criteria and Stormwater Management Objectives

Drainage design criteria for the Kirby GO Station have been developed to provide the framework for safe and functional conveyance of storm runoff from the site. The criteria were developed from TRCA Stormwater Management Criteria document and the City of Vaughan's Engineering Design Criteria and Standard Drawings, which are summarized as follows:

- SWM quantity control:
  - In accordance with the TRCA SWM Criteria and City of Vaughan SWM requirements:
    - Site developments are to be designed to reduce post-development peak flows to the pre-development flow; and
    - Apply the unit flow rates for predevelopment conditions for the Don River Watershed, where feasible.
- SWM quality control:

- Quality Control criterion is based on the TRCA SWM Criteria:
  - Water quality target is the long-term average removal of 80 percent TSS on an annual loading basis; and
  - Where applicable, thermal and bacteriological impacts will be mitigated, as required.
- The SWM design will be designed to follow a treatment train approach providing multiple barriers of quality control, where feasible.

- Water balance management:
  - Water Balance criterion is based on the TRCA SWM Criteria:
    - The TRCA SWM Criteria indicates that site specific water balance analyses may be required.
- Erosion and sediment control:
  - Erosion control will be in accordance with the TRCA SWM Criteria:
    - Retain 5 millimetres (mm) on site where conditions do not require detailed analysis;
    - Geomorphologic assessment study may be required to determine the site appropriate erosion threshold; and
    - Protection of water quality during construction through erosion and sediment control plans designed in accordance with the GGHACA Erosion and Sediment Control Guideline for Urban Construction, 2006.
- Drainage Design Criteria:
  - For municipal and non-railway drainage infrastructure – City of Vaughan Engineering Design Criteria and Standard Drawings (City of Vaughan, 2018a); and
  - For track drainage infrastructure - AREMA Standards ((AREMA, 2009).

A SWM Plan will be developed during the detailed design phase of the Project and will ensure that the Kirby GO Station follows the appropriate criteria.

2.5.15.2 Stormwater Management Strategy

The following are Kirby GO Station drainage and SWM facilities that will be explored for the site design to satisfy the required drainage criteria and stormwater management objectives and targets. Mitigation measures will be confirmed during the detailed design phase; however, the criteria they follow will be consistent as described above.

- SWM Quantity Control Treatment – Due to the limited areas from development of station infrastructure and the surrounding properties, SWM facilities in the form of underground storage infrastructure are recommended:
  - The treatment facilities consider the use of underground storage tank facilities, storage pipes, and/or pre-fabricated chamber systems.

- SWM Quality Control Treatment – Stormwater quality control facilities in the form of mechanical and natural treatment measures:
  - The mechanical facilities will consider, but not limited to the use of OGS units and/or CB inserts; and
  - The natural stormwater quality facilities consider, but not limited to the use of bio-swales and/or vegetated filter strips.
- Water balance treatment – Water balance targets will be satisfied using vegetated planting areas, underground storage facilities within an open bottom component, and natural quality facilities:
  - Site specific water balance assessment will be established upon further discussions with the TRCA, if required.
- Erosion and sediment control treatment – ESC targets will be established during detailed design, however the principles from the GGHACA shall be employed for the site:
  - Site specific erosion assessments will be established upon further discussions with the TRCA, if required.
- Drainage conveyance – Runoff shall be conveyed using appropriately sized storm sewers, where required. A combination of catchbasins and maintenance holes will be strategically spaced to satisfy the hydraulic requirements. Culvert structures will be sized in consultation with the TRCA and installed as required.

A Stormwater Management Report will be prepared to identify the following elements:

- Establish drainage criteria and SWM objectives to meet local and provincial requirements applicable for the Kirby GO Station;
- Identify drainage patterns, existing outfalls, delineate sub-catchments and assess conditions from the study area to the receiving environment;
- Generate hydrologic and hydraulic analysis to stimulate pre-development (existing) and proposed development flow conditions under various storm events; and
- Evaluate the drainage structures and conveyance systems within the site boundaries against the identified drainage design and SWM criteria.

2.5.16 Retaining Walls

The GO Station infrastructure is located on a terrain with a significant slope downward toward the Barrie rail corridor. This grade difference will be accommodated with grading or retaining walls.

2.5.17 Grade Separation

A grade separation is not part of the Kirby GO Station scope. The City of Vaughan has plans to undertake the Kirby Road Enviromental Assessment including a grade separation at the Barrie rail corridor tracks. In consultation with the City of Vaughan, the layout of the Kirby GO Station parking and the Kirby Road access (Access 1) have considered the potential impact of the grade separation so as to not preclude it.

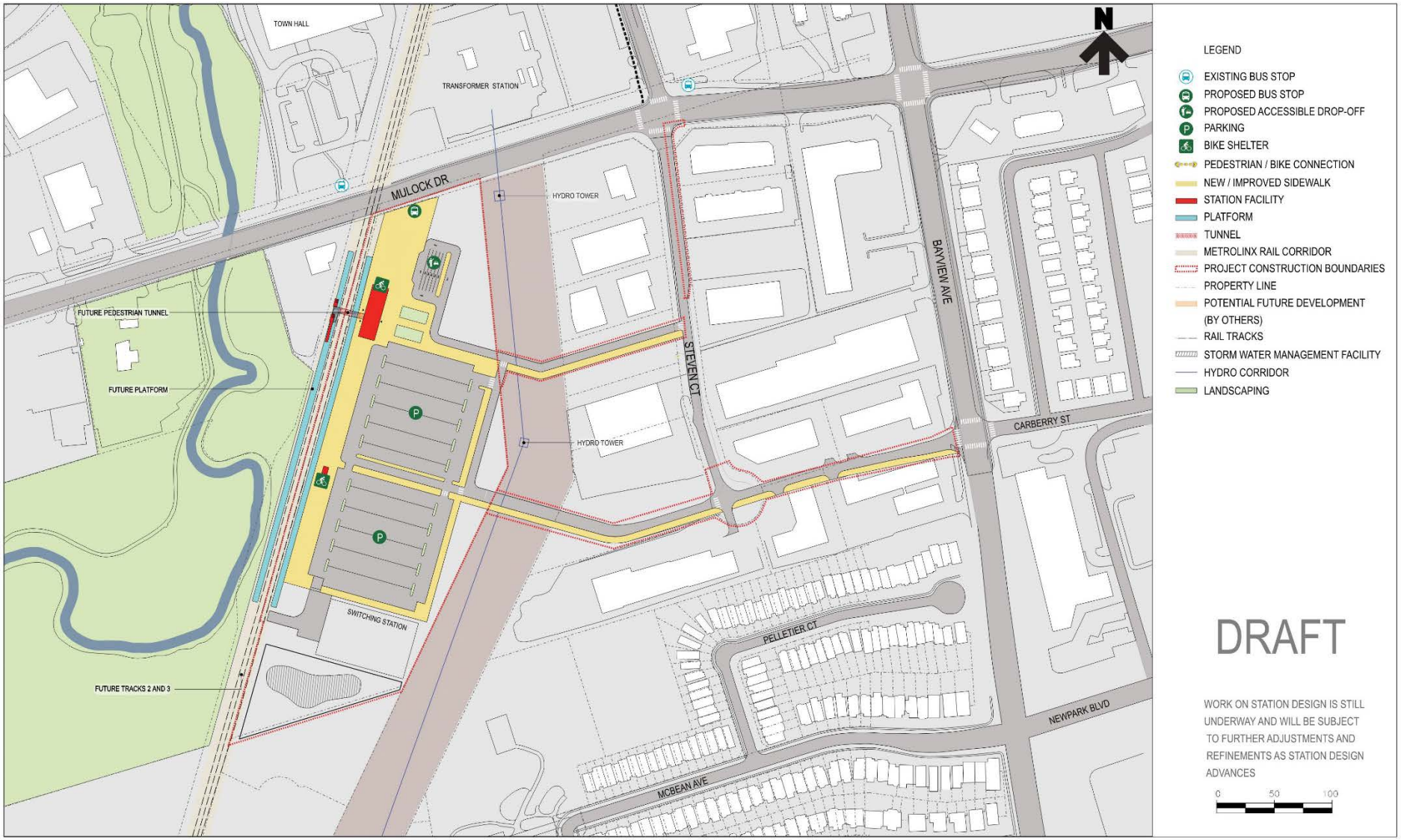
2.5.18 Connection to Barrie Rail Corridor Expansion

Track alignment at this GO Station will require coordination with the BRCE Project to accurately place the platforms and confirm the provision of a third track at this location.

The vertical track alignment in the vicinity of the GO Station may need to be re-profiled, as the track gradient varies between 1.142 percent - 1.281 percent (above the recommended one percent gradient for a station). There is also a vertical curve within the GO Station site that should be relocated. The impact of the vertical track alignment to the station layout will be assessed during detailed design.

2.6 Mulock GO Station

The Preferred Design for the Mulock GO Station is presented in Figure 2-6, including GO Station facilities and amenities.



Work on station design is still underway and will be subject to further adjustments and refinements as station design advances.

Figure 2-6: Mulock GO Station – Preferred Design

2.6.1 Platform

The Mulock GO Station will include two side platforms with one pedestrian tunnels providing access to the west platform, located south of Mulock Drive.

2.6.2 Station Entrances

There will be two GO Station access structures including a main GO Station building to the east of the rail corridor south of Mulock Drive and a smaller building aligned with the Carberry Street access road on the east side of the rail corridor.

A primary GO Station entrance will be located near the north end of the platform, adjacent to the PPUDO with access points on the east side of the rail corridor. The location of the primary entrance will lie adjacent to the PPUDO, bus loop and lay-by, and the parking facilities, and will include two bike shelters east of the rail corridor. A secondary entrance has no access points.

2.6.3 Station Circulation

GO Station circulation is designed with principles of universal accessibility in mind. A pedestrian tunnel will link the east and west platforms, and include stairs and elevators. Stairs will be enclosed or covered. The GO Station will also facilitate neighbourhood connectivity across the rail corridor. Tunnel entrances will be aligned with active transportation networks.

2.6.4 Bicycle Facilities

Three bicycle parking areas will be provided on the east side of the rail corridor, near the GO Station entrances. There will be two covered bike shelters.

2.6.5 Landscaping and Streetscaping

As per Figure 2-6, landscaping and streetscaping has been identified at a high level. The number, location, and impact to sight lines of the landscaping strategy will be further investigated during detailed design.

2.6.6 Transit Access

Existing public transit is provided by York Region and includes VIVA, Express, and Regular bus routes. Other agencies providing bus service in the area include GO Transit (Triplinx, 2017). Current routes that run in the Mulock study area and could connect transit users to the station include the following:

- 54 Northbound/Southbound Bus;
- 420 Eastbound/Westbound Bus;
- 057A Eastbound/Westbound Bus;
- 57 Northbound/Southbound Bus;
- 423 Eastbound/Westbound Bus;
- 520 Eastbound/Westbound Bus; and
- 521 Eastbound/Westbound Bus.

The York Region TMP includes a Proposed 2041 Transit Network, which includes a rapid transit corridor up Yonge Street from the City of Toronto (Steeles Avenue) to the Town of Newmarket, within the Mulock study area, and as a frequent transit network expansion north

of the Town of Newmarket. A YRT highway bus service is planned from the City of Toronto up to the Town of Georgina crossing through the eastern limits of the Town of Newmarket (York Region, 2016a).

Metrolinx plans to provide bus service to supplement the train service to this station through the provision of the following:

- Overnight buses with bidirectional service on an hourly basis between 11:00 P.M. and 5:00 A.M.; and
- Counterpeak direction buses at a 30-minute service frequency during morning and afternoon peak periods.

The Mulock GO Station has been designed to integrate existing public transit through inclusion of a bus layby on the station site.

2.6.7 Active Transportation Access

The Mulock GO Station will allow connectivity with sidewalks to Steven Court and to Bayview Avenue through the Carberry Street extension. No connections to existing trails including the Nokiidaa/Tom Taylor Trail are planned as part of the Project.

2.6.8 Vehicular Access

There will be two access roads to the east of the GO Station: one in the north that connects to Steven Court, and a second in the south that extends past Steven Court to connect to the existing Bayview Avenue/Carberry Street intersection, which includes vehicular lanes, and pedestrian and cyclist access. There will be modifications to the Steven Court/Kent Drive intersection at Mulock Drive to include the addition of vehicular turning lanes as part of the Mulock GO Station design.

2.6.9 Accessible Loading and Unloading

The GO Station will provide a PPUDO area for motorists. Parking areas will be constructed to accommodate 700 vehicles. Lots will provide priority for accessible parking, car sharing and carpooling.

2.6.10 Emergency Service/Corridor Access

Emergency service vehicles (i.e., Fire, Police, and Ambulance) will be able to utilize an internal circulation route within the parking lot to reach any part of the GO Station site, excluding the rail corridor and GO Station platforms. As multiple accesses to the GO Station site are provided via Steven Court and Carberry Street, vehicles will be able to exit Mulock GO Station even if one of these accesses is obstructed in case of an emergency.

2.6.11 Property Acquisition

The information in this section reflects property acquisition data dated January 22, 2018. Land acquisition will total approximately 0.3 ha of land zoned as commercial and 8.6 ha of land zoned as employment land.

2.6.12 Utilities

The following utilities have been identified based on the information extracted from record drawings.

- Power, Cables, Conduits and Lighting: Unknown, to be determined (TBD);

- Gas and Oil: Enbridge Gas Distribution;
- Communications: Bell Canada, Rogers Cable Communications; and
- Municipal services: watermains, sanitary sewers, storm drainage: City of Vaughan.

Twenty-two potential utility conflicts were identified by Metrolinx for the proposed Mulock GO Station footprint (13 private and nine municipal). The potential utility conflicts are all in relation to existing utilities and comparing the utility locations to the GO Station infrastructure (A. Gallardo, personal communication, October 19, 2017). A breakdown of the utility conflicts is presented in Table 2-4. Metrolinx will take the appropriate measures for conflict resolution with the utility owners.

Table 2-4: Potential Utility Conflicts Identified by Metrolinx

Total Number	Utility Type	Utility Owner	Quantity
13	Private	Bell	6
		Gas	2
		Rogers	5
9	Municipal	Sanitary	2
		Storm	4
		Water	3

2.6.13 Electrification

The layout of the Mulock GO Station accounts for the inclusion of OCS poles and the Switching Station (SWS) identified by the Electrification EA. Metrolinx will confirm the location of the OCS poles during detailed design.

2.6.14 Construction Staging/Laydown Areas

The potential staging areas may be within the properties located in the southeast corner of the Barrie rail corridor crossing at Mulock Drive. The driveway access at 402 Mulock Drive (the proposed site of the GO Station) is expected to serve as the primary access/egress route for construction vehicles. If a new vehicular connection is deemed feasible via Steven Court, it may also serve as a construction access.

2.6.15 Stormwater Management

2.6.15.1 Drainage Criteria and Stormwater Management Objectives

Drainage design criteria for the Mulock GO Station have been developed to provide the framework for safe and functional conveyance of storm runoff from the site. The criteria were developed from the Lake Simcoe Region Conservation Authority's (LSRCA) Technical Guidelines for Storm Water Management Submissions (LSRCA, 2016), and the Town of Newmarket Engineering Design Standards and Criteria, (Town of Newmarket, 2015), which are summarized as follows:

- SWM quantity control:
  - In accordance with the LSRCA and Town of Newmarket requirements:
    - Site facility development is to be designed to reduce post-development peak flows to the pre-development flow for the two-year up to the 100-year storm service.

- SWM quality control:
  - Quality Control criterion is based on the LSRCA's technical guidelines:
    - Consideration for providing enhanced Level 1 treatment through the long-term removal of 80 percent TSS from all storm water runoff prior to discharge from the site boundaries.
  - The SWM design will be designed to follow a treatment train approach providing multiple barriers of quality control, where feasible.
- SWM volume control:
  - As per the LSRCA technical guidelines, the current study falls under the nonlinear re-development (existing land use industrial) project for stormwater management requirements. The following are the LSRCA non-linear re-development requirements for Low Impact Development (LID)/Best Management Practice (BMP) treatment:
    - Site that creates 0.5 or more hectares of new and/or fully reconstructed impervious surfaces shall capture and retain/treat on site the runoff from a 25 mm rainfall event from the new and/or fully reconstructed impervious surfaces.
- Water balance management:
  - Water Balance criterion is based on the LSRCA technical guidelines:
    - SWM plan must be developed to maintain the pre-development infiltration rates.
- Floodplain storage:
  - The site development will maintain current levels of floodplain storage and match corresponding flood elevations for the two-year to the Regional storm events, where feasible.
- Erosion and sediment control:
  - In accordance to LSRCA Technical Guidelines, the proposed design requires the runoff from a 25 mm design storm (four-hour, Chicago distribution) be detained and released over a period of at least 24 hours.
- Drainage Design Criteria:
  - For municipal and non-railway drainage infrastructure - Town of Newmarket Engineering Design Standards and Criteria (Town of Newmarket, 2015); and,
  - For track drainage infrastructure - AREMA Standards (AREMA, 2009).

A SWM Plan will be developed during the detailed design phase of the Project and will ensure that the Mulock GO Station follow the appropriate criteria.

2.6.15.2 Stormwater Management Strategy

The following are the Mulock GO Station drainage and SWM facilities that will be explored for the site design to satisfy the required drainage criteria and stormwater management objectives

and targets. Mitigation measures will be confirmed during the detailed design phase, however the criteria they follow will be consistent as described above:

- SWM Quantity Control Treatment – SWM facilities in the form of a stormwater management wet pond:
  - The treatment facilities consider the use of a wet pond stormwater management facility servicing the overall Mulock GO Station.
- SWM Quality Control Treatment – Stormwater quality control facilities in the form of mechanical and natural treatment measures:
  - The mechanical facilities will consider, but not limited to the use of OGS units and/or CD inserts; and
  - The natural stormwater quality facilities consider, but not limited to the use of bio-swales, stormwater management wet ponds and/or vegetated filter strips.
- SWM volume control treatment – Volume control through infiltration (LIDs) will be provided through a variety of SWM treatment facilities:
  - The treatment facilities include the potential use of vegetated filter strips, vegetated landscaped areas, and/or bio-retention type facilities, which provide a balance of 25mm for the site re-development.
- Water balance treatment – Water balance targets will be satisfied using vegetated planting areas, wet pond stormwater management facility, and natural quality facilities;
- Floodplain storage – Develop a mitigation strategy for impacting the channel:
  - Site specific floodplain storage mitigation strategy will be established upon further discussions with the LSRCA, if required.
- Erosion and sediment control treatment – ESC targets will be established during detailed design, however the principles from the LSRCA shall be employed for the site; and
- Drainage conveyance – Runoff shall be conveyed using appropriately sized storm sewers, where required. A combination of catchbasins and maintenance holes will be strategically spaced to satisfy the hydraulic requirements. Culvert structures will be sized and installed as required.

A Stormwater Management Report will be prepared to identify the following elements:

- Establish drainage criteria and SWM objectives to meet local and provincial requirements applicable for the Mulock GO Station;
- Identify drainage patterns, existing outfalls, delineate sub-catchments and assess conditions from the study area to the receiving environment;
- Generate hydrologic and hydraulic analysis to stimulate pre-development (existing) and proposed development flow conditions under various storm events; and
- Evaluate the drainage structures and conveyance systems within the site boundaries against the identified drainage design and SWM criteria.

2.6.16 Retaining Walls

A retaining wall adjacent to the East Holland River on the west side of the future west platform will be confirmed as the design progresses. A retaining wall north of Mulock Drive and east of the east track, falling within the Barrie rail corridor ROW may be required and this will be confirmed during detailed design.

2.6.17 Grade Separation

A grade separationof Mulock Drive is not part of the Mulock GO Station scope. The Station design has been developed to not preclude a future grade separation by setting station facilities back from Mulock Drive.

2.6.18 Connection to Barrie Rail Corridor Expansion

Track alignment at this GO Station will require coordination with the BRCE Project in order to accurately locate the platforms and confirm the provision of a third track at this location.

2.7 Innisfil GO Station

The Preferred Design for Innisfil GO Station is presented in Figure 2-7 including GO Station facilities and amenities.

Work on station design is still underway and will be subject to further adjustments and refinements as station design advances.

Figure 2-7: Innisfil GO Station – Preferred Design

2.7.1 Platform

The Innisfil GO Station will include two side platforms with one pedestrian tunnel providing access to the platform from 6th Line and the future developments to the north and east of the GO Station site.

2.7.2 Station Entrances

A primary GO Station entrance will be located near the center of the platform, with access points on the west and east side of the rail corridor. There will be two GO Station access structures including a main GO Station building to the west of the rail corridor along with one pedestrian tunnel providing access across the corridor to future developments to the east of the GO Station site.

The location of the primary entrance will lie adjacent to the PPUDO and north parking facilities, and will include covered and secure bicycle parking. The entrance will be close to 6th Line for more efficient bus-rail pedestrian connectivity and to facilitate passenger transfer between bus stops and other modes.

2.7.3 Station Circulation

GO Station circulation is designed with principles of universal accessibility in mind. A primary vehicular access from a signalized intersection with 6th Line will include vehicular lanes, and pedestrian and cyclist access. One tunnel will link the east and west platforms, and include stairs and elevators.

The GO Station will also facilitate neighbourhood connectivity across the rail corridor. Tunnel entrances will be aligned with active transportation networks.

A new signalized intersection and road provides bus and vehicle entry off 6th Line, with a bus loop and a PPUDO located adjacent to the main GO Station building and the south GO Station entrance.

2.7.4 Bicycle Facilities

Three bicycle parking areas are proposed on both sides of the rail corridor, near the GO Station entrances. There will be two bike shelter locations.

2.7.5 Landscaping and Streetscaping

As per Figure 2-7, landscaping and streetscaping has been identified at a high level. On the west side of the north south access road from 6th Line, a row of trees will screen the heritage property. The number, location, and impact to sight lines of the landscaping strategy will be further developed during detailed design.

2.7.6 Transit Access

A local municipal (public) fixed-route transit service is not provided in the Town of Innisfil. As such, there are no transit routes or stops within the Innisfil study area that could connect transit users to the station. However, the Town and Uber Technologies Inc. (Uber) are currently working collaboratively to provide reliable, affordable, on-demand transit to service all residents of Innisfil. Uber is municipally subsidized by the Town of Innisfil, however classified as microtransit, given the different type of vehicle as compared to a typical local transit vehicle. This is the first ridesharing and transit partnership in Canada. Uber and the Town of Innisfil have identified a set fee for certain rides throughout the Town, which range in price from three

to five dollars. The municipal program has been underway since May 2017 (Town of Innisfil, 2017a).

In May 2018, the Town of Innisfil adopted the Transportation Master Plan (TMP) Update to plan for growth to the year 2041. Given the anticipated population and employment growth, there are issues, challenges and opportunities in planning for the future. The recommended strategy includes key roadway connections, the implementation of active transportation improvements, parking standard reviews, dockless bike share services, as well as a plan for fixed route transit to build on the existing demand-response transit service already in use (Town of Innisfil, 2018).

The County of Simcoe Transit is currently working towards the initial launch of Route 1 of the Linx, which is a conventional public transit system that will link major urban hubs with local transit services throughout the County of Simcoe. Future Routes will launch in the coming years, however there are no routes planned within the study area (County of Simcoe, 2018). The Innisfil GO Station was designed to accommodate future County of Simcoe Transit vehicles.

Metrolinx plans to provide bus service to supplement the train service to this station through the provision of the following:

- Overnight northbound buses on an hourly basis between 12:00 A.M. and 5:00 A.M.;
- Counterpeak direction buses at a 30-minute service frequency during morning and afternoon peak periods;
- Peak direction buses at an hourly service frequency during morning and afternoon peak periods; and
- Hourly bidirectional service during mid-day and evening periods.

The Innisfil GO Station includes four bus bays in the bus loop to accommodate both GO Transit bus service and County of Simcoe Transit buses.

2.7.7 Active Transportation Access

A new MUP is proposed from 6th Line into the station site as part of the station plan. A pedestrian/bike connection (not part of Innisfil GO Station scope) is proposed from the east access structure on the east side of the rail corridor to future development on the east side of the Innisfil GO Station, in order to accommodate pedestrians and cyclists coming from the east.

2.7.8 Vehicular Access

The Innisfil GO Station will include a primary vehicular access from a signalized intersection with 6th Line, which includes vehicular lanes, and pedestrian and cyclist access.

2.7.9 Accessible Loading and Unloading

The GO Station will include a PPUDO area for motorists. New parking areas will be constructed to accommodate 500 vehicles, including the provision for accessible parking, car sharing and carpooling.

2.7.10 Emergency Service/Corridor Access

Emergency service vehicles (i.e., Fire, Police, and Ambulance) will be able to utilize an internal circulation route within the parking lot to reach any part of the GO Station site – excluding the

rail corridor and GO Station platforms. However, access to the northern parking lot is provided by a single access, which may pose potential issues if obstructed during an emergency.

2.7.11 Property Acquisition

The information in this section reflects property acquisition data dated January 22, 2018. Property acquisition will total an estimated 6.4 ha of land zoned as agriculture and approximately 0.08 ha of land zoned as open space.

2.7.12 Utilities

The following utilities have been identified based on the information extracted from record drawings.

- Power, Cables, Conduits and Lighting: Unknown (TBD).

Three potential utility conflicts were identified by Metrolinx for the proposed Innisfil GO Station footprint (three private and zero municipal). These three potential conflicts are caused by a private unknown conductive which was found in the rail corridor alignment; Metrolinx was unable to confirm the owner of the plant at the time of writing. The potential utility conflicts are all in relation to existing utilities and comparing the utility locations to the GO Station infrastructure (A. Gallardo, personal communication, October 19, 2017). There were no potential conflicts identified with Bell, Enbridge or Rogers infrastructure at the GO Station footprint (A. Gallardo, personal communication, October 19, 2017).

A breakdown of the utility conflicts is presented in Table 2-5. Mitigation measures will be identified to address conflict resolution with the utility owners.

Table 2-5: Potential Utility Conflicts Identified by Metrolinx

Total Number	Utility Type	Utility Owner	Quantity
3	Private	CUG- Unknown	3
0	Municipal	None	

There are no existing watermains within the Innisfil study area. There are two future watermains proposed within the Innisfil study area as part of the Town of Innisfil Town-Wide Water and Wastewater Master Servicing Plan: A Zone 1 Proposed Watermain running north-south approximately 200 metres east of the Barrie rail corridor and a Zone 1 Proposed Trunk Watermain, running along 6th Line and extending across the entire Innisfil study area (Genivar, 2012).

The Town of Innisfil Master Servicing Plan Update Final Draft Report was prepared for InnServices Utilities Inc. in July 2018. The findings of this Report will be considered during detailed design.

Hydro Services in the Town of Innisfil are provided by Innpower. There are overhead hydro poles that extend along the south side of 6th Line, parallel to the road. The hydro poles cross over to the north side within the Innisfil study area.

2.7.13 Electrification

The layout of the Innisfil GO Station accounts for the inclusion of OCS poles. The location of the OCS poles will be confirmed during detailed design.

2.7.14 Construction Staging/Laydown Areas

The GO Station site can be used as its own staging area for construction of the tracks, platforms and GO Station structures, internal roads and parking areas. The proposed permanent site access of the Innisfil GO Station is expected to serve as a primary access/egress route to the GO Station and Barrie rail corridor. Alternative existing at-grade vehicular access points to the rail ROW closest to the site include accesses at 7th Line approximately 1.4 km to the north, and at Belle Aire Beach Road approximately 1.4 km to the south, although these locations are relatively far from the GO Station site. The closest highway access is at Highway 400 west of the GO Station site, with ramps at Innisfil Beach Road and 4th Line. Thus, the proposed construction haul route to these laydown area is proposed to be along 6th Line.

2.7.15 Stormwater Management

2.7.15.1 Drainage Criteria and Stormwater Management Objectives

Drainage design criteria for the Innisfil GO Station have been developed to provide the framework for safe and functional conveyance of storm runoff from the site. The criteria were developed from the LSRCA Technical Guidelines for Storm Water Management Submissions (LSRCA, 2016), and the Town of Innisfil Engineering Design Standards and Specifications Manual, (Town of Innisfil, 2011), which are summarized as follows:

- SWM quantity control:
  - In accordance with the LSRCA SWM and Town of Innisfil requirements:
    - Site facility development is to be designed to reduce post-development peak flows to the pre-development flow for the two-year up to the 100-year storm service.
- SWM quality control:
  - Quality Control criterion is based on the LSRCA's technical guidelines:
    - Consideration for providing enhanced Level 1 treatment through the long-term removal of 80 percent TSS from all storm water runoff prior to discharge from the site boundaries.
  - The SWM design will be designed to follow a treatment train approach providing multiple barriers of quality control, where feasible;
- SWM volume control:
  - As per the LSRCA technical guidelines, the current study falls under the non-linear new development (existing land use industrial) project for stormwater management requirements. The following are the LSRCA non-linear new development requirements for Low Impact Development LID/BMP treatment:
    - Site that creates 0.5 or more hectares of new impervious surfaces shall capture and retain/treat on site the runoff from a 25 mm rainfall event from the total impervious surface.
- Water balance management:
  - Water Balance criterion is based on the LSRCA technical guidelines:

- SWM plan must be developed to maintain the pre-development infiltration rates.

- Erosion and sediment control:
  - In accordance to LSRCA Technical Guidelines, the proposed design requires the runoff from a 25 mm design storm (four-hour, Chicago distribution) be detained and released over a period of at least 24 hours.
- Drainage Design Criteria:
  - For municipal and non-railway drainage infrastructure - Town of Innisfil Engineering Design Standards and Specifications Manual (Town of Innisfil, 2011); and
  - For track drainage infrastructure - AREMA Standards (AREMA, 2009).

A SWM Plan will be developed during the detailed design phase of the Project and will ensure that the Innisfil GO Station follow the appropriate criteria.

2.7.15.2 Stormwater Management Strategy

The following are the Innisfil GO Station drainage and SWM facilities that will be explored for the site design to satisfy the required drainage criteria and stormwater management objectives and targets. Mitigation measures will be confirmed during the detailed design phase, however the criteria they follow will be consistent as described above.

- SWM Quantity Control Treatment – SWM facilities in the form of a stormwater management wet pond:
  - The treatment facilities consider the use of a wet pond stormwater management facility and/or underground stormwater management facilities servicing the Innisfil GO Station.
- SWM Quality Control Treatment – Stormwater quality control facilities in the form of mechanical and natural treatment measures.
  - The mechanical facilities will consider, but not limited to the use of OGS units and/or CB inserts; and
  - The natural stormwater quality facilities consider, but not limited to the use of bio-swales, stormwater management wet ponds and/or vegetated filter strips.
- SWM volume control treatment – Volume control through infiltration (LIDs) will be provided through a variety of SWM treatment facilities:
  - The treatment facilities include the potential use of vegetated filter strips, vegetated landscaped areas, and/or bio-retention type facilities, which provide a balance of 25 mm for the site re-development.
- Water balance treatment – Water balance targets will be satisfied using vegetated planting areas, wet pond stormwater management facility, and natural quality facilities;
- Erosion and sediment control treatment – ESC targets will be established during detailed design, however the principles from the LSRCA shall be employed for the site; and

- Drainage conveyance – Runoff shall be conveyed using appropriately sized storm sewers, where required. A combination of catchbasins and maintenance holes will be strategically spaced to satisfy the hydraulic requirements. Culvert structures will be sized and installed as required.

A Stormwater Management Report will be prepared to identify the following elements:

- Establish drainage criteria and SWM objectives to meet local and provincial requirements applicable for the Innisfil GO Station;
- Identify drainage patterns, existing outfalls, delineate sub-catchments and assess conditions from the study area to the receiving environment;
- Generate hydrologic and hydraulic analysis to stimulate pre-development (existing) and proposed development flow conditions under various storm events; and
- Evaluate the drainage structures and conveyance systems within the site boundaries against the identified drainage design and SWM criteria.

2.7.16 Retaining Walls

Two retaining walls are proposed. One retaining wall would be located between the PPUDO and north parking lot, and another retaining wall would be located between the south parking lot and the adjacent existing grading along 6th Line.

2.7.17 Grade Separation

There is no grade separation as part of the scope of work for the Innisfil GO Station. The station layout accounts for the planned replacement of the 6th Line overpass over the Barrie rail corridor.

2.7.18 Connection to Barrie Rail Corridor Expansion

Track alignment at this station will require coordination with the BRCE Project in order to accurately locate the platforms as part of the Innisfil GO Station design.

3. Existing Conditions

This section of the EPR Addendum provides a summary of the existing (or baseline) conditions. The baseline conditions are broken out into the natural, cultural, and social and built environments to summarize the features within the GO Station study areas. The description of the natural environment includes details on the physical, terrestrial, aquatic and tree environments. The cultural environment includes archaeological and Cultural Heritage Resources (CHRs), while the social and built environment includes socio-economic, land use, air quality, noise and vibration, traffic and transportation infrastructure, and utilities and municipal infrastructure.

The description of the existing conditions was derived from a combination of secondary source information and on-site field investigations. In some instances, site access constraints limited the study findings. Where necessary commitments have been made to conduct additional studies, more detailed field investigations will be undertaken once Metrolinx has secured Permissions to Enter (PTEs). The information presented in this section of the EPR Addendum has been informed by the studies completed for the GO Stations, which are located in the noted

appendices to this EPR Addendum (each GO Station is assembled as Volume 2 (Spadina-Front) through Volume 6 (Innisfil), with the Technical Reports in the following order within each GO Station volume):

- Appendix A – Initial Preferred Design (Spadina-Front GO Station) or Preferred Design (Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations);
- Appendix B – Natural Environment Report
- Appendix C – Tree Inventory Plan;
- Appendix D – Stage 1 Archaeology Assessment;
- Appendix E – Cultural Heritage Studies;
- Appendix F – Socio-Economic and Land Use Study;
- Appendix G – Air Quality Impact Assessment;
- Appendix H – Noise and Vibration Impact Assessment; and
- Appendix I – Transportation and Traffic Impact Analysis (Transportation Brief only for Spadina-Front GO Station).

3.1 Physical Environment

3.1.1 Methodology

For the Physical Environment includes landform and physiography, soil and bedrock geology, and groundwater. Topographic, surficial geology and bedrock geology mapping available through Natural Resources Canada and the Ontario Geological Survey (OGS), as well as other relevant background documentation was reviewed.

In addition to source water protection mapping from the Government of Ontario, the following sources were reviewed to confirm and source water protection areas within the GO Station study areas:

- Spadina-Front - Approved Source Water Protection Plan for the Credit Valley, Toronto and Region and Central Lake Ontario (CTC) Source Water Protection;
- Bloor-Lansdowne GO Stations - CTC Source Water Protection Area;
- Kirby GO Station – CTC Source Water Protection Area, online mapping from the City of Vaughan and York Region;
- Mulock GO Station - South Georgian Bay Lake Simcoe Source Protection Plan, Town of Newmarket OP; and
- Innisfil GO Station - South Georgian Bay Lake Simcoe Source Protection Plan, online-mapping from the Town of Innisfil and the County of Simcoe, and Lake Simcoe and Couchiching – Black River Source Protection Area.

3.1.2 Landform and Physiography

3.1.2.1 *Spadina-Front and Bloor-Lansdowne GO Stations*

The Spadina-Front and Bloor-Lansdowne study areas are located in the Iroquois Plain physiographic region (Chapman and Putman, 1984).

The Iroquois Plains are characterized by cliffs, bars, beaches, boulder pavements, and undulating till planes that are remnants of glacial Lake Iroquois. Where the two station study areas are located, the surviving portion of the bed of Lake Iroquois is a slightly sloping plain with an average width of about two miles. In some areas it is covered with stratified sands of varying depth, or the soil is formed directly on the wave-eroded surface of the red shale or a shallow cover of till remains over the bedrock (Chapman and Putman, 1984). The Spadina-Front and Bloor-Lansdowne study areas generally slope northwest to southeast towards Lake Ontario and the Don River.

The two station study areas lie in the Mixedwood Plains Ecozone, in the Lake Erie-Lake Ontario Ecoregion (Ecoregion 7E) (Crins *et al*., 2009). This Ecoregion covers approximately 2.2 percent of Ontario, spreading from Windsor and Sarnia east to the Niagara Peninsula and Toronto. The climate is hot and moist in the summer and cool in the winter, with a mean annual temperature range of 6.3 to 9.4 degrees Celsius. This Ecoregion is comprised primarily of land converted for pasture and agricultural uses (~78 percent) and urban/developed land (~7 percent). Forest cover in the remaining areas consists primarily of dense deciduous (10.3 percent), sparse deciduous (~1 percent), and mixed deciduous forest (Crins *et al*., 2009).

3.1.2.2 *Kirby GO Station*

The Kirby study area is located in the South Slope physiographic region (Chapman and Putman, 1984). The South Slope region is characterized by relatively impermeable drumlinized till plains formed by glacial deposition and scarification over the past 20,000 to 150,000 years. Topographically, the Kirby study area slopes from the northeast to the southwest and the western branch of the Don River runs along the southern boundary of the property.

The Kirby study area consists of Halton Till (4T, 2017a). The property lies in the Mixedwood Plains Ecozone, within the Lake Simcoe-Rideau Ecoregion (Ecoregion 6E) (Crins *et al.,* 2009). The climate is mild and moist, with a mean annual temperature range of 4.9 to 7.8 degrees Celsius. The land cover is/was predominantly cropland, pasture and abandoned fields. Forested areas include deciduous, coniferous and mixed forest types. The Kirby study area is located within the Great Lakes-St. Lawrence Forest Region (Rowe, 1972).

3.1.2.3 *Mulock GO Station*

The Mulock study area is located in the Schomberg Clay Plains physiographic region (Chapman and Putman, 1984). The Schomberg Clay Plains region is characterized by basins running along the northern slopes of the Oak Ridges Moraine (ORM) which contain deep stratified clay and silt. The Newmarket area is characterized by drumlinized till plains beneath the clay. The average depth of the clay is fifteen feet and is composed of varied clay layers that consist of a silty clay loam, which is well drained. The Mulock study area is within the Holland River watershed. The river flows generally north and drains into Cook's Bay (Chapman and Putman, 1984). Within the Mulock study area, the Holland River is west of the new Mulock

GO Station, and it flows through Bailey Ecological Park north into Wesley Brook Memorial Conservation Area.

Topographically, the Mulock study area consists of gently sloping lands towards the northwest. Within the Mulock study area are glaciolacustrine deposits consisting of clay and silt with additional fluvial deposits consisting of silt and sand, Newmarket Till and organic deposits (4T, 2017b). The property lies in the Mixed Woodland Ecozone, within the Lake Simcoe-Rideau Ecoregion (Ecoregion 6E) (Crins *et al*., 2009). Climatic and geological characteristics for this ecoregion are provided below, along with a brief description of dominant vegetation and wildlife species. The climate is mild and moist, with a mean annual temperature range of 4.9 to 7.8 degrees Celsius. The land cover is/was predominantly cropland, pasture and abandoned fields. Forested areas include deciduous, coniferous and mixed forest types. The Mulock study area is located within the Great Lakes-St. Lawrence Forest Region (Rowe, 1972).

3.1.2.4 Innisfil GO Station

A portion of the Innisfil study area is located in the clay plains of the Simcoe Lowlands physiographic region primarily consisting of sedimentary bedrock overlain by glacial, fluvial, and lacustrine clay sediments (Chapman and Putman, 1984). The majority of the Innisfil study area is located within the Peterborough Drumlin Fields physiographic region which consists primarily of a limestone bedrock beneath the calcareous till that covers most of the region (Chapman and Putman, 1984).

The Innisfil study area consists of fairly level farm fields that slope from the northwest to the southeast. The property lies in the Ontario Shield Ecozone, within the Georgian Bay Ecoregion (Ecoregion 5E) (Crins *et al*., 2009). The Innisfil study area is located within the Great Lakes-St. Lawrence Forest Region (Crins *et al*., 2009).

3.1.3 Soil and Bedrock Geology

Soil and bedrock geology of all stations is presented in Table 3-1. Soil type was based on the surficial geology of Southern Ontario mapping, and soil permeability was based on surficial geology (OGS, 2010). Bedrock classification was based on the bedrock geology mapping of Ontario (OGS, 1991).

Table 3-1: Summary of Soil and Bedrock Geology

Station	Soil	Bedrock Classification
Spadina-Front	Glacial ice deposits and consist of young tills, generally clayey silt tills and sandy silt till.	Upper Ordovician shale, limestone, dolostone and siltstone of the Georgian Bay Formation.
Bloor-Lansdowne	Glacial lake deposits and consist of Lake Iroquois shallow water deposits, generally sand tills and silty sand till.	Characteristic of the Mid-Ordovician period containing limestone, dolostone, shale, arkose, and sandstone.
Kirby	Till plains physiographic landform. Soils in the vicinity of the Kirby study area consist mostly of clay and silt-textured till (derived from glaciolacustrine	Bedrock geology is characteristic of the Mid-Ordovician period containing limestone, dolostone, shale, arkose, and sandstone.

Station	Soil	Bedrock Classification
	deposits or shale) from the Pleistocene era.	
Mulock	Formed from glacial till, which is a conglomeration of rock, sand, and clay.	Bedrock geology in the area is characteristic of the Mid-Ordovician period containing limestone, dolostone, shale, arkrose, and sandstone.
Innisfil	Flat, low-lying area within an ancient beach associated with the former Lake Algonquin and is primarily a level plain with deep deposits of sand and silt.	Bedrock is from the Mid-Ordovician period containing limestone, dolostone, shale, arkose, and sandstone.

3.1.4 Groundwater

3.1.4.1 Spadina-Front GO Station

The Spadina-Front study area does not contain any Wellhead Protection Areas (WHPA), intake protection zones, or significant groundwater recharge areas. It is within a highly vulnerable aquifer area, as is much of the province (CTC Source Water Protection Plan, 2015).

3.1.4.2 Bloor-Lansdowne GO Station

The Bloor-Lansdowne study area does not contain any mapped WHPAs, intake protection zones, or significant groundwater recharge areas. The Bloor-Lansdowne study area is within a highly vulnerable aquifer area (CTC Source Water Protection Plan, 2015).

3.1.4.3 Kirby GO Station

The Kirby GO Station study area is within a Recharge Management Area (WHPA-Q), where activities that reduce recharge may represent a threat to groundwater. As such, the TRCA and MOECC will be consulted during the detailed design phase of the Kirby GO Station with respect to Recharge Management and Demand (York Region, 2017).

Staining and groundwater discharge associated with the PSW located to the west of the Kirby study area were identified. Additionally, a small groundwater seep was identified outside of PSW limits during field investigations. The seep is located between the western PSW and the Barrie rail corridor and contributes to the quality and quantity of water within the surrounding PSW.

3.1.4.4 Mulock GO Station

The Mulock study area falls within a WHPA (South Georgian Bay Lake Simcoe Source Protection Region, 2015). The Mulock study area falls within a Wellhead Protection Area D (WHPA-D) as identified on Schedule G of the Town of Newmarket OP (2006). The WHPA-D is characterized with a 10 to 25-year time of travel. A WHPA-Q was also identified within the study area. Within areas classified as WHPA-Q activities that reduce recharge represent a water quantity threat. Therefore, the Recharge Management and Demand policies in the Source Protection Plans apply to the sites. The LSRCA and MOECC will be consulted during the detailed design phase of the Mulock GO Station with respect to Recharge Management and

Demand Regardless of the approval required, the applicant should maintain recharge at the sites to the extent feasible.

3.1.4.5 Innisfil GO Station

The Innisfil study area does not contain any mapped WHPAs, intake protection zones, highly vulnerable aquifers, or significant groundwater recharge areas. There are no source water protection vulnerable areas present within the Innisfil study area (South Georgian Bay Lake Simcoe Source Protection Region, 2015).

3.2 Aquatic Environment

3.2.1 Methodology

Available background information was collected and reviewed from several sources, including but not limited to Fisheries and Oceans Canada (DFO), the MNRF, the LSRCA and the TRCA.

Aquatic investigations examined the Don River West Branch Subwatershed and the East Holland River and focused on describing general habitat and documenting habitat features. Fish habitat information was collected where feasible and relevant.

3.2.2 Watersheds and Subwatersheds

The GO Station study areas span across the regulated area of both the TRCA in the south and LSRCA in the north. Hydrologically the major watercourses located within the TRCA regulated lands generally flow south towards Lake Ontario, while the major watercourses within the LSRCA regulated lands generally flow north towards Lake Simcoe. The major watersheds and subwatersheds in each study area are summarized in Table 3-2.

Table 3-2: Major Watersheds and Subwatersheds in the Project Study Area

Major Watershed or Subwatershed	Applicable Conservation Authority
Spadina-Front GO Station	
-	-
Bloor-Lansdowne GO Station	
-	-
Kirby GO Station	
Upper West Don River Subwatershed	TRCA
Mulock GO Station	
East Holland River Subwatershed	LSRCA
Lake Simcoe Watershed	LSRCA
Innisfil GO Station	
Innisfil Creeks Subwatershed	LSRCA

Upper West Don River Subwatershed (Kirby GO Station)

The Upper West Don River Subwatershed land use is characterized by residential development and greenfield development. Being vulnerable to anthropogenic pressure, the watershed requires effective management to protect, enhance, and expand the high quality terrestrial habitat it offers.

East Holland River Subwatershed (Mulock GO Station)

The East Holland River Subwatershed land use is characterized as 52.9 percent agriculture, 23.1 percent urban, and 19.1 percent forested (LSRCA, 2000). Being heavily affected by human intervention, the watershed requires close attention to the protection, enhancement, and expansion of its remaining natural systems and water quality (LSRCA, 2000).

Lake Simcoe Watershed (Mulock GO Station)

The Lake Simcoe Watershed land use is characterized as 8 percent urban land, 13 percent wetland, 13 percent forest, 20 percent Lake Simcoe and as 36 percent agricultural land. This watershed covers approximately 3,400 square kilometres and contains 18 subwatersheds including the East Holland River Subwatershed (LSRCA, 2018).

Innisfil Creeks Subwatershed (Innisfil GO Station)

Land use in the Innisfil Creeks Subwatershed is currently dominated by agriculture, which occupies 45 percent of the subwatershed area. Natural heritage cover accounts for 33 percent of the subwatershed. Developed land accounts for approximately 14 percent of the land use; while the remaining area includes rural development, roads and railways, golf courses, and aggregate operations. This area has undergone fairly significant change in recent years, with the urban area expected to continue to expand (LSRCA, 2012).

3.2.3 Aquatic and Fish Habitat

3.2.3.1 Spadina-Front GO Station

There are no watercourses or hydrological features in the Spadina-Front study area. Lake Ontario is located approximately 700 metres south of the Spadina-Front study area.

3.2.3.2 Bloor-Lansdowne GO Station

There are no watercourses present within the Bloor-Lansdowne study area. However, Spring Creek, on the east side of High Park, is approximately 1.2 km west of the Bloor-Lansdowne study area and Black Creek is approximately 1.6 km northwest of the Bloor-Lansdowne study area. Spring Creek discharges into Lake Ontario, approximately 3.2 km from the Bloor-Lansdowne study area, with majority of its volume flow being stormwater from a 250 ha catchment area north and northeast of High Park (High Park Nature, 2013). Black Creek discharges into the Humber River, approximately four km from the Bloor-Lansdowne study area, and ultimately outlets into Lake Ontario.

3.2.3.3 Kirby GO Station

The Don River West Branch Subwatershed is characterized as urbanized, largely built up and paved over (TRCA, 2013). The Don River West Branch headwater originates from the ORM approximately 250 metres northeast of the Kirby study area (TRCA, 2009).

The subwatershed is dominated by cool – warm water generalist species with a tolerant range of habitat conditions. Species found in the Upper West Don River Subwatershed identified by the TRCA include: Brown Bullhead (*Ameriurus nebulosus*), Common Carp (*Cyprinus carpio*), Largemouth Bass (*Micropterus salmoides*), Northern Pike (*Esox lucius*), Pumpkinseed (*Lepomis gibbosus*), Rock Bass (*Ambloplites rupestris*), and Yellow Perch (*Perca flavescens*) (TRCA, 2009). TRCA's fishery objectives within the study area focus on the management of Blacknose Shiner (*Notropis heterolepis*), Northern Redbelly Dace (*Chrosomus eos*) and Johnny Darter (*Etheostoma nigrum*) populations.

No aquatic Species at Risk (SAR) were identified through correspondence with the MNRF (M. Shapiera, personal communication, October 25, 2017). Fish-dot information provided by the MNRF, indicates the sampling was completed in the summer of 2005 at a pond 250 metres southwest of the study area. At this time, the pond is described as having water that was still and turbid, submerged vegetation and sparse cover at the shore and in water. The bottom type consisted of 30 percent silt and 70 percent clay.

Initial field investigations were limited due to the lack of PTEs received, although it is assumed that fish habitat is present within the study area.

Downstream of the Kirby GO Station

South of the Kirby study area limits, the Don River West Branch main branch and tributary meet and continue to flow south towards Lake Ontario, through the Don River West Branch Headwater PSW complex.

Kirby GO Station

A tributary of the Don River West Branch meanders through the southern extent of the Kirby study area. Approximately 150 metres west of Keele Street, two intermittent streams feed into the tributary and head south towards the main branch. The two intermittent streams were assessed during field investigations. Watercourse definitions followed the Ministry of Natural Resources and Forestry (MNRF) Stream Permanency Handbook for South Central Ontario (Irwin *et al.,* 2013) as outlined in Table 3-3.

Table 3-3: Watercourse Definitions

Permanency	Ephemeral Characteristic	Intermittent	Permanent
Stream Flow	Flow for days to weeks following spring snow melt or a major rain event	Flow for several weeks following snowmelt, during wet seasons and after a major rain event	Flow for most of the year, but may stop flowing during drought conditions in July and August
Defined Stream Bottom	Stream bottom is not defined except on steep slopes Top soil and root mat forms the stream bottom Scoured or darkened duff layer	Stream bottom is defined and appears scoured from underlying ground Sorted erodible material may be present	Stream bottom is defined and appears scoured from underlying ground Sorted erodible material is common

Permanency	Ephemeral Characteristic	Intermittent	Permanent
Prominent Banks	Prominent banks are absent	Prominent banks are absent, or if present, not continuous along stream length	Prominent banks are present and continuous along stream length
Supporting Criteria	Terrestrial plants are common throughout stream bottom Aquatic invertebrates are absent	Terrestrial plants may be present on stream bottom Aquatic invertebrates are rare but may be present near seeps or under wetted rocks on stream bottom	Terrestrial plants are absent on stream bottom Aquatic invertebrates are common throughout stream bottom

Based on the criteria in Table 3-3, the two intermittent streams were re-classified as grassed swales. Both swales have an undefined stream bottom with top soil and root mat making up the stream bottom. There were no prominent banks observed within the swale. During the spring and summer 2017 field investigations, minimal flow was observed. Additional field investigations are planned for 2018 to further characterize aquatic habitat and the presence/absence of fish species, as discussed in Section 4.3.1 of this EPR Addendum.

Upstream of the Kirby GO Station

Upstream (and to the northeast) of the Kirby study area, the Don River West Branch is located approximately 230 metres west of the Oak Ridge Moraine. Outside of the Kirby study area the river flows south through the Don River West Branch Headwater Wetland Complex PSW towards Lake Ontario (Photograph 3-1). Additional field investigations may be required to further characterize aquatic habitat and the presence/absence of fish species.

Photograph 3-1: View of Provincially Significant Wetland (MAM) Unit 14 from Keele Street

3.2.3.4 Mulock GO Station

The East Holland River and many of its tributaries originate within the ORM. The East Holland River flows through woodlands, wetlands, industrial areas, agricultural fields, and golf courses, and is characterized as an urban and degraded system (LSRCA, 2000).

The Lake Simcoe Watershed is dominated by cool – warm water generalist species with a tolerant range of habitat condition. Species found in the East Holland River and around the mouth of the river, as identified in MRNF's Fish ON-Line database include: Black Crappie (*Pomoxis nigromaculatus*), Bowfin (*Amia calva*), Brown Bullhead (*Ameriurus nebulosus*), Common Carp (Cyprinus carpio), Largemouth Bass (*Micropterus salmoides*), Northern Pike (*Esox lucius*), Pumkinseed (*Lepomis gibbosus*), Rock Bass (*Ambloplites rupestris*), White Sucker (*Catostomus commersonii*), and Yellow Perch (*Perca flavescens*).

No aquatic SAR were identified through correspondence with the MNRF (M. Shapiera, personal communication, October 25, 2017). Fish-dot information gathered in the vicinity of the Mulock study area, provided by the MNRF, indicates the presence of warm water generalist species. Additionally, fish habitat was identified west of the Barrie rail corridor where the East Holland River meanders through the Mulock study area (Photograph 3-2).

Downstream of Mulock GO Station: North of the GO Station footprint, the downstream reach of the East Holland river is characterized as having prominent banks that are present and continuous; banks are vegetated with grasses and common forb species (Photograph 3-3). Terrestrial plants are absent from the stream bottom. The stream bottom is defined and

appears scoured from underlying ground. Large willows extend over the water with dead/broken limbs within the water, providing fish habitat.

Mulock GO Station: Immediately west of the Mulock GO Station footprint and within the Mulock study area, prominent banks are present along the river, and are vegetated with grass, forb and wetland species; large willows extend over the water with dead/broken limbs. Terrestrial plants are absent from the defined stream bottom. During field investigations, an intermittent stream was observed branching from the East Holland River towards the culvert at Mile 32.40 and flowing east of the corridor from Dennis Park.

Upstream of Mulock GO Station: South of the Mulock GO Station footprint and within the Mulock study area, the upstream East Holland River meanders through Bailey Ecological Park, and St. Andrew's Valley Golf Club. Similar habitat was observed with prominent and highly vegetated banks. Terrestrial plants are absent from the defined stream bottom.

Photograph 3-2: East Holland River Meandering Through the Mulock Study Area

Photograph 3-3: East Holland River, Downstream of the Mulock GO Station

3.2.3.5 *Innisfil GO Station*

A records review indicates that a former ephemeral agricultural drainage swale once existed within the Innisfil study area. However, based on the observations from the preliminary field investigations, the drainage swale no longer exists. The current review of background information did not identify any areas of natural significance within the Innisfil study area. South of the Innisfil study area, the Barrie rail corridor crosses Belle Aire Creek at Mile 53.28. This watercourse is classified as a Type A municipal drain within the Innisfil Creeks Subwatershed Plan (LSRCA, 2012a). As there are no aquatic habitat features in the Innisfil study area, further aquatic investigations were not conducted.

3.3 Terrestrial Environment

3.3.1 Methodology

During preparation of the EPR for the BRCE Project (Metrolinx, 2017b), vegetation communities were mapped and classified in accordance with the Ecological Land Classification (ELC) for Southern Ontario (Lee, *et al.,* 1998) including 2008 and 2013 catalogue code updates for communities that could not be described by the first approximation codes. The ELC information gathered included vegetation community type, species associations, and condition/level of disturbance. During field investigations for the GO Stations, ELC information was verified and further refined for properties that could be observed with existing PTEs. Vegetation communities that have not been classified during field investigations will be classified during subsequent field investigations once PTEs are obtained and during the appropriate season, to confirm and augment the findings provided within the BRCE Project EPR (Metrolinx, 2017b).

3.3.2 Vegetation Communities

Vegetation communities in Ontario have been classified in a hierarchical framework. Ecoregions are a relatively high level (coarse resolution) of the classification system. The Project spans the boundary between Ecoregions 6E and 7E. The City of Toronto and the southern half of the City of Vaughan fall within Ecoregion 7E, known as the Lake Erie-Ontario (Carolinian Forest) Site Region, while the remainder of the corridor falls within Ecoregion 6E, known as the Lake Simcoe-Rideau Site Region. Most lands within the existing Barrie rail corridor limits were characterized in the BRCE Project EPR (Metrolinx, 2017b) as meadow, hedgerows, and shrub/tree thicket with little to no mature tree cover. Lands within the study areas of each GO Station vary greatly. Non-native species in the Spadina-Front, Bloor-Lansdowne and Kirby study areas are indicative of the long-standing disturbance.

Spadina-Front GO Station

The Spadina-Front study area consists predominantly of rail corridor lands and urban land uses characterized by an abundance of impervious surfaces. A strip of naturalized vegetation (too small to satisfy ELC vegetation mapping requirements) located along the northern edge of the ROW consists of thickets of mostly non-native Trees and shrubs. Vegetation communities in the Spadina-Front study area are: one unit of Mineral Cultural Meadow (CUM1).

Bloor-Lansdowne GO Station

The Bloor-Lansdowne study area consists predominantly of urbanized rail corridor lands, dominated by cultural meadow and cultural thicket type vegetation. Vegetation communities in the Bloor-Lansdowne study area are: one unit of Dry-Fresh Exotic Deciduous Forest (FODM4-12), one unit of Mineral Cultural Woodland (CUW1), three units of Dry-Moist Old Field Meadow (CUM1-1), four units of Mineral Cultural Thicket (CUT1), six units of Cultural Green Lands (CGL) and one unit of Business Sector (CVC_1).

Kirby GO Station

The Kirby study area consists predominantly of agricultural lands, in addition to cultural meadow, cultural woodland, meadow marsh, and deciduous forest. Vegetation communities in the Kirby study area are: two units of Deciduous Forest (FOD), one unit of CUW1, six units of CUM1-1, three units of Meadow Marsh (MAM), two units of CGL and one unit of Intensive Agriculture (IAG).

Mulock GO Station

The Mulock study area consists predominantly of urbanized rail corridor lands. Throughout the Mulock study area, there are large pockets of cultural meadows, meadow marshes, and shallow marshes. There is a cultural plantation present, as well as a Unit[5] of open aquatic river that meanders throughout the Mulock study area. Vegetation communities in the Mulock study area are: three units of CUM1-1, one unit of Shallow Marsh (MAS), two units of MAM, one unit of Open Aquatic River (OAR), one unit of Cultural Plantation (CUP) and one unit of CGL.

[5] *For the purpose of the NER, 'Unit' refers to the ELC community.*

Innisfil GO Station

The Innisfil study area consists predominantly of agricultural lands (Photograph 3-4). Field investigations of the Innisfil study area conducted from the Barrie rail corridor ROW indicated that the former cultural thicket/meadow and woodland on the east side of the corridor are no longer present within the Innisfil study area. Furthermore, the parcel on the east side of the Barrie rail corridor on the north side of 6th Line is currently being cleared for the future Sleeping Lion residential development. As such, the lands on the eastern portion of the Innisfil study area are currently transitioning from a rural to suburban land use. There are four units of Intensive Agriculture (IAG) and one unit of Non-intensive Agriculture (NAG) in the Innisfil study area.

Photograph 3-4: Intensive Agricultural Lands Within the Innisfil Study Area

3.4 Tree Inventory

3.4.1 Methodology

The TIP for each GO Station was prepared based on existing information collected during the field visits completed on September 11, 12,13, and 15 and October 10, 13, 19 and 26, 2017. As Permission to Enter (PTE) requests for the properties outside of the Barrie rail corridor were not granted at the time of the field visits, the land survey was limited to the rail corridor ROW. Properties where PTEs was not granted will be assessed at a later date once Metrolinx has secured the required access permissions and during the next appropriate field season (i.e., during leaf-on), prior to Project construction. Ground data from an Ontario Land Survey (OLS) has not been collected to date, and will be collected during later design phases.

It has been conservatively assumed that all woody vegetation within each GO Station footprint will be removed, and those outside of the GO Station footprints, but within the GO Station study areas (i.e., within the six metre buffer, 12 metre buffer (Ravine Natural Feature Protection (RNFP) only) and ten metre buffer (Mulock GO Station only)) will be assessed on a case by case basis for impacts dependent on their dripline and the Tree Protection Zone (TPZ) identified. Specifically, Butternut trees of all sizes (including seedlings) will be searched for at least 50 metres from the proposed site within the MNRF Midhurst District and 25 metres from the proposed sites within the MNRF Aurora District.

Federal, provincial and municipal planning policies and regulations related to tree inventories apply to the proposed Project and provide the policy context for each TIP. Additional discussions with affected municipalities will be discussed during future design phases to determine applicable permitting requirements. These policies and the natural heritage features that they protect were investigated further in the NER, which was prepared under a separate cover and is presented in Appendix B of Volume 2 through Volume 6 of this EPR Addendum. Federal and provincial policies applying to all GO Stations are:

- *The Migratory Birds Convention Act* (MBCA) (1994) – As no permit can be issued for the incidental take of migratory birds or their nest or eggs as a result of economic activities, there is a responsibility to adhere to these regulations and ensure compliance, particularly during tree and vegetation removal associated with site clearance. Thus, tree and shrub removals required for the GO Stations will occur during specific timing windows;
- Canadian Food Inspection Agency (CFIA) – The GO Station study areas are within an identified regulated area which prohibits the movement of regulated materials (including but not limited to Ash wood or bark, and Ash wood chips or bark chips) (CFIA, 2014). As such, a movement certificate is required, and a number of best management practices (BMPs) must be implemented; and
- *Endangered Species Act* (ESA) (2007) – O. Reg. 242/08 (as amended) applies to select species on the SAR in Ontario (SARO) List. This regulation identifies exemptions under the ESA and associated directives required. Habitat in southern Ontario is conducive for the growth and establishment of woody vegetative species (i.e., Endangered Butternut (*Juglans cinerea*). As part of the TIPs, an assessment of the GO Station study areas for woody vegetative SAR was completed. Any woody vegetative SAR observed within the GO Station study areas are subject to the ESA.

3.4.2 Spadina-Front GO Station

The Spadina-Front study area for this TIP includes the proposed Spadina-Front GO Station footprint, as well as a six metre buffer.

In addition to the MBCA, the CFIA and the ESA, the municipal planning policies and regulations below are related to tree inventories and apply to the Spadina-Front GO Station:

- Toronto and Region Conservation Authority (TRCA) – Based on review of the TRCA's Regulation Mapping Tool[6] (accessed October 2, 2017), the Spadina-Front study area is

[6] *The TRCA Interactive Mapping Tool may not identify all regulated areas. Confirmation prior to construction works should be made through consultation with the TRCA.*

not mapped within the Authority's regulated area. As such, no permit under O. Reg. 166/06 will be required;

- City Street Tree By-Law – There are several City street trees located within the Spadina-Front study area which would be subject to the City Street Tree By-law. Those trees have been tagged with a pre-numbered aluminum tag;
- Private Tree By-law – There are several privately-owned trees located within the Spadina-Front study area, which would be subject to the Private Tree By-law. Those trees have not been tagged with a pre-numbered aluminum tag;
- Parks By-law – Based on review of the City of Toronto Interactive Map (version 2), no portion of the Spadina-Front study area is within or adjacent to any City Parkland area; and
- Ravine Natural Feature Protection (RNFP) By-law – Based on a review of the City of Toronto Interactive Map (version 2), no portion of the Spadina-Front study area is within the RNFP area.

Vegetation observed throughout the Spadina-Front study area consists of a high percentage of non-native species that have either been planted or occurred naturally that range in size from less than (<) ten cm Diameter at Breast Height (DBH) to approximately 30 cm DBH.

Thirty-two trees larger than ten cm DBH were identified within the Spadina-Front study area; one of these was in the Barrie rail corridor. An additional 436 trees less than ten cm DBH were assessed within the Barrie rail corridor.

The majority of vegetation assessed in the rail corridor is located in a narrow strip along the northern edge of the corridor. Tree species in the rail corridor include (in order of abundance): Tree-of-Heaven (*Ailanthus altissima*), Slippery Elm (*Ulmus rubra*), Siberian Elm (*Ulmus pumila*), European Ash (*Fraxinus excelsior*), Manitoba Maple (*Acer negundo*), Eastern Cottonwood (*Populus deltoides*), Dog Rose (*Rosa canina*), Apple (*Malus* sp.), Black Walnut (*Juglans nigra*), English Oak (*Quercus robur*), European Euonymus (*Euonymus europaeus*), Tartarian Honeysuckle (*Lonicera tatarica*), Norway Maple (*Acer platanoides*), Sweet Cherry (*Prunus avium*), Cherry (*Prunus* sp.), Red-osier Dogwood (*Cornus sericea*) and Russian Olive (*Elaeagnus angustifolia*).

Along Front Street West, within 15 metres of the northern edge of the rail corridor, Trees greater than ten cm DBH consist of planted White Elm (*Ulmus americana*), European Ash, Black Locust (*Robinia pseudoacacia*), Freeman Maple (*Acer* x *freemanii*) and Honey-locust (*Gleditsia triacanthos*). To the south of the rail corridor, Trees greater than ten cm DBH consist of planted Northern Hackberry (*Celtis occidentalis*), Silver Fir (*Abies concolor*), and Freeman Maple. Additionally, two Siberian Elms greater than ten cm DBH are located within six metres of the southern edge of the rail corridor but are not believed to have been planted.

Many of the trees situated within the Spadina-Front study area were found to be in fair condition. However, some trees showed signs and symptoms of abiotic and biotic defects leading to decline. No woody vegetative SAR (i.e., Butternut) were observed during the field visit.

3.4.3 Bloor-Lansdowne GO Station

The Bloor-Lansdowne study area for this TIP includes the Bloor-Lansdowne GO Station footprint, as well as a six metre buffer. For RNFP areas, the Bloor-Lansdowne study area is defined as the Bloor-Lansdowne GO Station footprint plus a 12 metre buffer in accordance with the applicable City of Toronto Tree Protection By-law(s). Where applicable, the descriptions in the Bloor-Lansdowne GO Station TIP are divided by “south study area” and “north study area”.

In addition to the MBCA, the CFIA and the ESA, the municipal planning policies and regulations below are related to tree inventories and apply to the Bloor-Lansdowne GO Station:

- Toronto and Region Conservation Authority (TRCA) – Based on a review of the TRCA’s Regulation Mapping Tool[7] (accessed October 2, 2017), the overall Bloor-Lansdowne study area is not mapped within the Authority’s regulated area. As such, no permit under O. Reg. 166/06 will be required;
- City Street Tree By-Law – There are several City street rees located within the overall Bloor-Lansdowne study area which would be subject to the City Street Tree By-law (i.e., along Dora Avenue). Those trees have been tagged with a pre-numbered aluminum tag;
- Private Tree By-law – There are several privately-owned trees located within the overall Bloor-Lansdowne study area, which would be subject to the Private Tree By-law (i.e., 31 Wade Avenue);
- Parks By-law - The north section of the proposed Bloor-Lansdowne GO Station will have an impact on City Park rees within Earlscourt Park. The majority of these rees are also part of the RNFP area; and
- Ravine Natural Feature Protection By-law – Based on a review of the City of Toronto Interactive Map (version 2) the south study area is not within the RNFP area, however, an area of the north study area in Earlscourt Park along the west and south slopes has been identified as a RNFP area. This area has been planted with native species and left to naturalize. As the RNFP requires a 12 metre buffer, the Bloor-Lansdowne study area was expanded to 12 metres for those portions within the RNFP area only. All other areas associated with the north area followed the Private and City Street Tree By-laws and incorporated a six metre buffer.

Woody vegetation observed throughout the overall Bloor-Lansdowne study area ranges from immature to mature and is comprised predominantly of non-native species. Woody vegetation for single stemmed trees ranged in size from less than one cm DBH to 110 cm DBH. Many of the trees and shrubs less than ten cm DBH were new saplings at the time of the site visit, which, depending on the timeframe for the proposed works, may increase to a size greater than ten cm DBH. Based on the field investigations, a total of 353 trees greater than ten cm DBH and 3,296 trees and shrubs less than ten cm DBH were assessed for the proposed Bloor-Lansdowne GO Station. An additional nine trees outside of the Barrie rail corridor fence were identified, as well as 56 trees and shrubs less than ten cm DBH and not part of a grouping.

[7] *The TRCA Interactive Mapping Tool may not identify all regulated areas. Confirmation prior to construction works should be made through consultation with the TRCA.*

Tree species identified for the Bloor-Lansdowne GO Station that were greater than 10 cm DBH include: American Elm (*Ulmus americana*), American Mountain Ash (*Sorbus americana*), Austrian Pine (*Pinus sylvestris*), American Basswood (*Tilia americana*), Black Ash (*Fraxinus nigra*), Black Cherry (*Prunus serotina*), Black Locust, Black Walnut, Bur Oak (*Quercus macrocarpa*), Canada Plum (*Prunus nigra*), Common Apple (*Malnus pumila*), Northern Catalpa (*Catalpa speciosa*), Eastern Cottonwood, Freeman Maple, Honey Locust, Kentucky Coffee Tree (*Gymnocladus dioicus*), Largetooth Aspen (*Populus grandidentata*), Littleleaf Linden (*Tilia cordata*), Manitoba Maple, Norway Maple, Paper Birch (*Betula papyrifera*), Red Oak (*Quercus rubra*), Siberian Elm, Sugar Maple (*Acer saccharum*), Sycamore (*Platanus occidentalis*), Tree of Heaven, White Ash (*Fraxinus americana*), White Mulberry (*Morus alba*), White Pine (*Pinus strobus*) and White Poplar (*Populus alba*).

Those trees and shrubs that were less than ten cm and/or identified as shrubs consisted of similar species as above, as well as Bitternut Hickory (*Carya cordiformis*), Pin Cherry (*Prunus pensylvanica*), Alternate leaved Dogwood (*Cornus alternifolia*), Chokecherry (*Prunus viginiana*), Staghorn Sumac (*Rhus typhina*), Common Buckthorn (*Rhamnus carthartica*), Downy Serviceberry (*Amelanchier arborea*), Grey Dogwood (*Cornus racemosa*), Highbush Cranberry (*Viburnum tilobum*), Rose spp. *(Rose spp*.).

Many of the trees and shrubs situated within the Bloor-Lansdowne study area were found to be in fair condition, however some trees showed signs and symptoms of abiotic and biotic defects leading to decline. No woody vegetative SAR (i.e., Butternut) were observed within the Barrie rail corridor during the field visit.

3.4.4 Kirby GO Station

The Kirby study area includes the proposed Kirby GO Station footprint, as well as a six-metre buffer surrounding the GO Station footprint.

In addition to the MBCA, the CFIA and the ESA, the municipal planning policies and regulations below are related to tree inventories and apply to the Kirby GO Station. These policies and the natural heritage features that they protect were investigated further in the NER, which was prepared under a separate cover and is presented in Volume 4 – Appendix B of the EPR Addendum.

- Toronto and Region Conservation Authority (TRCA) – Based on review of the TRCA's Regulation Mapping Tool[8] (accessed October 2, 2017), the Kirby study area is mapped within the Authority's regulated area. Despite the fact that the woodlot within the southern portion of the study area is not within TRCA's regulated area, the TRCA has indicated they will provide advice to the City of Vaughan and Metrolinx regarding upland natural heritage matters.
- Public Property Tree Protection By-law – Given the location of the proposed Kirby GO Station, the Public Property Tree Protection By-law would be applicable to the Kirby GO Station. Based on an overview of the Kirby study area there were no public Trees identified.

[8] The TRCA Interactive Mapping Tool may not identify all regulated areas. Confirmation prior to construction works should be made through consultation with the TRCA.

- City of Vaughan Tree Protection Protocol (2018) – Referred to for guidance on the City of Vaughan's TPZ requirements.
- Private Property Tree Protection By-law – Given the location of the proposed Kirby GO Station, the Private Property Tree Protection By-law would be applicable to the Kirby GO Station. Based on an overview of the Kirby study area there were several trees located on private property.
- Regional Municipality of York Forest Conservation By-law – A large woodland is located on the west side of the existing Barrie rail corridor, south of Kirby Road. A portion of the Kirby GO Station footprint encroaches within the eastern edge of the woodland. This woodland is considered a core feature in the City of Vaughan Official Plan (VOP 2010), as well as a natural heritage feature in the City's draft Block 27 Secondary Plan. Consultation with the City of Vaughan (Rendon, 2017) identified that the woodland must first be assessed from a Natural Heritage perspective to determine existing features and identify how those features would be impacted (i.e., wildlife habitat). The details of that assessment are documented in the NER (Volume 4, Appendix B of the EPR Addendum). Based upon the consultation with the City of Vaughan, the planning department would require a density assessment of the woodland rather than individual tree inventory. As no PTEs were available at the time the field investigation was completed, further assessment of the Kirby study area for the density assessment will be completed once PTEs have been obtained. This assessment will be completed during the appropriate field season (i.e., during leaf-on) prior to Kirby GO Station construction.
- City of Vaughan Official Plan – Section 3.3.3 of the VOP 2010 outlines policies pertaining to Woodlands. This is applicable to the Kirby GO Station assessment as outlined above for the Regional Municipality of York Forest Conservation By-Law (City of Vaughan, 2017b).

Woody vegetation observed within the Kirby GO Station footprint ranges from immature to mature, and is characterized by native and non-native species. Woody vegetation inventoried ranged in size from less than one centimetre DBH to 33 cm DBH. Many of the trees and shrubs less than ten cm DBH were new saplings, which, depending on the timeframe for the proposed works, may increase to a size greater than ten cm DBH. Based on the field visit, a total of 12-trees greater than ten cm DBH were assessed within the Barrie rail corridor. One tree greater than ten cm DBH situated on private property within the Kirby GO Station footprint (O24) was also documented. A total of 294 trees and shrubs less than ten cm DBH were assessed within the Barrie rail corridor, and 132 trees and shrubs less than ten cm DBH situated on private property within the Project footprint were also assessed.

Tree species identified within the Barrie rail corridor that were greater than ten cm DBH include: Manitoba Maple, Common Apple, Black Cherry, Trembling Aspen (Populous tremuloides), Eastern Cottonwood, White Pine, Scots Pine (*Pinus sylvestris*) and Black Ash. Those Trees that were less than ten cm and/or identified as shrubs consisted of similar species as above, as well as Chokecherry, Red Osier Dogwood (*Cornus sericea)*, Staghorn Sumac, Common Buckthorn, Pussy Willow (*Salix discolor*), Downy Serviceberry, and Downy Hawthorn (*Crataegus mollis*.).

Due to the active farmland and rural use along the east and northwestern side of the Barrie rail corridor (south of Kirby Road), trees and shrubs were located sporadically, and observations and assessments could not be made from within the Barrie rail corridor. Many of the trees within the Barrie rail corridor were found to be in good condition, however some trees showed signs and symptoms of abiotic and biotic defects leading to decline.

It is noted that the Ash trees observed within the Barrie rail corridor, based on current field visit observations, did not display signs of EAB infestation. Once additional PTEs are obtained, those private properties not assessed will be screened for evidence of EAB infestation. No woody vegetative SAR (i.e., Butternut) were observed within the Barrie rail corridor during the field visit.

3.4.5 Mulock GO Station

The Mulock GO Station TIP study area includes the proposed Mulock GO Station footprint, as well as a ten metre buffer surrounding the GO Station footprint.

In addition to the MBCA, the CFIA and the ESA, the municipal planning policies and regulations below are related to tree inventories and apply to the Mulock GO Station:

- Lake Simcoe Region Conservation Authority (LSRCA) – Based on a review of the LSRCA's Regulation Mapping Tool[9] (accessed October 2, 2017), the Mulock study area is partially mapped within the Authority's regulated area. As such, a permit under O. Reg. 179/06 will be required. Additional discussions with LSRCA in relation to the Mulock GO Station will be required;
- Town of Newmarket Tree Preservation, Protection, Replacement and Enhancement Policy – Given the location of the proposed Mulock GO Station, the Town of Newmarket Tree Preservation, Protection, Replacement and Enhancement Policy would be applicable to the Mulock GO Station. Based on an overview of the Mulock study area there were no street trees identified. Additional discussions with the Town of Newmarket in relation to the proposed Mulock GO Station will be required;
- York Region Street Tree and Forest Preservation Guideline – Given the location of the proposed Mulock GO Station, the York Region Street Tree and Forest Preservation Guideline would be applicable to the Mulock GO Station. Based on an overview of the Mulock study area, there are many street trees within the Regional ROW. Additional discussions with York Region and the Town of Newmarket in relation to the proposed Mulock GO Station will be required; and
- York Region Forest Conservation By-law – Woodlands associated with the East Holland River are located on the west side of the Barrie rail corridor. Given the characteristics of the woodlands, they were first assessed from a Natural Heritage perspective to determine existing features and identify how those features might be impacted (i.e., wildlife habitat) by the Mulock GO Station.

Woody vegetation observed throughout the Mulock study area ranges from immature to mature and is comprised predominantly of non-native species. Woody vegetation for single stemmed

[9] *The LSRCA Interactive Mapping Tool may not identify all regulated areas. Confirmation prior to construction works should be made through consultation with the LSRCA.*

trees ranged in size from less than one cm DBH to 48.5 cm DBH. Many of the trees and shrubs less than ten cm DBH were new saplings, which depending on the timeframe for the proposed works, may increase to a size greater than ten cm DBH. Based on the field investigations, a total of 153 trees and shrubs were assessed. No Regional ROW trees are located within the Mulock GO Station footprint or within ten metres. An additional 11 trees situated on private property and/or within the Barrie rail corridor were identified. The majority of trees and shrubs (146) identified for removal are those within the Barrie rail corridor that have DBH measurements less than ten cm.

Tree species identified for the Mulock GO Station that were greater than ten cm DBH include, Austrian Pine, American Basswood, Balsam Poplar (*Populus balsamifera*), Balsam Fir (*Abies balsamea*), Black Locust, Bur Oak, Eastern White Cedar (*Thuja occidentalis*), Little Leaf Linden (*tilia cordata*), Norway Spruce (*Picea abies*), Manitoba Maple, Norway Maple, Red Pine (*Pinus resinosa*), Sandbar Willow (*Salix interior*), Siberian Elm, Slippery Elm, White Willow (Salix alba), English Oak.

Those Trees and shrubs that were less than ten cm and/or identified as shrubs consisted of similar species as above, as well as Chokecherry, Common Buckthorn, Common Elderberry (*Sambucus nigra*), Honeysuckle (*Lonicera spp.*), Red Osier Dogwood, Downy Hawthorn, Downy Serviceberry.

Many of the trees and shrubs situated within the Mulock study area were found to be in fair condition; however, some trees showed signs and symptoms of abiotic and biotic defects leading to decline. It is noted that no Ash trees were observed during the field visits completed on September 12, 13 and October 13, 2017. No woody vegetative SAR (i.e., Butternut) were observed during the field visits.

3.4.6 Innisfil GO Station

The Innisfil GO Station TIP study area for includes the proposed Innisfil GO Station footprint, as well as a six-metre buffer surrounding the GO Station footprint.

In addition to the MBCA, the CFIA and the ESA, the municipal planning policies and regulations below are related to tree inventories and apply to the Innisfil GO Station.

- Lake Simcoe Region Conservation Authority (LSRCA) – Based on a review of the LSRCA's Regulation Mapping Tool[10] (accessed October 2, 2017), the Innisfil study area is not mapped within the Authority's regulated area. As such, no permit under O. Reg. 179/06 will be required.

Woody vegetation observed within the Innisfil GO Station footprint ranges from immature to mature, and is characterized by native and non-native species. Woody vegetation for single stemmed trees ranged in size from less than one centimetre DBH to 37 cm DBH. Those trees with multiple stems when combined had DBH as high as 78 cm. Many of the trees and shrubs less than ten cm DBH were new saplings, which, depending on the timeframe for the proposed works, may increase to a size greater than ten cm DBH. Based on this field visit, a total of 11 trees greater than ten cm DBH were assessed within the Barrie rail corridor. Two additional

[10] *The LSRCA Interactive Mapping Tool may not identify all regulated areas. Confirmation prior to construction works should be made through consultation with the LSRCA.*

trees located outside of the Barrie rail corridor (on private property) were also assessed but were not tagged as they could not be accessed. An additional 819 trees and shrubs less than ten cm DBH were assessed within the Barrie rail corridor.

Tree species identified within the Barrie rail corridor that were greater than ten cm DBH include Slippery Elm and Green Ash (*Fraxinus pennsylvanica*), followed by White Willow, Manitoba Maple, Eastern White Cedar, Norway Maple, Common Apple, Black Cherry and American Basswood. Those Trees that were less than ten cm DBH and/or identified as shrubs consisted of similar species as above, as well as Chokecherry, Red Osier Dogwood, Staghorn Sumac, Common Buckthorn, Pussy Willow, Downy Serviceberry, American Mountain Ash, Common Elderberry and Hawthorn (*Crataegus spp.*).

Due to the active farmland and rural use in the Innisfil study area, as well as the land clearing activities for future land development, trees outside of the Barrie rail corridor appeared to be limited based on aerial imagery interpretation.

Many of the trees and shrubs situated within the Innisfil study area were found to be in fair condition; however, some trees showed signs and symptoms of abiotic and biotic defects leading to decline. It is noted that the Ash trees observed within the Barrie rail corridor, based on current field visit observations, did not display signs of EAB infestation. No woody vegetative SAR (i.e., Butternut) were observed during the field visit.

3.5 Significant Natural Features

3.5.1 Methodology

Information was collected and reviewed from several sources, including but not limited to: Natural Heritage Information Centre (NHIC) and Land Information Ontario (LIO) databases; relevant OPs; regulation mapping and resources of the conservation authority having jurisdiction; as well as correspondence with the MNRF.

Prior to site investigations, a desktop screening was completed to identify potential SAR habitat and other potential wildlife habitat associated with approximated vegetation communities and watercourses. During the site investigations, all direct wildlife observations and wildlife signs (including browse, tracks/trails, animal scat, bird nesting activity, tree cavities, burrows, excavated holes and vocalizations) were recorded. Incidental wildlife species observations were noted.

The Significant Wildlife Habitat (SWH) is evaluated based on-site-specific attributes within the GO Station study areas compared to the SWH Ecoregion Criteria Schedules for Ecoregion 7E (Spadina-Front and Bloor-Lansdowne GO Stations, Ecoregion 6E (Kirby, Mulock, and Innisfil GO Stations) (MNRF, 2015a), (MNRF, 2015b). The SWH Assessment Tables are provided in Appendix B of Volume 2 through Volume 6 of this EPR Addendum.

The SAR Screening Tables are provided in Appendix B of Volume 2 through Volume 6 of this EPR Addendum. These tables indicate the potential of a given SAR species to occur within the GO Station study areas based on habitat and known species distribution and the corresponding potential and severity of impacts to the species. Species assessed in this list are compiled from Ontario's Reptile and Amphibian Atlas, the Atlas of the Breeding Birds of Ontario (OBBA),

correspondence with the MNRF and 4T field observations (Ontario Nature, 2017) (Cadman *et al.,* 2007).

3.5.2 Wetlands and Provincially Significant Wetlands

Designated natural heritage features indicated through background review are shown in Figure 3-1, Figure 3-2, Figure 3-3 and Figure 3-4. There is no figure for the Spadina-Front GO Station as its study area has no designated natural features. The presence of wetlands was evaluated in each GO Station study area.

- Spadina-Front GO Station – There are no wetlands within the Spadina-Front study area;
- Bloor-Lansdowne GO Station – There are no wetlands within the Bloor-Lansdowne study area;
- Kirby GO Station - There are three Units of the Don River West Branch Headwater Wetland Complex located with the Kirby study area (MNRF, 2017);
- Mulock GO Station – There are multiple unevaluated wetlands within the Mulock study area. The Mulock study area falls within the floodplain for the East Holland River, and there are multiple unevaluated wetland communities identified within the Mulock study area. The East Holland River traverses the Mulock study area along with a number of unevaluated wetlands (Photograph 3-5). There are no PSWs within the Mulock study area; and
- Innisfil GO Station – There are no wetlands within the Innisfil study area (LSRCA, 2012). There are three wetlands mapped in proximity to the Innisfil study area: a PSW (Little Cedar Point Wetland) approximately 600 metres southeast of the Innisfil study area; and two non-evaluated wetlands approximately 400 metres to the northwest and 300 metres to the east of the Innisfil study area, respectively.

Photograph 3-5: Unevaluated Wetland along the East Holland River within the Mulock Study Area

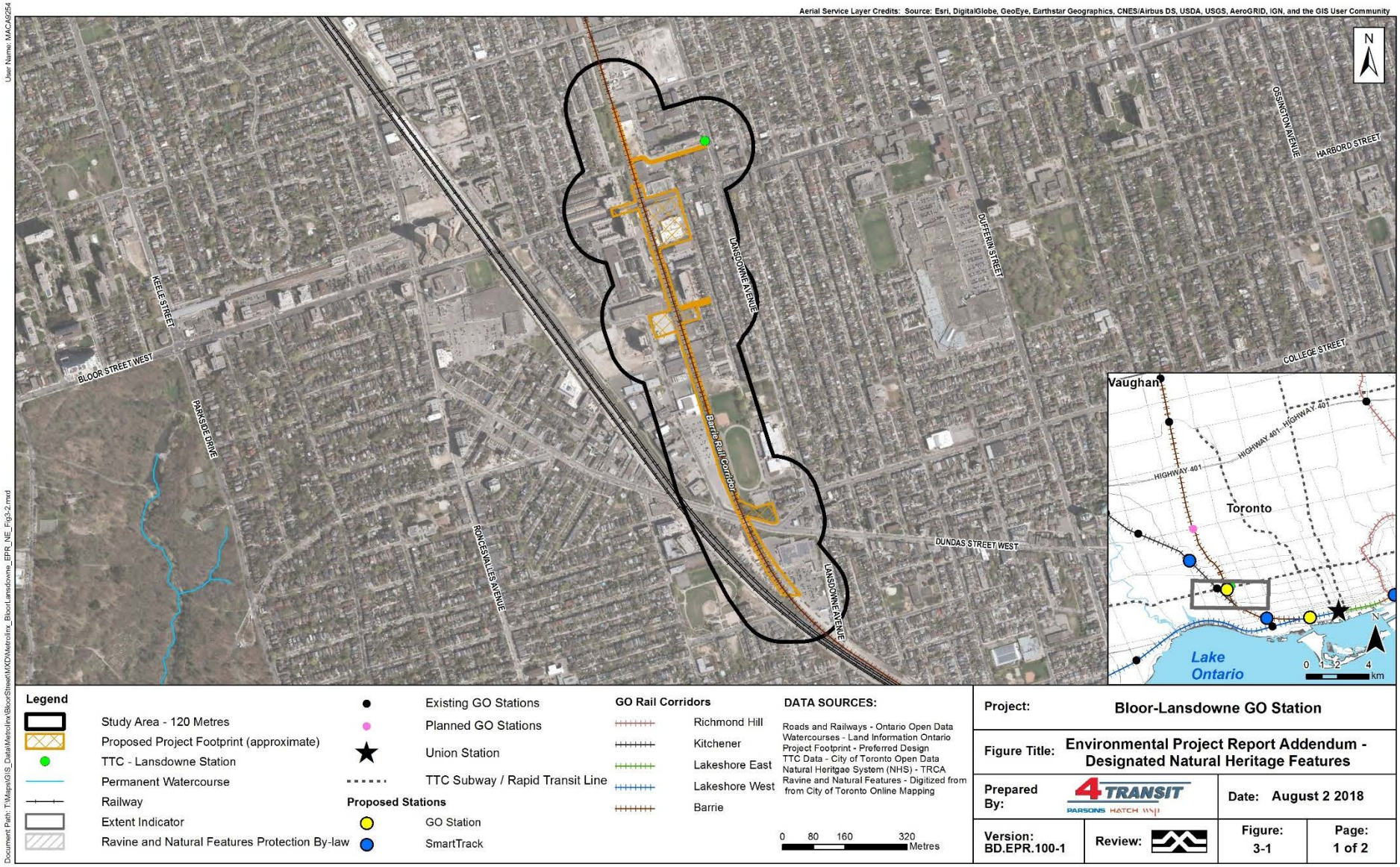


Figure 3-1: Bloor-Lansdowne GO Station – Designated Natural Heritage Features

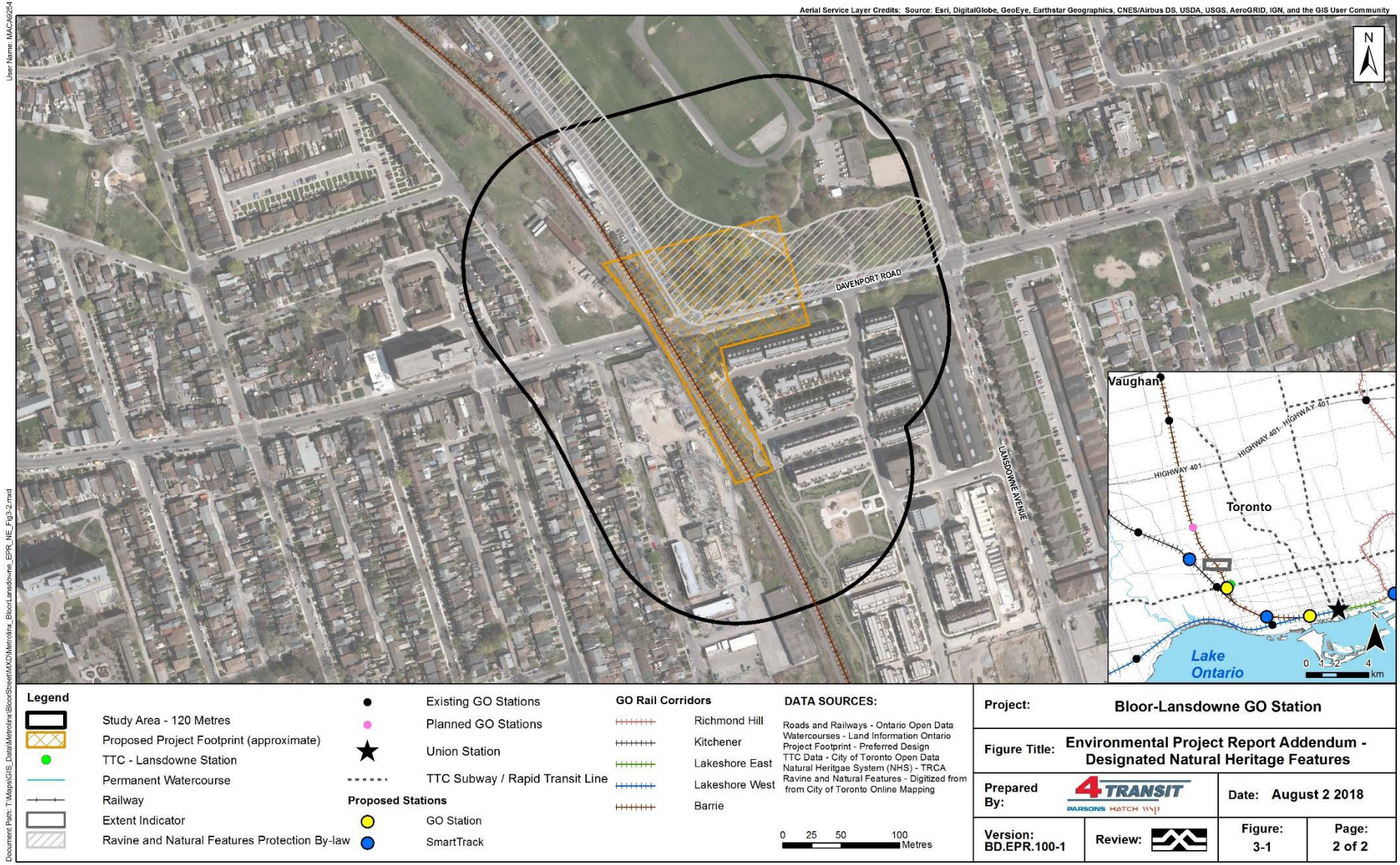


Figure 3-1: Bloor-Lansdowne GO Station – Designated Natural Heritage Features

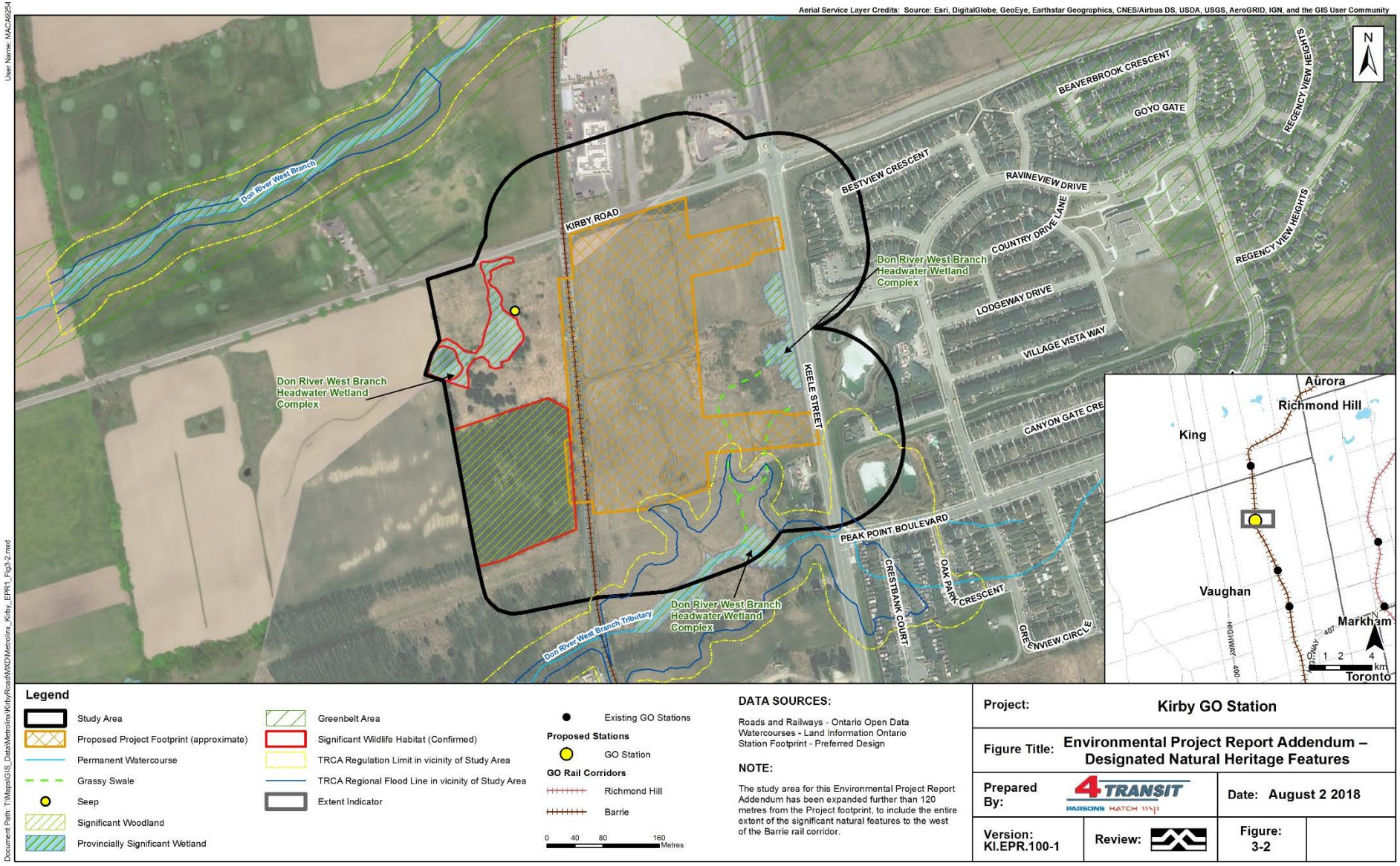


Figure 3-2: Kirby GO Station – Designated Natural Heritage Features

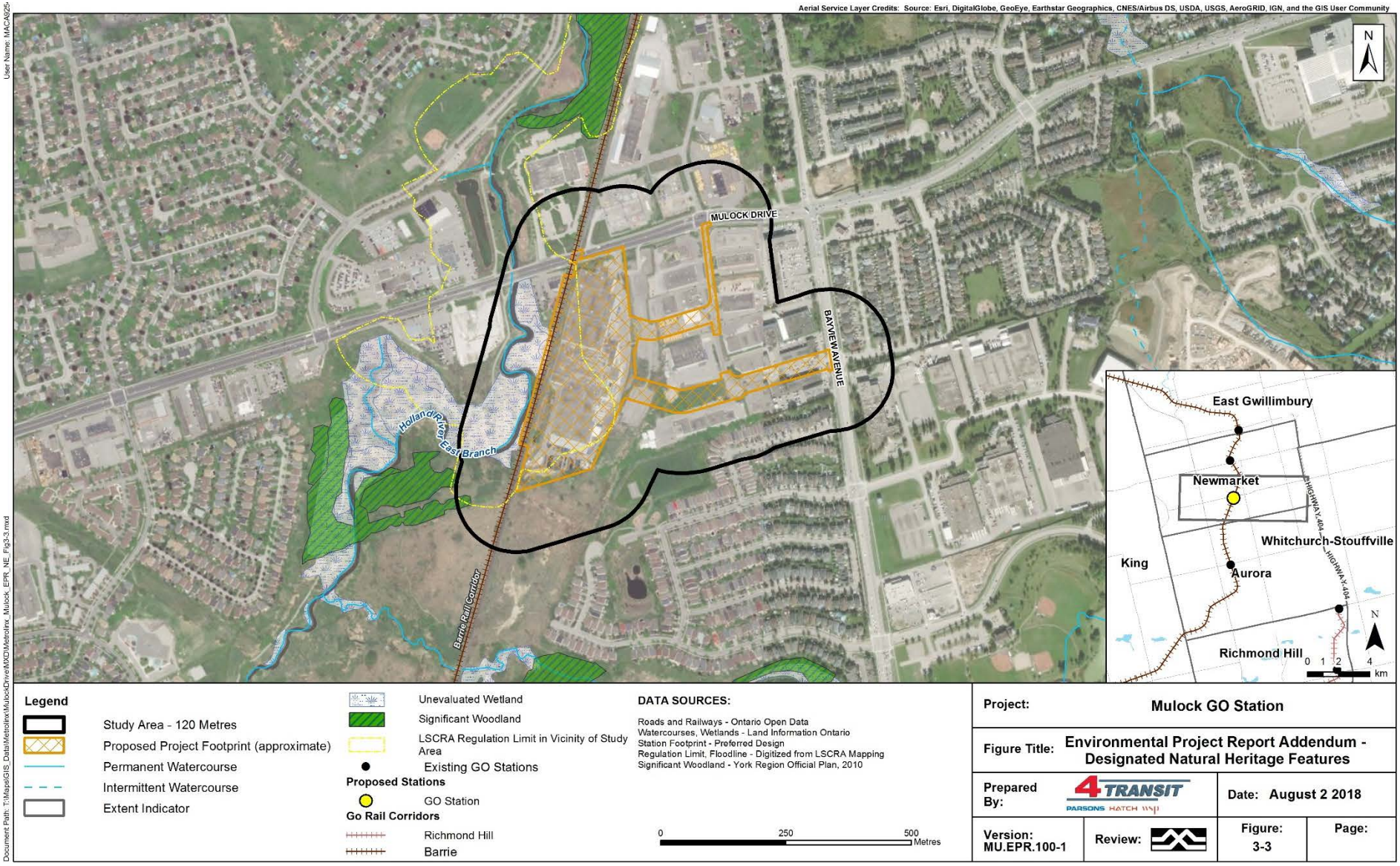


Figure 3-3: Mulock GO Station – Designated Natural Heritage Features

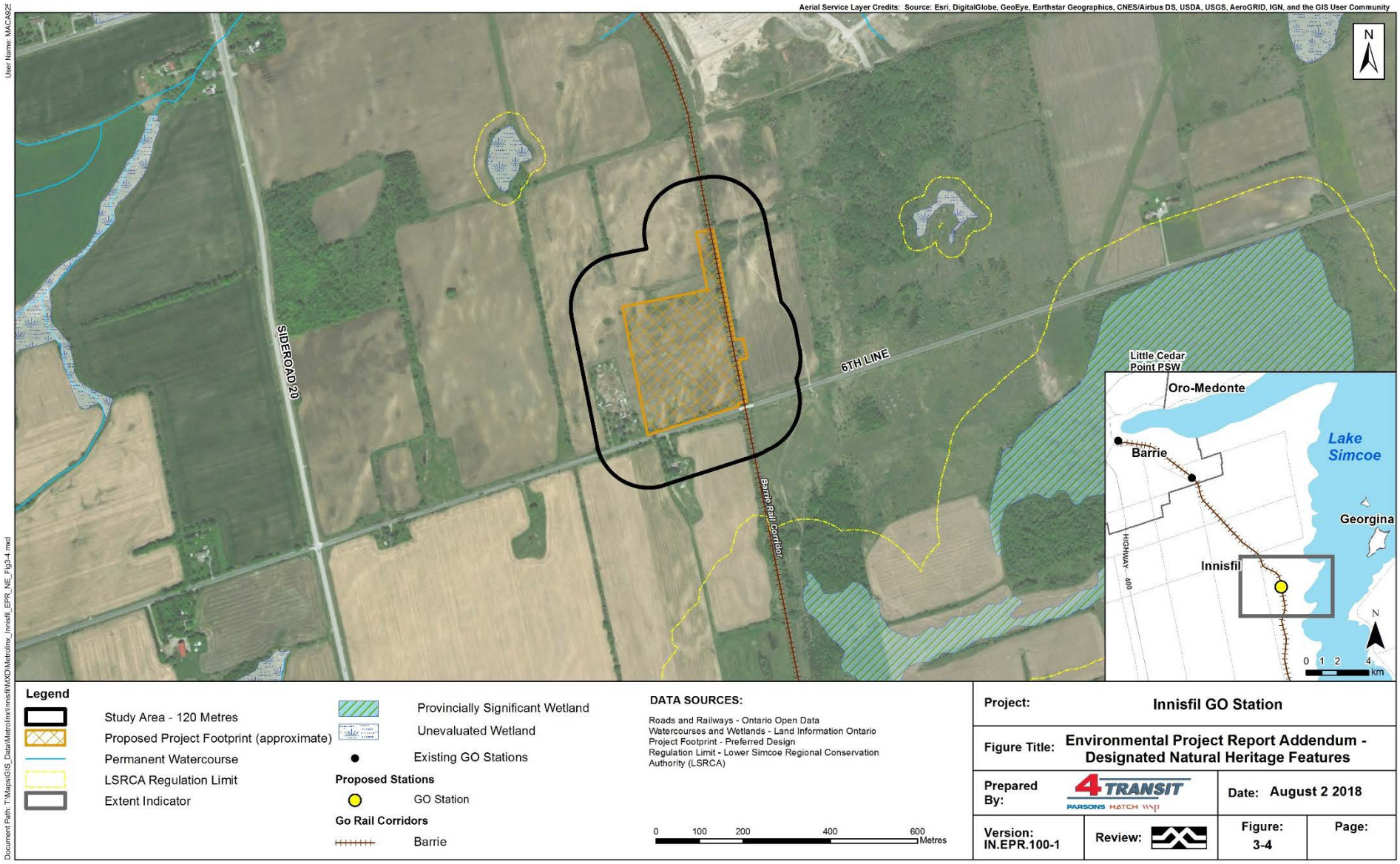


Figure 3-4: Innisfil GO Station – Designated Natural Heritage Features

3.5.3 *Significant Woodlands*

The presence of Significant Woodlands was evaluated in each GO Station study area. There are no Significant Woodlands in the Spadina-Front, Bloor-Lansdowne, Mulock or Innisfil study areas. There are two units of FOD identified as Significant Woodlands within the Kirby study area.

3.5.4 *Significant Valleylands*

The presence of Significant Valleylands was evaluated in each GO Station study area. There are no Significant Valleylands in the Spadina-Front, Bloor-Landowne, Kirby, or Innisfil study areas. A Significant Valleyland was identified by the BRCE EPR to be within the Mulock study area (Metrolinx, 2017b).

3.5.5 *Areas of Natural and Scientific Interest*

The presence of Areas of Natural and Scientific Interest (ANSI) was evaluated in each GO Station study area. No ANSIs are located within the GO Station study areas.

3.5.6 *Significant Wildlife Habitat*

3.5.6.1 *Spadina-Front GO Station*

No Candidate SWH or Confirmed SWH has been identified by MNRF or 4T within the Spadina-Front study area.

3.5.6.2 *Bloor-Lansdowne GO Station*

No Candidate SWH or Confirmed SWH has been identified by MNRF or 4T within the Bloor-Lansdowne study area.

3.5.6.3 *Kirby GO Station*

The following SWH has been confirmed in the study area:

- Specialized Habitat for Wildlife:
  - Amphibian Breeding Habitat (Woodlands); and
  - Amphibian Breeding Habitat (Wetlands).

At the time of field investigations, PTE requests were not granted for all lands within the Kirby study area; additional field investigations are required to confirm the presence or absence of the following wildlife habitat within the Kirby study area:

- Seasonal Concentration of Animals:
  - Raptor Wintering Area (Candidate);
  - Bat Maternity Colonies (Candidate); and
  - Reptile Hibernacula (Candidate).
- Rare Vegetation Communities:
  - Other Rare Vegetation Communities (Candidate).
- Specialized Habitat for Wildlife:
  - Seeps and Springs;

- Waterfowl Nesting Area (Candidate); and
- Turtle Nesting Area (Candidate).

- Habitat for Species of Conservation Concern (SCC):
  - Marsh Breeding Bird Habitat (Candidate);
  - Terrestrial Crayfish (Candidate); and
  - Special Concern and Rare Wildlife Species (Candidate).
- Animal Movement Corridors:
  - Amphibian Movement Corridors (Candidate).

3.5.6.4 Mulock GO Station

At the time of field investigations, PTEs were not granted for all lands within the Mulock study area; additional field investigations will be required to confirm the presence or absence of candidate SWH within the Mulock study area. The SWH has previously been identified within the BRCE EPR (Metrolinx, 2017b). Additional studies within the Mulock study area indicate the following wildlife habitat is potentially present within the Mulock study area:

- Seasonal Concentration Areas of Animals:
  - Waterfowl Stopover and Staging Areas (Aquatic) (Candidate);
  - Bat Maternity Colonies (Candidate);
  - Turtle Wintering Area (Candidate); and
  - Reptile Hibernacula (Candidate).
- Rare Vegetation Communities:
  - Other Rare Vegetation Communities (Candidate).
- Specialize Habitat for Wildlife:
  - Waterfowl Nesting Area (Candidate);
  - Turtle Nesting Area (Candidate);
  - Seeps and Springs (Candidate);
  - Amphibian Breeding (Woodland) (Candidate); and
  - Amphibian Breeding (Wetland) (Candidate).
- Habitat for Species of Conservation (Not including Endangered or Threatened Species):
  - Marsh Breeding Bird Habitat (Candidate);
  - Terrestrial Crayfish (Candidate); and
  - Special Concern and Rare Wildlife Species (Candidate).
- Animal Movement Corridors:

- Amphibian Movement Corridors (Candidate).

3.5.6.5 *Innisfil GO Station*

No Candidate SWH or Confirmed SWH have been identified by the MNRF or 4T within the Innisfil study area.

3.5.7 Special Concern and Rare Wildlife Species

Species at Risk (SAR) include species that are designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and/or listed under the *Species at Risk Act* (SARA, 2002) and species designated by the Committee on the Status of Species at Risk in Ontario (COSSARO) and/or listed under the ESA, including Extirpated, Endangered, Threatened, and Special Concern species. Only those listed as Endangered and Threatened are afforded species and habitat protection under Ontario's ESA.

3.5.7.1.1 Aquatic Species

No records of aquatic SAR have been documented within any of the GO Station study areas. Subsequent field investigations will be required to determine if any aquatic SAR are present.

3.5.7.1.2 Terrestrial Fauna

For all GO Stations, the SAR identified with some potential to occur, and their corresponding S-rank[11], ESA, COSEWIC and SARA status, are presented in Table 3-4 below. During subsequent 4T field investigations, potential SAR habitat will be assessed within all GO Station study areas.

Table 3-4: Species at Risk

Common Name	Accepted Name	S-Rank	ESA	COSEWIC	SARA	Schedule
Spadina-Front GO Station						
Barn Swallow	*Hirundo rustica*	S4B	Threatened	-	Threatened	-
Chimney Swift	*Chaetura pelagica*	S4B, S4N	Threatened	-	Threatened	-

[11] *S-rank refers to the NatureServe conservation status system ranking designated at a subnational level (S-rank) for a particular next-lower geographical unit within a nation, such as a province or territory. The numbers and letters indicate the following;*
***1** — **Critically imperiled** — (typically having 5 or fewer occurrences, or 1,000 or fewer individuals).*
***2** — **Imperiled** — (typically having 6 to 20 occurrences, or 1,001 to 3,000 individuals).*
***3** — **Vulnerable** — (rare; typically having 21 to 100 occurrences, or 3,001 to 10,000 individuals).*
***4** — **Apparently secure** — (uncommon but not rare, but with some cause for long-term concern; typically having 101 or more occurrences, or 10,001 or more individuals).*
***5** — **Secure** — (common, widespread, abundant, and lacking major threats or long-term concerns).*
***B** — **Breeding** — Conservation status refers to the breeding population of the species in the nation or province.*
***N** — **Nonbreeding** — Conservation status refers to the non-breeding population of the species in the nation or state/province.*
***R or ?** — Recorded within a nation or subnation, but local status not available or not yet determined. When combined with a global rank of G1 to G3, local status is 'Indeterminate,' but the entity is nevertheless presumed vulnerable, if still extant.*

Common Name	Accepted Name	S-Rank	ESA	COSEWIC	SARA	Schedule
Common Nighthawk	*Chordeiles minor*	S4B	Special Concern	-	Threatened	-
Peregrine Falcon	*Falco peregrinus anatum*	S3B	Special Concern	-	Special Concern	-
Bloor-Lansdowne GO Station						
Eastern Small-footed Myotis	*Myotis leibii*	S2S3	Endangered	Endangered	Endangered	1
Little Brown Myotis	*Myotis lucifugus*	S4	Endangered	Endangered	Endangered	1
Northern Myotis	*Myotis septentrionalis*	S3	Endangered	Endangered	Endangered	1
Tri-coloured Bat	*Perimyotis subflavus*	S3	Endangered	Endangered	Endangered	1
Bank Swallow	*Riparia riparia*	S4B	Threatened	Threatened	Threatened	1
Barn Swallow	*Hirundo rustica*	S4B	Threatened	Threatened	Threatened	1
Bobolink	*Dolichonyx oryzivorus*	S4B	Threatened	Threatened	Threatened	1
Chimney Swift	*Chaetura pelagica*	S4B, S4N	Threatened	Threatened	Threatened	1
Common Nighthawk	*Chordeiles minor*	S4B	Special Concern	Threatened	Threatened	1
Eastern Meadowlark	*Sturnella magna*	S4B	Threatened	Threatened	Threatened	1
Peregrine Falcon	*Falco peregrinus*	S3B	Special Concern	Special Concern	Special Concern	1
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S3B	Special Concern	Threatened	Threatened	1
Eastern Hog-nosed Snake	*Heterodon platirhinos*	S3	Threatened	Threatened	Threatened	1
Milksnake	*Lampropeltis triangulum*	S3	No Status	Special Concern	Special Concern	1

Common Name	Accepted Name	S-Rank	ESA	COSEWIC	SARA	Schedule
Kirby GO Station						
Eastern Small-footed Myotis	*Myotis leibii*	S2S3	Endangered	Endangered	Endangered	1
Little Brown Myotis	*Myotis lucifungus*	S4	Endangered	Endangered	Endangered	1
Northern Myotis	*Myotis septentrionalis*	S3	Endangered	Endangered	Endangered	1
Tri-coloured Bat	*Perimyotis subflavus*	S3	Endangered	Endangered	Endangered	1
Bank Swallow	*Riparia riparia*	S4B	Threatened	Threatened	Threatened	1
Barn Swallow	*Hirundo rustica*	S4B	Threatened	Threatened	Threatened	1
Bobolink	*Dolichonyx oryzivorus*	S4B	Threatened	Threatened	Threatened	1
Cerulean Warbler	*Setophaga cerulean*	S3B	Endangered	Threatened	Endangered	1
Chimney Swift	*Chaetura pelagica*	S4B, S4N	Threatened	Threatened	Threatened	1
Eastern Meadowlark	*Sturnella magna*	S4B	Threatened	Threatened	Threatened	1
Eastern Wood-Pewee	*Contopus virens*	S4B	Special Concern	Special Concern	Special Concern	1
Peregrine Falcon	*Falco peregrinus*	S3B	Special Concern	Special Concern	Special Concern	1
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S3B	Special Concern	Threatened	Threatened	1
Wood Thrush	*Hylocichla mustelina*	S4B	Special Concern	Threatened	Threatened	1
Eastern Ribbonsnake	*Thamnophis saurius*	S4	Special Concern	Special Concern	Special Concern	1
Jefferson Salamander	*Ambystoma jeffersoniamnum*	S2	Endangered	Endangered	Endangered	1
Snapping Turtle	*Chelydra serpentine*	S3	Special Concern	Special Concern	Special Concern	1

Common Name	Accepted Name	S-Rank	ESA	COSEWIC	SARA	Schedule
Monarch	*Danaus plexipplus*	S2N, S4B	Special Concern	Endangered	Special Concern	1
Mulock GO Station						
Eastern Small-footed Myotis	*Myotis leibii*	S2S3	Endangered	Endangered	Endangered	1
Little Brown Bat	*Myotis lucifungus*	S4	Endangered	Endangered	Endangered	1
Northern Myotis	*Myotis septentrionalis*	S3	Endangered	Endangered	Endangered	1
Tri-coloured Bat	*Perimyotis subflavus*	S3	Endangered	Endangered	Endangered	1
Bobolink	*Dolichonyx oryzivorus*	S4B	Threatened	Threatened	Threatened	1
Bank Swallow	*Riparia riparia*	S4B	Threatened	Threatened	Threatened	1
Barn Swallow	*Hirundo rustica*	S4B	Threatened	Threatened	Threatened	1
Eastern Meadowlark	*Sturnella magna*	S4B	Threatened	Threatened	Threatened	1
Eastern Wood-Peewee	*Contopus virens*	S4B	Special Concern	Special Concern	Special Concern	1
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S3B	Special Concern	Threatened	Threatened	1
Peregrine Falcon	*Falco peregrinus*	S3B	Special Concern	Special Concern	Special Concern	1
Wood Thrush	*Hylocichla mustelina*	S4B	Special Concern	Threatened	Threatened	1
Snapping Turtle	*Chelydra serpentina*	S3	Special Concern	Special Concern	Special Concern	1
Monarch	*Danaus plexippus*	S4B	Special Concern	Endangered	Special Concern	1
Innisfil GO Station						
Little Brown Bat	*Myotis lucifungus*	S4	Endangered	Endangered	Endangered	1
Northern Myotis	*Myotis septentrionalis*	S3	Endangered	Endangered	Endangered	1
Tri-coloured Bat	*Perimyotis subflavus*	S3	Endangered	Endangered	Endangered	1
Bank Swallow	*Riparia riparia*	S4B	Threatened	Threatened	Threatened	1
Barn Swallow	*Hirundo rustica*	S4B	Threatened	Threatened	Threatened	1

Common Name	Accepted Name	S-Rank	ESA	COSEWIC	SARA	Schedule
Eastern Meadowlark	*Sturnella magna*	S4B	Threatened	Threatened	Threatened	1
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S3B	Special Concern	Threatened	Threatened	1

3.5.7.1.3 Flora

The MNRF NHIC database has no records of SAR flora within any of the GO Station study areas and/or in the general vicinity of any GO Station study areas. Correspondence with the MNRF Aurora District stated Butternut (*Juglans cinerea*) has the potential to occur within the Mulock and Kirby study areas (M. Shapiera, personal communication, October 25, 2017). This species is protected by the ESA. Correspondence with the MNRF (Midhurst District) stated that Butternut (*Juglans cinerea*) (Endangered) should be searched for at least 50 metres from the Project footprint, while the MNRF Aurora District stated that the area within 25 metres of the Project footprint should be surveyed for Butternut. Observations of flora SAR will be recorded during the subsequent field investigations.

3.5.8 Habitat of Endangered and Threatened Species

A species is classified as Endangered under the ESA, 2007 if it lives in the wild in Ontario but is facing imminent extinction or extirpation. A species is classified as Threatened under the ESA if it is likely to become endangered if steps are not taken to address factors threatening to lead to its extinction or extirpation. Habitats of Endangered and Threatened species are protected under the ESA and various associated species-specific habitat regulations. In general, habitats protected include lands which are:

- Necessary for the maintenance, survival and/or recovery of naturally occurring or reintroduced populations; and
- Occupied or habitually occupied by the species during all or any part(s) of its life cycle.

Species listed as Endangered or Threatened under the ESA with potential to be present within the GO Station study areas were identified based on correspondence with the MNRF. These are shown in Section 3.5.7 of this EPR Addendum.

No SWH or candidate SWH was identified in the Spadina-Front, Bloor-Lansdowne or Innisfil study areas. Details related to SWH and candidate SWH for Kirby and Mulock study areas are summarized in Section 3.5.6.

At the time of field investigations, PTE requests were not granted for all lands within the Mulock study area; additional field investigations will be required to confirm the presence or absence of candidate SWH within the Mulock study area.

3.6 Archaeological Resources

3.6.1 Methodology

A Stage 1 Archaeological Assessment (AA) for each GO Station on the Barrie rail corridor was triggered under O. Reg. 231/08 of the EAA. This Project includes the requirement for a Stage 1 AA as one of the conditions for approval to ensure that the proponent (i.e., Metrolinx) meets

their legal obligations under the *Ontario Heritage Act* (OHA), 1990. The Stage 1 Archaeological Assessments (AAs) were carried out during the TPAP (provided in Appendix D of Volume 2 through Volume 6 of this EPR Addendum). Archaeological activities were carried out in accordance with the Standards and Guidelines for Consultant Archaeologists (S&G) developed by the Ministry of Tourism, Culture and Sport (MTCS) in 2011 (MTCS, 2011).

The Stage 1 AAs involved a review of documents including historic maps, aerial photographs and local histories. Property inspections were conducted on September 1, October 11, October 12 and October 25, 2017.

Archaeological recommendations were made based on background historical research, locations of known or registered archaeological sites, previous AAs and indicators of archaeological potential as outlined in the 2011 S&G.

3.6.2 Stage 1 Archaeological Assessment

First Nations peoples have a deep history of occupation in each study area since initial migrations following deglaciation. Early First Nations groups would have made use of resource areas and various well-drained terrain features located near river mouths or along the glacial and post-glacial shorelines, as well as the numerous native trails used for trade in the area. Each study area has been used as a rail corridor since the 1800s and historic maps depict the surrounding lands as farmland.

3.6.2.1 Spadina-Front GO Station

The Stage 1 AA identified the potential for the recovery of both pre-contact and post-contact period archaeological resources, based on the following summary:

- Six previous AAs have been conducted within the Spadina-Front study area:
  - ASI conducted a Stage 1 AA and subsequent Stage 2 AA for the lands situated on the northwest corner of Front Street West and Spadina Avenue. The Stage 1 AA determined that the majority of the land was previously disturbed and a small area requires Stage 2 AA testing. At the completion of the Stage 2 AA the area was deemed to not require further AA. The area is now considered free of all archaeological concern (Archaeological Services Incs (ASI), 2014a) (ASI, 2014b);
  - P392-0107-2014 conducted a Stage 1 AA of Block 22 on the south-east corner of Spadina Avenue and Blue Jays Way. The assessment recommended construction monitoring as there may be intact lakefill layers below the modern fill;
  - P125-0154-2014 was a Stage 1 AA conducted of the property located at 400 Front Street West completed by ASI in 2015. Sections of the property were identified to hold archaeological potential and were recommended to undergo Trenching for deeply buried concerns;
  - A Stage 1 AA was conducted within a portion of the study area (CIF P050-072). The assessment determined that the study area holds archaeological potential and trenches should be placed with in western portion of their study area; and
  - P049-137-2006/P049-137-2006-S4EE is a Stage 1 AA that was conducted by ASI in 2006. The report was not available for review and no recommendations are outlined on the data base.

- The Ontario Archaeologists Sites Database (OASD) indicated that there are 27 registered archaeological sites within a one km radius of the Spadina-Front study area. None are within 50 metres of the Spadina-Front study area;
- There are 41 listed and designated heritage properties within 50 metres of the Spadina-Front study area; and
- The Spadina-Front study area is located in close proximity to historical shorelines (50 metres of Lake Ontario) and historic transportation (Front Street, Bathurst Street, Spadina Avenue, Rail corridor).

Spadina-Front GO Station Stage 1 AA results are presented in Figure 3-5. Stage 2 AAs are to be completed prior to construction.

3.6.2.2 Bloor-Lansdowne GO Station

The Stage 1 AA identified the potential for the recovery of both pre-contact and post-contact period archaeological resources, based on the following summary:

- Two previous AAs have been conducted of the Barrie rail corridor within the Bloor-Lansdowne study area:
  - The Stage 1 AA for the BRCE Project (P057-0837-2016) identified a historic cemetery associated with St Helens Historic Church located just south of Dundas Street West which is partly within the current Bloor-Lansdowne study area (ASI, 2017). The Stage 1 AA determined the rail corridor passing through the Bloor-Lansdowne study area to be disturbed and free of archaeological concern; and
  - The Stage 1 AA of the DDRGS, which was completed by ASI in 2009, has been requested from the MTCS.
- The OASD indicated that there are eight registered archaeological sites within a one km radius of the Bloor-Lansdowne study area. None are within 50 metres of the Bloor-Lansdowne study area;
- There are three designated heritage properties partly located within the Bloor-Lansdowne study area; and
- The Bloor-Lansdowne study area is located in close proximity to historic transportation routes (Bloor Street West, Dundas Street West, and the Barrie rail corridor).

Bloor-Lansdowne GO Station Stage 1 AA results are presented in Figure 3-6. Stage 2 AAs are to be completed prior to construction.

3.6.2.3 Kirby GO Station

The Stage 1 AA identified the potential for the recovery of both pre-contact and post-contact period archaeological resources, based on the following summary:

- Eleven previous AAs have been conducted within lots associated with the Kirby study area;
- The OASD indicated that there are 45 registered archaeological sites within a one km radius of the Kirby study area. One is located within 50 metres of the Kirby study area; none are within the Kirby study area; and

- The Kirby study area is located in close proximity to primary water sources (Don River West Branch) and historic transportation routes (Kirby Road, Keele Street and the Barrie rail corridor).

Kirby GO Station Stage 1 AA results are presented in Figure 3-7. Stage 2 AAs are to be completed prior to construction.

3.6.2.4 Mulock GO Station

The Stage 1 AA identified the potential for the recovery of both pre-contact and post-contact period archaeological resources, based on the following summary:

- Two previous AAs have been conducted within the Mulock study area. Both studies determined the related portions of the Mulock study area to not require further AA;
- The OASD indicated that there are 17 registered archaeological sites within a one km radius of the Mulock study area. None are situated within 50 metres of the Mulock study area; and
- The Mulock study area is located in close proximity to primary water sources (Holland River) and historic transportation routes (Mulock Drive, the Barrie rail corridor and the Holland River).

Mulock GO Station Stage 1 AA results are presented in Figure 3-8. Stage 2 AAs are to be completed prior to construction.

3.6.2.5 Innisfil GO Station

The Stage 1 AA identified the potential for the recovery of both pre-contact and post-contact period archaeological resources, based on the following summary:

- Eleven previous AAs have been conducted within lots associated with the Innisfil study area. P057-0761-2015 is a Stage 1 AA that assessed lands to the east of the rail corridor, P057-0803-2015 is the Stage 2 AA associated with the previously mentioned Stage 1. The above-noted Stage 1 AA identified the Whan Site (BbGv-54), the Reese Site (BbGv-55), and the Davidson Site (BbGv-56) and recommended all for a Stage 3 AA (ASI, 2015). All sites were subjected to Stage 3 and subsequent Stage 4 AAs. All three sites represented mid-nineteenth-century farmstead sites, none of which are located within the Innisfil study area (ASI, 2016a), (ASI, 2016b), (ASI, 2016c). P316-083-2010 identified that the lands within the Innisfil study area require Stage 2 AA (Poulton, 2010);
- The OASD indicated that there are eight registered archaeological sites within a one km radius of the Innisfil study area. None are situated within 50 metres of the Innisfil study area; and
- The location of the Innisfil study area is in close proximity to secondary water source and historic transportation routes (Barrie rail corridor and 6th Line).

Innisfil GO Station Stage 1 AA results are presented in Figure 3-9. Stage 2 AAs are to be completed prior to construction.

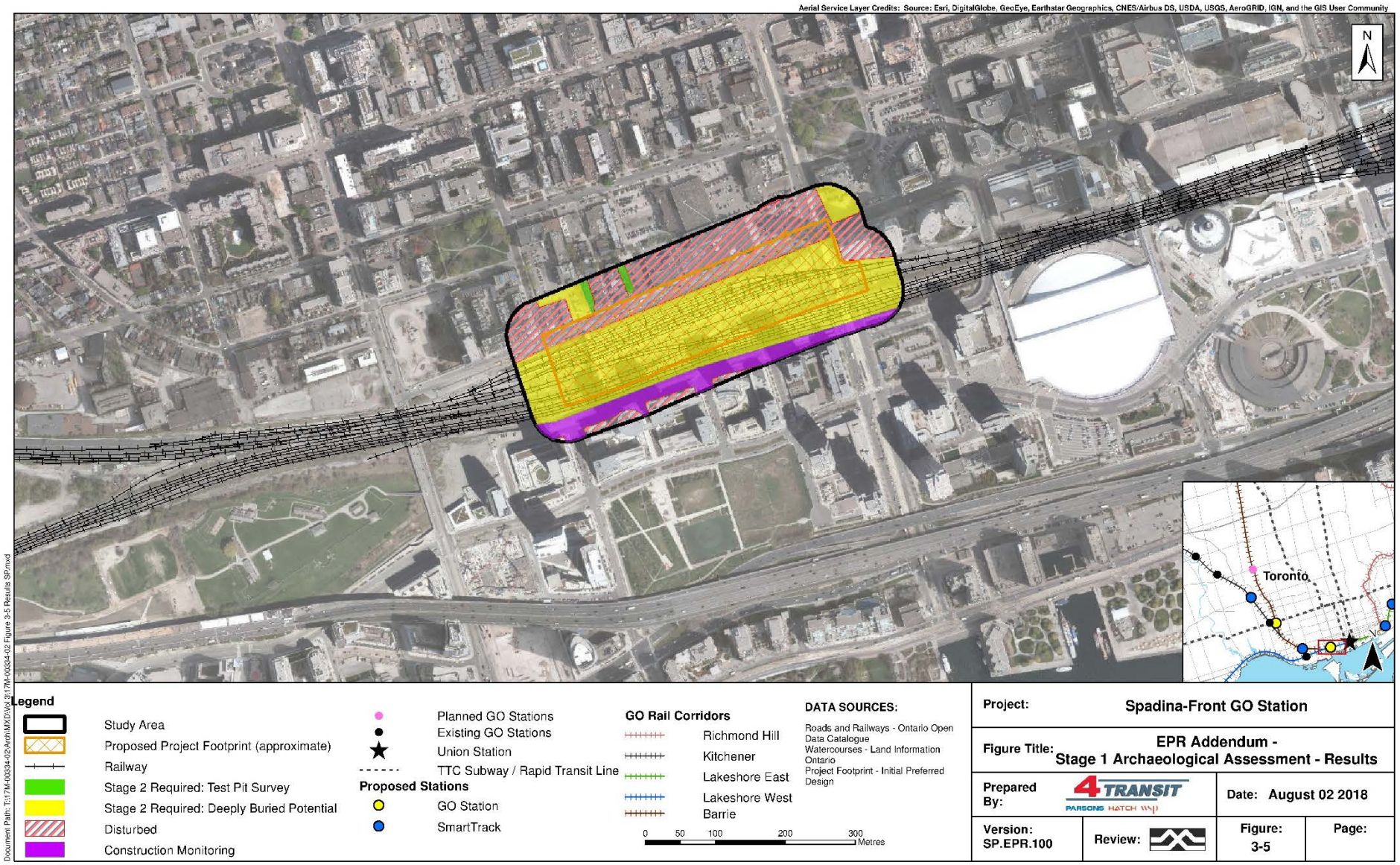


Figure 3-5: Spadina-Front GO Station – Stage 1 Archaeological Assessment Results

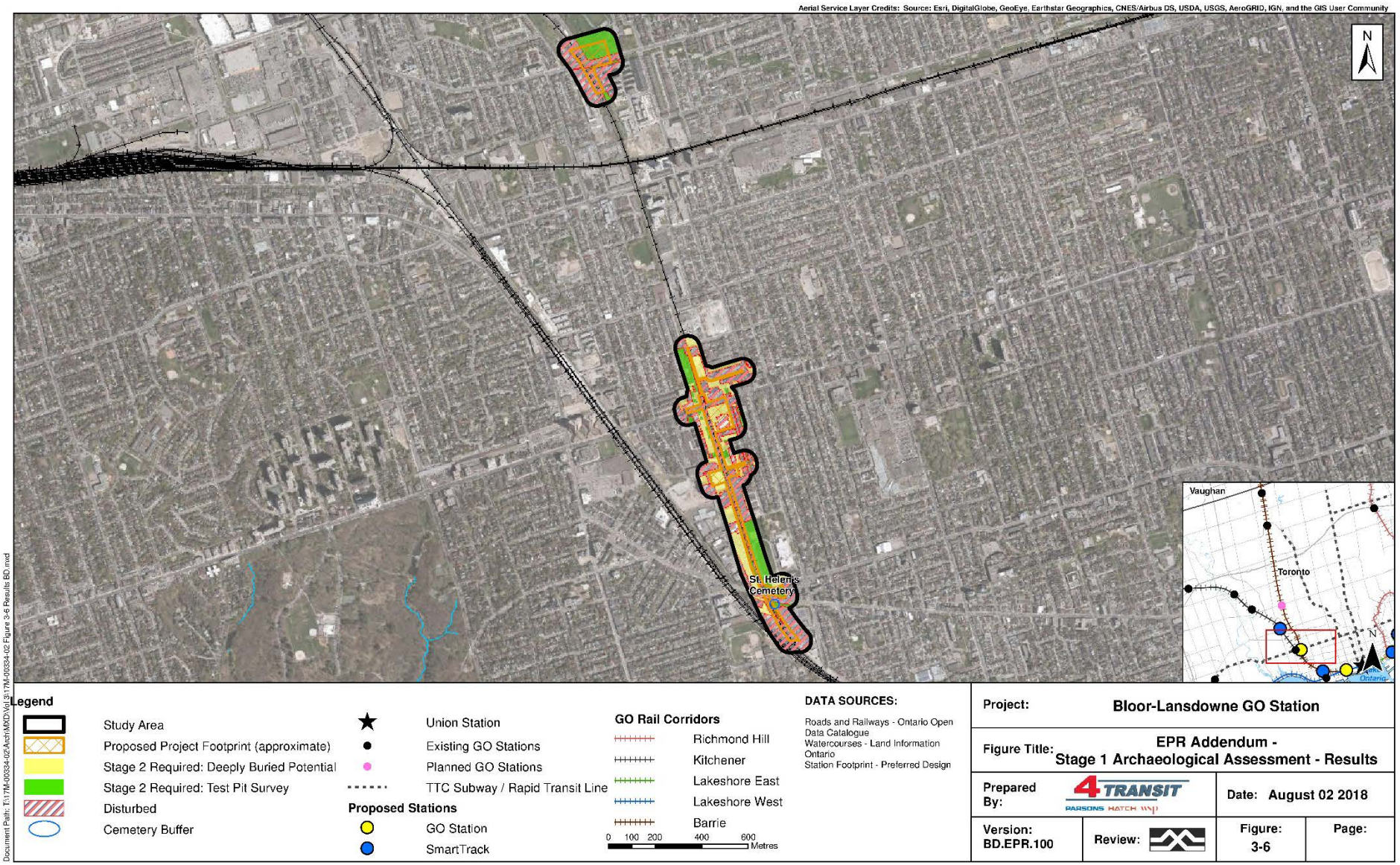


Figure 3-6: Bloor-Lansdowne GO Station – Stage 1 Archaeological Assessment Results

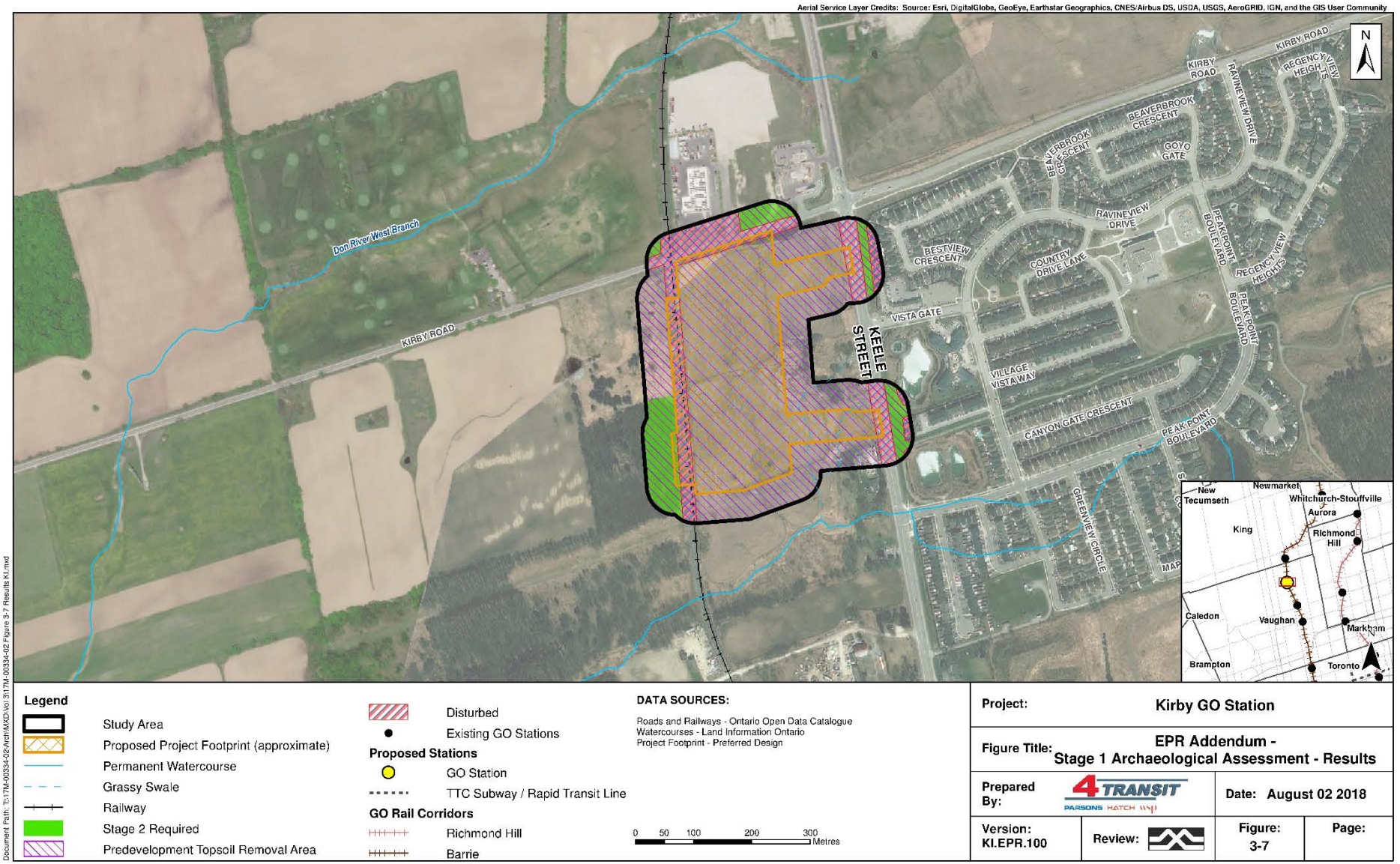


Figure 3-7: Kirby GO Station – Stage 1 Archaeological Assessment Results

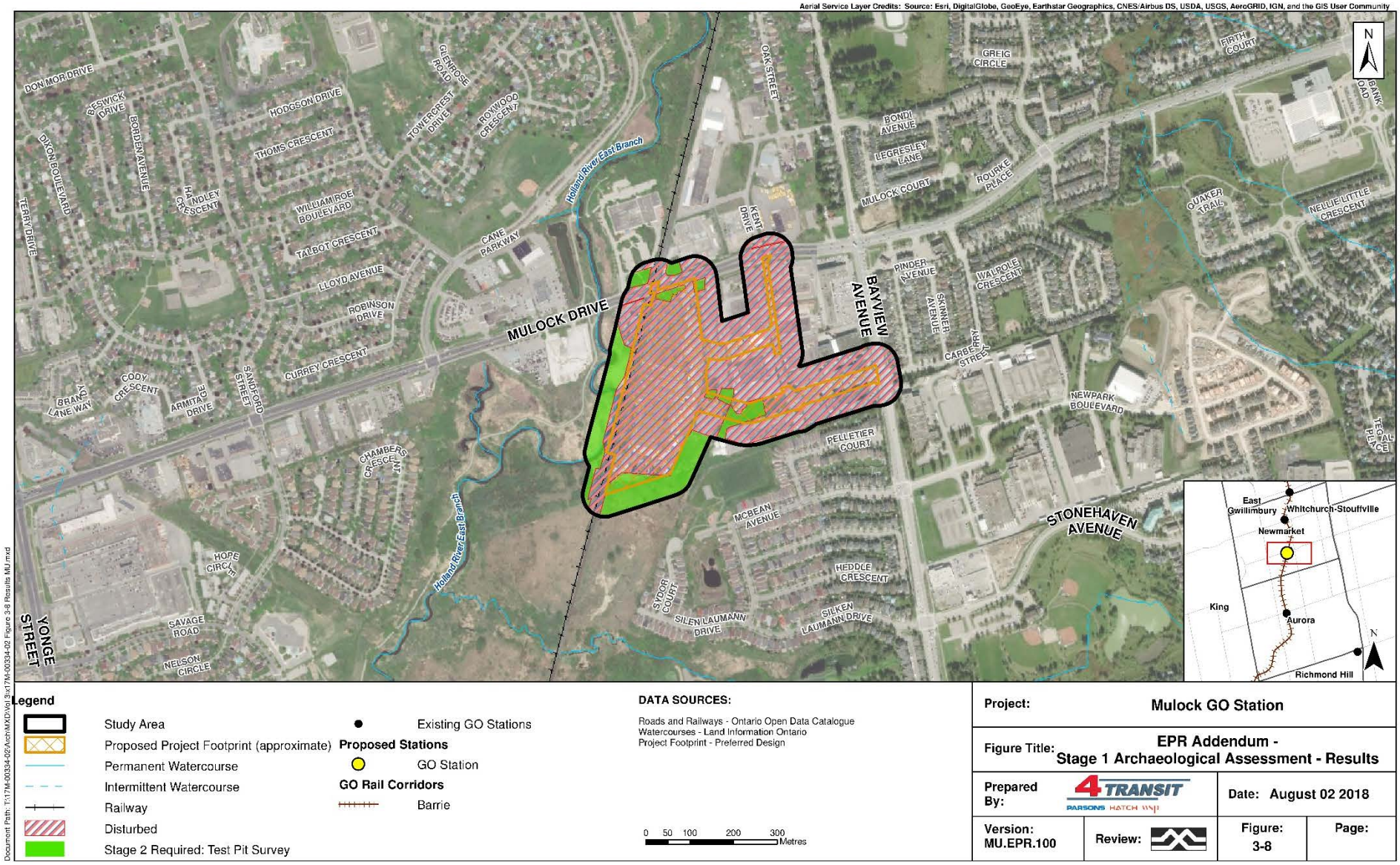


Figure 3-8: Mulock GO Station – Stage 1 Archaeological Assessment Results

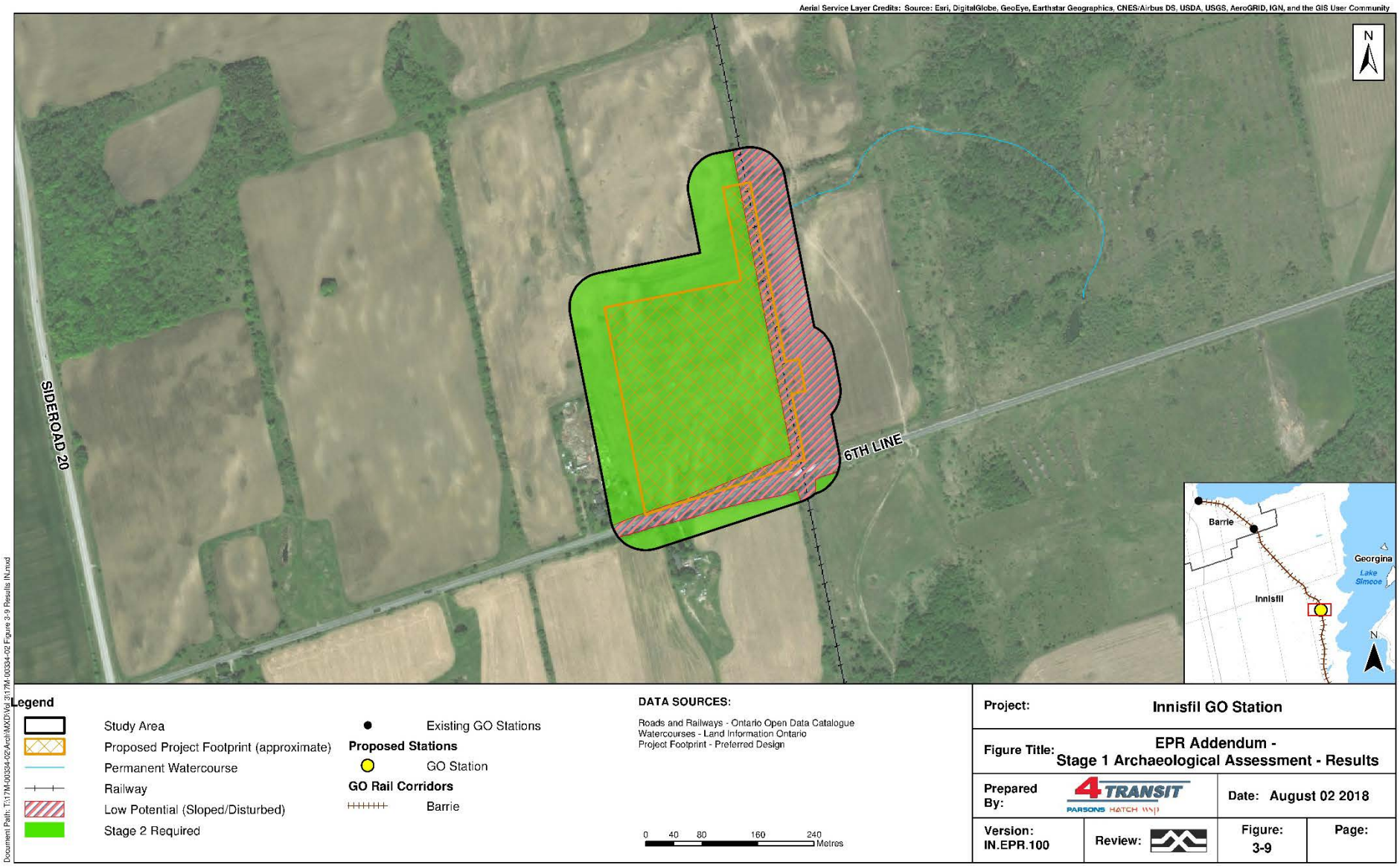


Figure 3-9: Innisfil GO Station – Stage 1 Archaeological Assessment Results

3.7 Cultural Heritage Resources

3.7.1 Methodology

The CHSRs were screened for the presence of built heritage and cultural heritage landscapes (CHLs) associated with the properties to be affected by the undertaking to ensure that Metrolinx fulfils its obligations under the EAA, O. Reg. 231/08 and the OHA.

Properties with no potential were screened out of the cultural heritage process. Properties identified through the screening process as having recognized or potential Cultural Heritage Value or Interest (CHVI) proceed to a high-level evaluation, of one or more properties, by means of a Cultural Heritage Assessment Report (CHAR) or a property-specific evaluation by means of a Cultural Heritage Evaluation Report (CHER). The Metrolinx Heritage Committee reviews the CHER and provides a determination regarding classification of the property, prior to the review by the MTCS.

A Heritage Impact Assessment (HIA) for Provincial Heritage Properties (PHPs) may be required during the TPAP so that MTCS approval/consent is secured prior to issuance of the Notice of EPR Addendum.

On September 1, October 11, October 12, October 25 and October 26, 2017, property visits were conducted and those properties that were visible from the corridor and from the public realm were partly assessed to document the existing conditions within all GO Station study areas. The CHSRs performed for each GO Station had four possible outcomes for screened properties:

- Potential Provincial Heritage Property (Potential PHP), where the property is owned or occupied by Metrolinx, and the answer to at least one of the screening questions is “yes” (except age);
- Conditional Heritage Property (CHP), where the property is not owned or occupied by Metrolinx, and the answer to at least one screening question is “yes” (except age);
- Adjacent Land (Adjacent) where a known and protected heritage property is adjacent to the GO Station study areas; or
- Non-heritage Property, where the property does meet any of the screening criteria.

3.7.2 Cultural Heritage Screening

A summary of key findings and recommendations from the CHSRs is provided below in Table 3-5 based on currently available information. As noted in Section 3.7.3, CHERs were completed for five of the properties.

In July 2018 Cultural Heritage Assessment Reports (CHARs) were prepared for Spadina-Front, Bloor-Lansdowne and Kirby GO Stations to build on the findings of the CHSR and to identify potential adverse impacts to identified cultural heritage resources and to recommend mitigation measures to lessen or avoid any identified impacts. The results of the CHARs are included in Appendix E of Volumes 2, Volume 3 and Volume 4 of this EPR Addendum and in Table 3-5, below.

Table 3-5: Summary Table of Screening Recommendations

CHR #	Name/Municipal Address	Existing Heritage Recognition	CHSR Findings	CHER/CHAR Outcome
Spadina-Front GO Station				
SP-1	Bathurst Street Bridge	Listed Conditional Provincial Heritage Property of Provincial Significance	Adjacent Property	No further work
SP-2	Draper Street, Heritage Conservation District	Part V Designation, OHA (By-Law 026-99)	CHP	No further work
SP-4	571 Wellington Street West/31 Portland Street	Part IV Designated (By-Law 758-79) Part V Designation (King-Spadina HCD, By-law 1111-2017)	CHP	No further work
SP-5	532/530 Front Street West	None	CHP	No further work
SP-6	Fort York, National Historic Site of Canada	Part V Designation, OHA (By-Law 420-85) and National Historic Site of Canada	Adjacent Property	No further work
Bloor-Lansdowne GO Station				
BL-1	158 Sterling Road (Northern Aluminum Company Building)	Part IV Designation, OHA (By-law 969-2005)	CHP	No further work
BL-2	222 Lansdowne Avenue (National Cash Register Company)	Part IV Designation, OHA (By-law 436-2003)	CHP	No further work
BL-3	20 Foundry Avenue	Previous designation removed from property prior to current development Not listed	Non-Heritage Property No further work	No further work
BL-4	226 St Helens Avenue	Not listed	CHER completed. Does not meet criteria under O. Reg. 9/06 or O.	No further work

CHR #	Name/Municipal Address	Existing Heritage Recognition	CHSR Findings	CHER/CHAR Outcome
			Reg. 10/06 of the OHA.	
BL-5	Earlscourt Park	Not listed	CHER completed. Does not meet criteria for O. Reg. 9/06 or O. Reg. 10/06 of the OHA.	No further work.
BL-6	87 Wade Avenue	Not listed	CHP	No further work
BL-7	213 Sterling Road	Not listed	CHP	No further work
BL-8	163 Sterling Road	Not listed	Conditional Heritage Property No further work	No further work
BL-9	17 Dora Avenue	Not listed	Non-Heritage Property No further work.	No further work
BL-10	9 Dora Avenue	Not listed	Non-Heritage Property No further work.	No further work
BL-11	1319 Bloor Street West	Not listed	Non-Heritage Property No further work.	No further work
BL-12	1364 Bloor Street West	Not listed	Non-Heritage Property No further work.	No further work
Kirby GO Station				
KI-1	2480 Kirby Road	Listed	CHP	No further work
KI-2	11390 Keele Street	Listed	Non-Heritage Property	No further work
KI-3	11320 Keele Street	None	CHP	No further work
Mulock GO Station				
-	No properties with CHVI were identified	-	-	-
Innisfil GO Station				
IN-1	1350 6th Line	Part IV Designation, OHA (CR-454.09).	CHP	CHER (to evaluate against O. Reg.10/06) HIA required during detailed design.
IN-2	John Cowan Overpass	None	CHP	No further work
IN-3	1323 6th Line	None	CHP	No further work.

Cultural heritage screening results for each GO Station are shown in Figure 3-10, Figure 3-11, Figure 3-12 and Figure 3-13. There is no figure for the Mulock GO Station since there were no properties with recognized or potential CHVI identified.

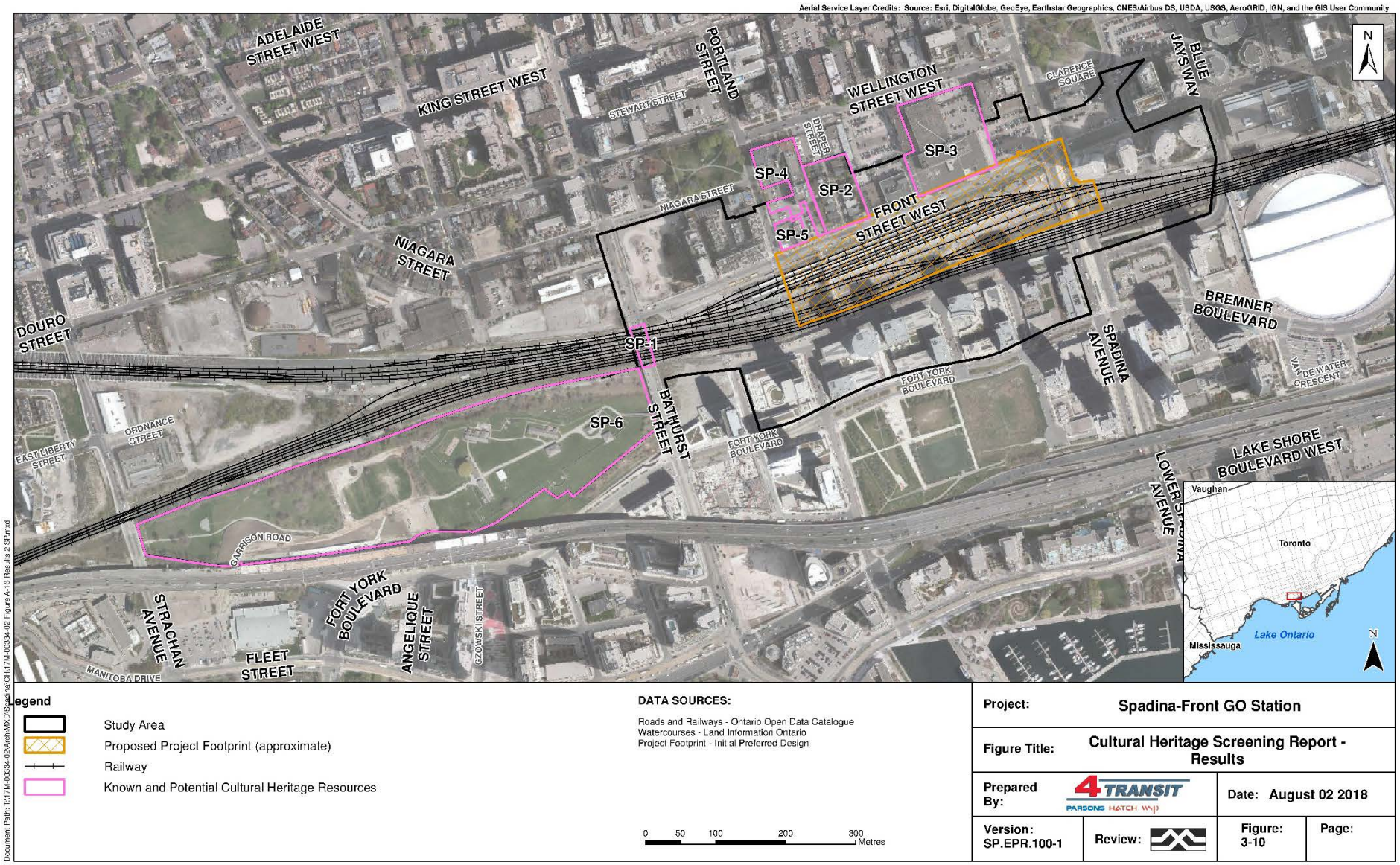


Figure 3-10: Spadina-Front GO Station – Cultural Heritage Screening Report Results

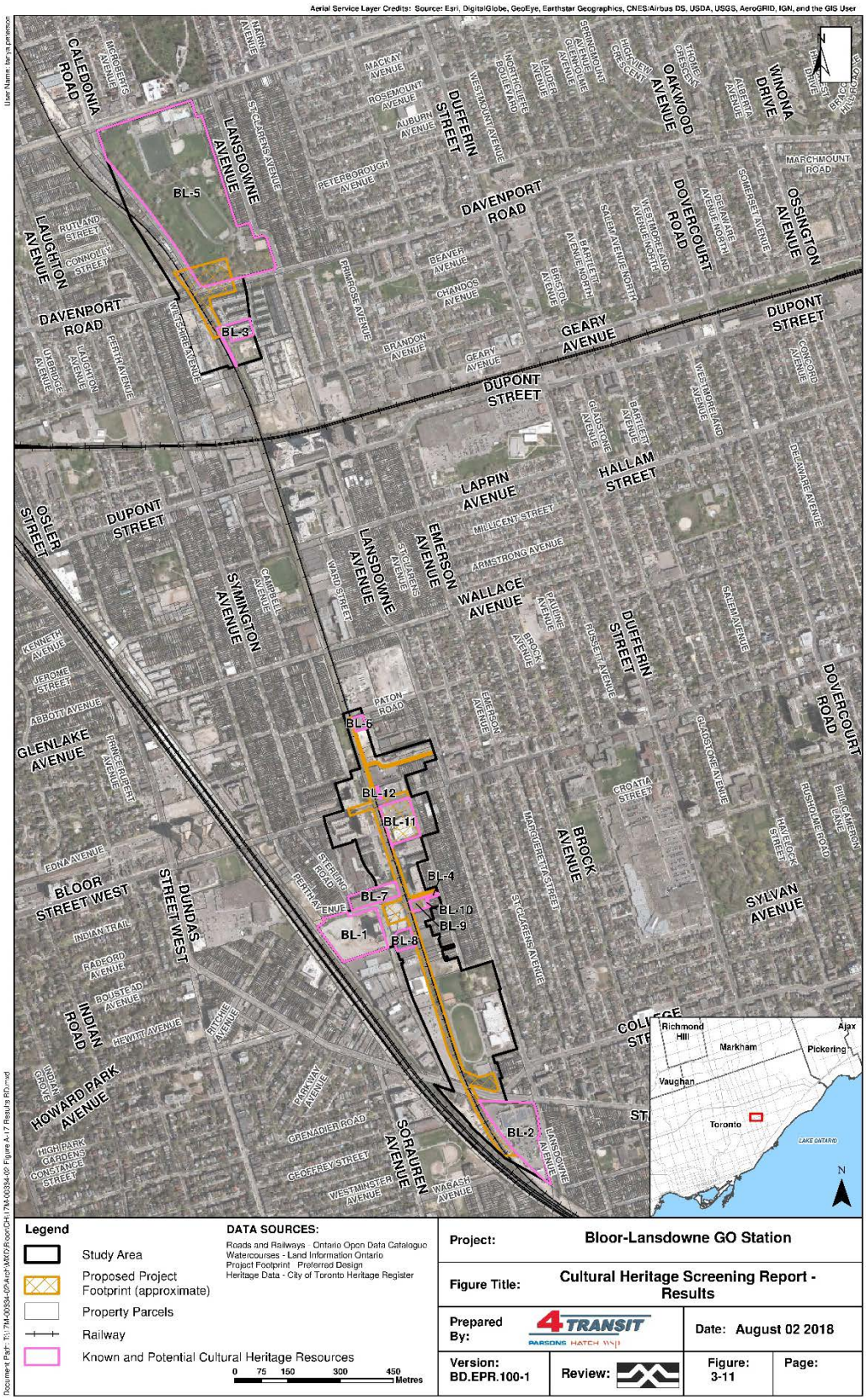


Figure 3-11: Bloor-Lansdowne GO Station – Cultural Heritage Screening Report Results

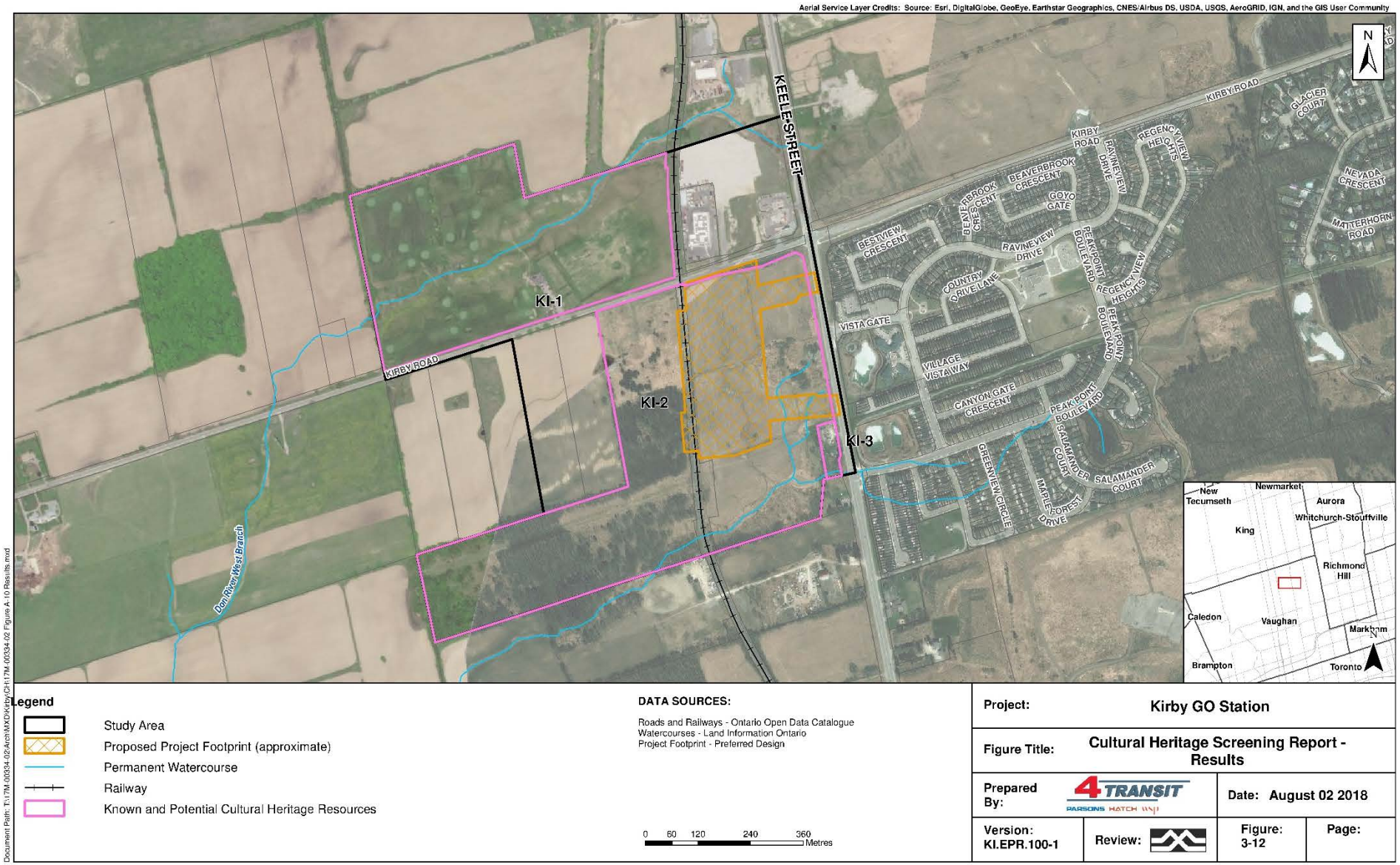


Figure 3-12: Kirby GO Station – Cultural Heritage Screening Report Results

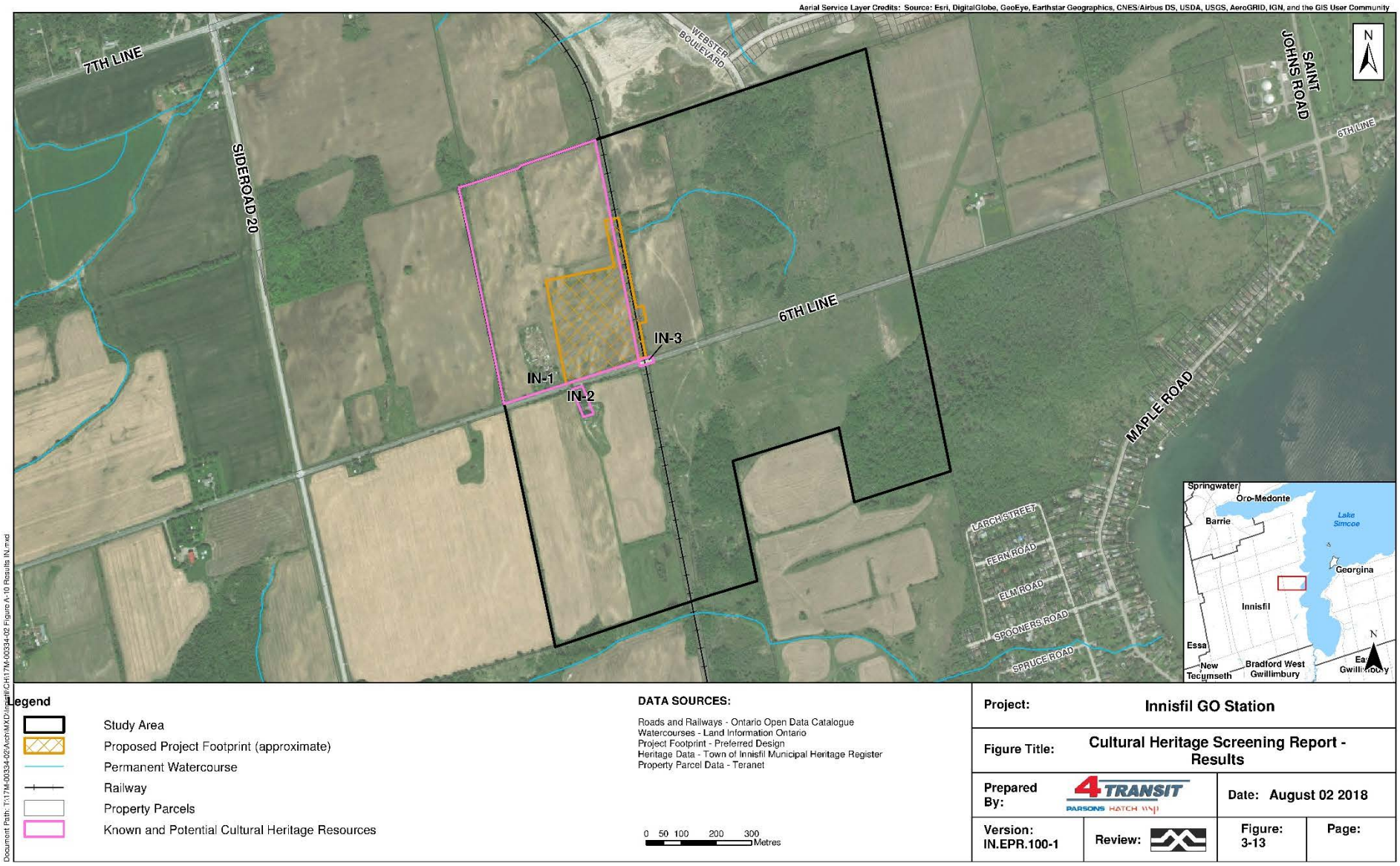


Figure 3-13: Innisfil GO Station – Cultural Heritage Screening Report Results

3.7.3 Cultural Heritage Evaluation

Five CHERs were completed in accordance with the Metrolinx Interim Cultural Heritage Management Process and utilizing the criteria in O. Reg. 9/06 and O. Reg. 10/06, as required by the MTCS Standards and Guidelines (2010). In addition, the CHERs were prepared according to Metrolinx Draft Terms of Reference for Consultants: Cultural Heritage Evaluation Report and Cultural Heritage Evaluation Recommendations Report. CHERs were prepared for five CHPs, as listed below, which were identified through the screening as potentially directly or indirectly affected by the GO Stations.

- Bloor-Lansdowne GO Station:
  - 226 St Helens Avenue; and
  - Earlscourt Park.
- Kirby GO Station:
  - 11390 Keele Street, Listed.
- Innisfil GO Station:
  - 1323 6th Line; and
  - John Cowan Overpass.

From these CHERs, none of the above-mentioned CHRs was found to meet the criteria under O. Reg. 9/06 and no properties met the criteria under O. Reg. 10/06.

3.8 Socio-Economic Environment and Land Use

3.8.1 Methodology

Statistics were compiled in order to describe the current and future social and economic context which will influence the use of the GO Stations, as well as land use and growth in the vicinity of the GO Stations. Statistics were not specifically available for the GO Station study areas. As such, demographics, social and economic conditions are broadly generalized based on information for single-tier and upper-tier municipalities around the GO Stations. Additional details regarding the socio-economic environment can be found within the SELUS' provided in Appendix F of Volume 2 through Volume 6 of this EPR Addendum.

A desktop review and site visit to determine existing conditions was undertaken for the GO Station study areas. The desktop review included relevant policy and planning documents at the provincial and municipal levels, and data provided by the municipalities, Statistics Canada, TRCA, LSRCA, and transit networks.

Characteristics of the built environment within the study area were assessed through a site visit. The site visit allowed for verification of desktop data and documentation of socio-economic and land use features in the study area. Photographs from the site visit were also documented.

3.8.2 Current Population

Recent population data for each single-tier and upper-tier municipality around the GO Stations are provided in Table 3-6. As noted therein, the population growth over this period is also

summarized and compared to Ontario as a whole. Population changes in all municipalities except for the City of Toronto were higher than that of Ontario from 2011 to 2016.

Table 3-6: Population Changes in Communities Around the GO Stations

GO Station	Geographic Area	2011 Population	2016 Population	% Change (2011-2016)
-	Ontario[1]	12,851,821	13,448,494	4.6%
Spadina Front GO Station[2]	City of Toronto	2,704,600	2,876,095	6.3%
Bloor-Lansdowne GO Station[2]	City of Toronto	2,704,600	2,876,095	6.3%
Kirby GO Station	City of Vaughan[3]	288,301	306,233	6.2%
	York Region[4]	1,032,534	1,109,909	7.5%
Mulock GO Station	Town of Newmarket[5]	79,978	84,224	5.3%
	York Region[4]	1,032,534	1,109,909	7.5%
Innisfil GO Station	Town of Innisfil[6]	32,727	36,566	11.7%
	County of Simcoe[7]	446,063	479,650	7.5%

[1] (Statistics Canada, 2017a) (Statistics Canada, 2015a)
[2] Source: (City of Toronto, 2017a)
[3] Source: (Statistics Canada, 2017b)
[4] Source: (Statistics Canada, 2017c), (Statistics Canada, 2015c)
[5] Source: (Statistics Canada, 2017c), (Statistics Canada, 2015b)
[6] Source: (Statistics Canada, 2015d), (Statistics Canada, 2017d)
[7] Source: (Statistics Canada, 2015e), (Statistics Canada, 2017e)

3.8.3 Projected Population Growth

Population forecasts for the upper-tier municipalities were obtained from the GPGGH and from municipal plans. The population of all municipalities are expected to increase significantly in the future, as summarized in Table 3-7.

Table 3-7: Population Profile and Population Projections of Affected Municipalities

Demographic	City of Toronto[1]	Town of Newmarket[2]	City of Vaughan[3]	York Region[4]	Town of Innisfil[5]	County of Simcoe (including Barrie and Orillia)[6]	Province of Ontario[1]
2011 Population	2,704,600	79,978	288,301	1,032,534	32,727	446,063	12,851,821
2016 Population	2,876,095	84,224	306,233	1,109,909	36,566	479,650	13,448,494
2031 Predicted Population	3,537,157	100,800	416,600	1,500,000	56,000	667,000	16,658,591
2011-2016 Population Change	6.3%	5.3%	6.2%	7.5%	11.7%	7.5%	4.6%
Predicted Population Growth 2016-2031	23.0%	19.7%	36%	35%	53.1%	39.1%	23.9%

[1] *Source: (City of Toronto, 2017a)*
[2] *Source: (Statistics Canada, 2017c)(Statistics Canada, 2015b)*
[3] *(Statistics Canada, 2017b) (York Region, 2016b)*
[4] *Source: (Statistics Canada, 2017b)(Statistics Canada, 2015c)*
[5] *Source: (Statistics Canada, 2017d)(Statistics Canada, 2015d)*
[6] *Source: (Statistics Canada, 2017e)(Statistics Canada, 2015a) (MMA, 2017)*

3.8.4 Secondary Plan and Other Growth Areas

As noted above, communities around the GO Stations within all study areas have growth targets provided within the GPGGH (2013 Consolidation) and within municipal plans. In order to meet targets, land use changes and intensification are expected in a number of locations around the GO stations study areas. There are several areas directly adjacent, or in close proximity to, the GO Stations which are the subject of Secondary Plans. These areas are specifically identified for new growth and development and are expected to provide a significant number of new homes and increased population. Current Secondary Plan and Growth Areas around the GO Stations are summarized in Table 3-8. These areas are within walking distance of easy transit access such that new residents could reasonably make use of the expanded rail service (within the 500 metre study areas).

Table 3-8: Secondary Plans and Other Growth Areas

Growth Area	Description of Secondary Plan/Growth Area
Spadina-Front GO Station	
King-Spadina Secondary Plan	The King-Spadina Area will provide for a mixture of compatible land uses with the flexibility to evolve as the neighbourhood matures. As per the Secondary Plan, the King-Spadina Area is an important employment area. Accordingly, the retention and promotion of commercial and light industrial uses including media, design and fashion businesses within the area is a priority. Commercial activity, including the retail service industry, which supports the changing demands of the King-Spadina Area will be provided for, to ensure the necessary services for the new residents and businesses of the area.
Railway Lands Central Secondary Plan	The Railway Lands Central, extending from Spadina Avenue to John Street, north of Lake Shore Boulevard, and south of Front Street West, will be developed as an integral part of the Downtown so that the barrier effects of the road and rail corridors will be minimized and the central City reunited with the Central Waterfront. New development in the Railway Lands Central should have a mix of uses, and a form, character and environmental quality which will ensure that the area is used by people for a wide variety of purposes throughout each day.
Railway Lands West Secondary Plan	The development of the Railway Lands West will proceed in accordance with the following major objectives for the Railway Lands West. The Railway Lands West is the area of the city generally bounded by Front Street West, the Gardiner–Lake Shore Corridor, Bathurst Street and Simcoe Street. The Railway Lands West will be developed as an integral part of the Downtown so that the barrier effects of the road and rail corridors will be minimized and the central City reunited with the Central Waterfront. New development in the Railway Lands West should have a mix of uses, and a form, character and environmental quality which will ensure that the area is used by people for a wide variety of purposes throughout each day.

Growth Area	Description of Secondary Plan/Growth Area
Fort York Secondary Plan	The Fort York Neighbourhood, extending west of Bathurst Street to Strachan Avenue, south of the railway and north of Lake Shore Boulevard West, will be developed as a vital mixed use neighbourhood which takes advantage of large areas of existing public open space in a unique waterfront setting and is served by the appropriate range of community services and facilities. The new neighbourhood will be primarily residential, with non-residential uses located mainly along Bathurst Street and Lake Shore Boulevard West.
Garrison Common North Secondary Plan	New development within Garrison Common North, west of Bathurst Street to Dufferin Street, north of the railway extending to Queen Street West, will: be integrated into the established city fabric in terms of streets and blocks, uses and density patterns; enhance the public open space system by completing the existing north-south public open space system, providing both visual and physical connections to Fort York and the waterfront; include a variety of land use and densities including community services and facilities, so that development can respond to changing market demands over time and provide services for new residents and tenants; provide for a range of housing types in terms of size, type, affordability and tenure, to encourage households of all sizes to locate within Garrison Common North; and be sensitive to and protect industrial, communications and media operations, solidifying the area as one of the leading locations for new industry technologies.
Bloor-Lansdowne GO Station – South Study Area	
No Secondary Plan or Growth Area within the Bloor-Lansdowne south study area	-
Bloor-Lansdowne GO Station – North Study Area	
Davenport Village Secondary Plan	The north study area is located within the Davenport Village Secondary Plan. It includes lands generally bounded by Lansdowne Avenue to the east, the Canadian Pacific Railway (CPR) line (18 metres south of and parallel to Davenport Road) to the north, lands owned and operated by Metrolinx/GO Transit to the west and Dupont Street to the south. The Secondary Plan will be developed as an extension of the residential neighbourhood east of the Earlscourt Bridge site and may contain up to 1960 dwelling units. The Secondary Plan incorporates a mix of residential units, including townhouses and apartments.
Kirby GO Station	
Block 27 Secondary Plan	Development of the lands adjacent to the GO Station has been identified in the Block 27 Secondary Plan, which is currently being developed by the City of Vaughan but has not yet been approved. As part of the Block 27 area, there is

Growth Area	Description of Secondary Plan/Growth Area
	a proposed multi-use path that will travel along the TransCanada pipeline, to the south of the GO Station footprint. According to Schedule 13, Land Use, from the VOP 2010, lands within Block 27 are currently designated as "New Community Areas", "Natural Areas", "Rural" with "Hamlet" overlay and "Agricultural", and lands within the western part of Block 27 are identified as part of the Greenbelt Plan area. Block 27 is recognized as one of the required Secondary Plan Areas (City of Vaughan, 2017b). The ongoing Secondary Plan will provide detailed land use guidance for the study area and the entirety of Block 27. Through the Secondary Planning process, the "New Community Area" will be designed to be compact. It is proposed that the land uses will include a mix of commercial, low and mid-rise residential housing, as well as community facilities. The City has identified the GO Station to be located within Block 27. It is envisioned that the GO Station will be multimodal (i.e., supporting different transportation options) surrounded by mixed land uses, consistent with provincial, regional and City of Vaughan policies.
Mulock GO Station	
Mulock Station Area Secondary Plan	The Secondary Plan will encompass lands around the Mulock GO Station. A Request for Proposal (RFP) for this Secondary Plan was recently issued (May 2018). The Secondary Plan will address future development in the area surrounding the Mulock GO Station. Specifically, it will ensure: that transportation network is well integrated with existing transit systems and with all modes of travel including pedestrians, cyclists and cars; that future road networks and land uses are determined and that provincial density requirements are met, and that urban design in the area is of high quality and oriented toward transit (Town of Newmarket, 2018).
Innisfil GO Station	
Alcona South Secondary Plan	The study area is located almost entirely within the Alcona South Secondary Plan area. The Secondary Plan covers a portion of the Alcona Primary Settlement Area. The Secondary Plan extends west to 20 Sideroad, north to Innisfil Beach Road, approximately one kilometre east of the Barrie rail corridor and approximately 500 metres south of 6th Line. The Alcona South Secondary Plan area lands are to be developed into a mixed-use neighbourhood consisting of a mix of——— housing types and densities, a mixed-use node including employment opportunities and commercial facilities, and a balanced network of parks. They are intended to accommodate the population growth of Innisfil to the year 2031 (Town of Innisfil, 2013a).

Growth Area	Description of Secondary Plan/Growth Area
Alcona South Secondary Plan (Sleeping Lion)	This Secondary Plan was approved by the Town in May 2013 and by the County of Simcoe in August 2013. It was approved in advance of the adoption of the Alcona South Secondary Plan.

3.8.5 Employment Projections

Employment targets for the single and upper-tier municipalities are shown in Table 3-9 for the years 2011, 2031, 2036 and 2041, as indicated in the GPGGH and in municipal plans. All areas are forecasted to grow substantially, providing the incentive for their economic development initiatives and the need for supporting infrastructure (MMA, 2017).

Table 3-9: Employment Targets for Study Area Municipalities

GO Station	Geographical Area	2011 Employment	2031 Employment	2036 Employment	2041 Employment	Projected % Change (2011 to 2041)
Spadina-Front GO Station	City of Toronto[1]	1,540,000	1,660,000	1,680,000	1,720,000	11.7%
Bloor-Lansdowne GO Station	City of Toronto[1]	1,540,000	1,660,000	1,680,000	1,720,000	11.7%
Kirby GO Station	City of Vaughan[2]	N/A	266,100	N/A	N/A	N/A
	York Region[1]	590,000	790,000	840,000	900,000	34.4%
Mulock GO Station	Town of Newmarket[2]	N/A	49,400	N/A	N/A	N/A
	York Region[1]	590,000	790,000	840,000	900,000	34.4%
Innisfil GO Station	Town of Innisfil[3]	N/A	13,100	N/A	N/A	N/A
	County of Simcoe[1]	102,000	132,000	114,000	152,000	32.9%

[1] *Source: (MMA, 2017)*
[2] *Source: (York Region, 2016b)*
[3] *Source: (County of Simcoe, 2016)*

3.8.6 Existing Land Use

Within all study areas, land uses differ widely and include a variety of residential, commercial, industrial, natural and open space, recreational, agricultural and institutional uses. Both current and planned (future) conditions were reviewed in order to inform the assessment of potential effects.

From south to north the Spadina-Front GO Station and the Bloor-Lansdowne study areas in the City of Toronto are highly urbanized and include a variety of residential and employment uses. The Kirby study area in the City of Vaughan is composed of agricultural, commercial, and residential land. The Mulock study area in the Town of Newmarket provides a more urban setting with some natural heritage features along the corridor. Further to the north, the Innisfil GO Station is predominantly rural. Existing land uses were identified within 500 metres from each GO Station and are documented below. Study area neighbourhoods were defined by their existing socio-economic and land use features. These features were categorized as follows:

- Institutional Uses – Generally include elementary, secondary and post-secondary schools, religious institutions and government institutions;
- Recreational Uses, Parks and Open Spaces – Generally include recreational centres, community amenities, parks and open spaces, and protected areas; and
- Community Groups and Resources – Generally include groups or organizations that work toward community benefit.

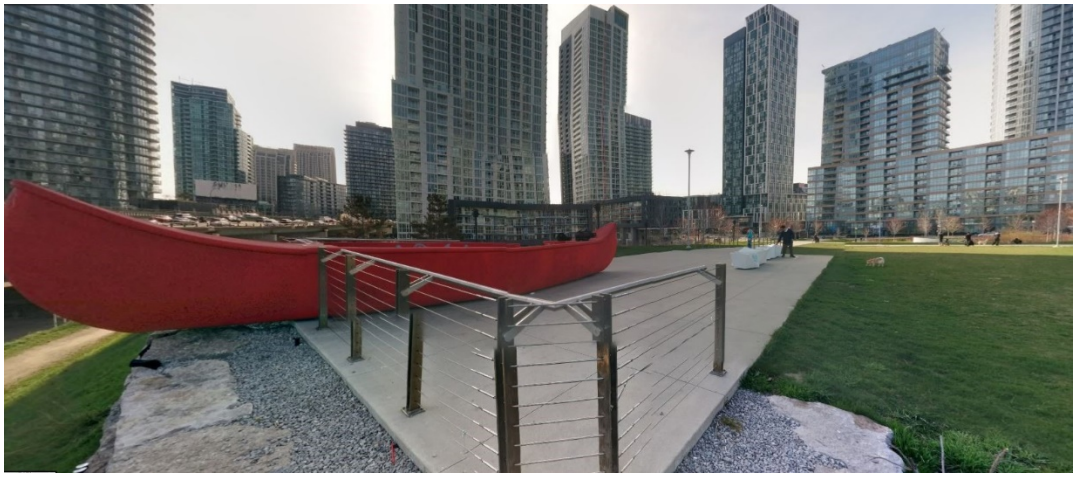
3.8.6.1 Spadina-Front GO Station

The Spadina-Front study area in the City of Toronto is highly urbanized with densely populated neighbourhoods including a variety of residential, commercial, office, entertainment, industrial, park land and school uses (Photograph 3-6). There are three schools within the Spadina-Front study area, two religious institutions, a library, one community group and resource, and six parks/open spaces. Institutional uses, recreational uses, parks and open spaces, and community groups and resources in the Spadina-Front study area are listed in Table 3-10.

Table 3-10: Spadina-Front Study Area Socio-Economic and Land Use Features

Institutional Uses
Fu Sien Buddhist Temple
Evangel Hall
Discovering Minds Montessori Preschool
City School
Oasis Alternative Secondary School
Fort York Library
Community Groups and Resources
Cityplace Residents' Association

King-Spadina Residents Association
Niagara Neighbourhood Now
Toronto Entertainment District Resident's Association
Bathurst Quay Neighbourhood Association
Fort York Neighbourhood Association
Recreation Uses, Parks and Open Spaces
Rogers Centre
Garrison Common
Victoria Memorial Square Park
Clarence Square Park
Canoe Landing
Northern Linear Parks



Photograph 3-6: Spadina-Front Study Area – Existing Land Use

3.8.6.2 Bloor-Lansdowne GO Station

The Bloor-Lansdowne study area in the City of Toronto is highly urbanized with densely populated neighbourhoods including a variety of residential, commercial, industrial, park land and school uses (Photograph 3-7). There are eight schools within the Bloor-Lansdowne study area, 21 religious institutions, six community groups and resources, and 18 parks/open spaces, including the Earlscourt Park. Institutional uses, recreational uses, parks and open spaces, and community groups and resources in the Bloor-Lansdowne study area are listed in Table 3-11.

Table 3-11: Bloor-Lansdowne Study Area Socio-Economic and Land Use Features[1]

South Study Area	North Study Area
Institutional Uses	
Brock Avenue Gospel Hall	Church of God Apostolic
The City Church	Canadian Hindu Satsang Organization
Our Lady of Croatia	North Toronto Chinese Baptist Church
St. Helen Church	St John The Evangelist Catholic Elementary School
Olivet Baptist Church	École élémentaire Charles Sauriol
Chua Linh-Soh	-
St. Sebastian's Church	-
Islamic Information and Dawah Centre	-
Sri Menatchy Amman Society	-
Britten Memorial Church	-
Bhuddhist Association of Canada	-
Church of the Crusaders	-
Belarussian Autocephlous	-
Perth Avenue Seventh Day	-
Church of the Firstborn	-
Kingdom Hall of Jehovas' Witnesses	-
Hindu Prarthana Samaj	-
Centre of Gravity Sangha	-
Brock Junior Public School	-
Shirley Street Junior Public School	-
Pauline Junior Public School (Ontario Early Years Centre)	-
Bishop Marrocco Thomas Merton Catholic Secondary School	-
Park Place LINC Centre	-
École secondaire catholique Saint-Frère-André	-
City View Alternative Senior School	-
Brockton High School	-

South Study Area	North Study Area
St. Sebastian Catholic School	-
Brockton Learning Centre	-
École secondaire Toronto Ouest	-
Community Groups and Resources	
Homes First Society – Savards (Women's shelter)	Christie-Ossington Men's Shelter
-	The Stop Drop-In
-	Davenport-Perth Drop-In
-	Davenport Perth Neighbourhood and Community Health Centre
-	Community Action Resource Centre (Ontario Early Years)
Recreational Uses, Parks and Open Spaces	
West Lodge Park	Earlscourt Park
Charles G Williams Park	Symington Avenue Playground
Sorauren Avenue Park	Pelham Avenue Playground
Columbus Parkette	Davenport Village Park
Ritchie Avenue Parkette	Primrose Avenue Parkette
Dundas Street Clarens Parkette	Beaver-Lightbourn Parkette
Macgregor Playground	Wadsworth Park
Perth Avenue Parkette	Joseph J. Piccininni Community Centre
Erwin Krickhahn Park	-
Susan Tibaldi Parkette	-

[1] *Source from City of Toronto Open Data*

Photograph 3-7: Bloor-Lansdowne Study Area – Existing Land Use

3.8.6.3 Kirby GO Station

The Kirby study area in the City of Vaughan is primarily composed of agricultural land uses (Photograph 3-8). The arterial roads in the Kirby study area are Kirby Road and Keele Street. South of Kirby Road and east of Keele Street there is a residential neighbourhood. The neighbourhood composition is mostly made up of single detached houses with two storeys, and the residential streets have sidewalks on both sides. The residential area includes Sherwood Court Long Term Care, the St Raphael the Archangel Catholic Elementary School and the Shining Light Montessori School, as well as some commercial uses in a plaza just east of Keele Street. There are some commercial uses west of Keele Street and north of Kirby Road, including a Petro-Canada gas station, a Tim Hortons, and the Mid Ontario Truck Centre. There are no community groups and resources within the Kirby study area. The Kirby GO Station study area is within the Mackenzie Ridge Ratepayers Association catchment area (City of Vaughan, 2018b). Institutional uses, recreational uses, and parks and open spaces in the Kirby study area are listed in Table 3-12.

Table 3-12: Kirby Area Socio-Economic and Land Use Features

Institutional Uses
The Archangel Catholic Elementary School
The Shining Light Montessori School
Recreational Uses, Parks and Open Spaces
Vista Gate Parkway
Peak Point Park

Photograph 3-8: Kirby Study Area – Existing Land Use

3.8.6.4 Mulock GO Station

The Mulock study area in the Town of Newmarket provides an urban setting with some natural heritage features along the corridor (Figure 3-13). The Newmarket Town Hall is within the Mulock study area, and there is one school and six parks/open spaces within the Mulock study area. There are no community groups and resources within the Mulock study area. Institutional uses, recreational uses, and parks and open spaces in the Mulock study area are listed in Table 3-13.

Table 3-13: Mulock Study Area Socio-Economic and Land Use Features

Institutional Uses
Newmarket Town Hall
Pickering College
Recreation Uses, Parks and Open Spaces
The Wesley Brooks Conservation Area
Dennis Park
Bailey Ecological Park
Audrie Sanderson Park
Willowick Park
Arhem Park

Photograph 3-9: Mulock Study Area – Existing Land Use

3.8.6.5 Innisfil GO Station

The Innisfil study area is predominantly rural at this time (Photograph 3-10). The portion of the study area east of the Barrie rail corridor is part of the Alcona Primary Settlement Area, a portion of which is being developed as part of the Sleeping Lion Subdivision. Currently the only Community Group that has a presence within the study area includes the Innisfil District

Association. Within the study area, there are two areas identified as parks and open space within the Alcona South Secondary Plan (Sleeping Lion), including a long segment extending along the east side of the Barrie rail corridor, as well as a small area located within the residential area (mid-block between the Barrie rail corridor and the future extension of Webster Boulevard). The Community Commercial/Mixed Use Area within the Alcona South Secondary Plan (Sleeping Lion) extends just north of 6th Line and east of the Barrie rail corridor. Further details related to the permitted uses are outlined in Section 3.8.7.5 of this EPR Addendum.

Photograph 3-10: Innisfil Study Area – Existing Land Use

3.8.7 Planned (Future) Conditions

A comparison of existing and future land uses, as prescribed in applicable OPs, indicates that most land use in all study areas is projected to remain relatively stable and consistent with its existing use. Specifically, most highly urbanized areas will remain so, and most rural and agricultural areas will continue to be used for the same purposes. Exceptions are noted in specific intensification and redevelopment areas identified through Secondary Plans or other growth plans. The GPGGH provides growth targets for each of the municipalities around the GO Stations, refered to as Major Transit Station Areas. In order to meet the specific targets noted within the GPGGH, land use changes and intensification are expected in a number of locations around the GO Stations. The planned or anticipated land use changes on lands directly adjacent to the GO Stations are described in the sections below.

3.8.7.1 Spadina-Front GO Station

The City of Toronto OP was consolidated and approved by the Ontario Municipal Board (OMB), now Local Planning Appeal Tribunal (LPAT) in June 2015. The OP addresses elements of effective, sustainable and successful city-building, while also addressing growth to the year

2031 (City of Toronto, 2015). The GO Station will support the City of Toronto's direction to accommodate future growth, and provide infrastructure to promote active transportation. The City of Toronto OP delineates land use designations within the Spadina-Front study area on OP Area E. The lands within the proposed Spadina-Front GO Station study area are overwhelmingly designated "Mixed Use Areas" and "Regeneration Areas". Nearly all land use south of Front Street, except for park space and the rail corridor, is designated as "Mixed Use Areas". To the west of Bathurst Street are designated as "Neighbourhoods". Most of the Spadina-Front study area north of Front Street is designated as a "Regeneration Areas". Section 2.2 of the City of Toronto OP identifies "Avenues", "Downtown" and "Central Waterfront" urban structure designations within the Spadina-Front study area.

The City of Toronto Zoning By-Law No. 438-86 and 569-2013 implements many of the policies of the City's OP, which focuses growth within the urban part of the City; promotes increased transit ridership; emphasizes good urban design; preserves environmental integrity; and will achieve compact mixed-use communities. Some of the designations within the Former City of Toronto Bylaw (No.438-86) are still applicable to areas south of the railway corridor, which have not yet been harmonized. There is a need to consider both the current City of Toronto By-law 569-2013, as well as By-Law 438-86. Lands within the Spadina-Front study area are designated as a range of zones including commercial-residential, residential, and commercial (City of Toronto, 2013).

The City of Toronto Cycling Network Ten Year Plan was approved by City Council in June 2016. It outlines existing rail lines, freeways, major roads, and green spaces, existing and planned bike lanes/cycle tracks, trails/boulevard trails, quiet street routes, and planned tunnels and bridges, as well as major corridor studies (City of Toronto, 2016a).

The City of Toronto Planning Services website was consulted to confirm the status of current development applications within the Spadina-Front study area. There are 35 development applications within the Spadina-Front study area. These are presented in Table 3-14.

Table 3-14: Development Applications within the Spadina-Front Study Area

Address File Number	Application Summary	Application Status
500 Lakeshore Boulevard West *17 183100 STE 20 OZ* *16 168927 STE 20 SA* *14 238671 STE 20 SA*	This application is for amendments to existing Official Plan Amendment (OPA) and Site Plan Approval. Proposed amendments are comprised of additional non-residential GFA located at grade below the Gardiner Expressway, and a reduction of commercial parking requirements.	Under review.
20 Brunel Court *15 268121 STE 20 OZ*	Zoning By-law Amendment. The proposal is comprised of a shared community facility which will include a community centre, a child care centre and two elementary schools. The building is proposed to be three storeys.	Under review.
23 Spadina Avenue *14 204227 STE 20 SA* *14 204219 STE 20 OZ*	Application for a Zoning By-law Amendment and Site Plan Approval to permit redevelopment of the block with two residential condominium towers of 75 and 68 storeys, inclusive of a ten-storey mixed use podium comprised of retail, office, residential dwelling units and accessory uses.	LPAT appeal.
350 Queens Quay West *16 116138 STE 20 OZ*	Proposal for OPA and zoning by-law amendment related to a new 29-storey mixed use building in place of the existing three storey building at 370 Queens Quay West, northerly 21-storey additions to existing mixed-use buildings at 350 and 390 Queens Quay West.	Under review.
301 Front Street West *12 154597 STE 20 SA*	Site Plan Approval. Revision to existing site plan agreement for changes to the exterior elevations, site details including gate and fencing work.	Under review.
86 John Street *16 189275 STE 20 SA*	Site Plan application for an eight storey Retail and Eating Establishment building.	Under review.
30 Widmer Street *14 235284 STE 20 SA*	Site Plan Approval. To obtain site plan approval for the construction of a 51-storey mixed use condo building and an eight storey podium with retail uses on the ground floor and second floor. A total of 461 residential units are proposed and 198 below grade parking spaces are proposed.	Under review.
8 Widmer Street *16 118450 STE 20 OZ*	Application to rezone the subject lands for the construction of a 56-storey residential tower. The tower is located at the rear of the six existing townhouses that are listed heritage buildings. The proposal includes 583 residential units and 227 vehicular parking spaces in five underground parking levels.	Appeal received.
81 Peter Street *17 140518 STE 20 CD*	Draft Plan of Condominium for newly-constructed residential building: 630 units.	Under review.

Address File Number	Application Summary	Application Status
319 King Street West *13 144733 STE 20 OZ*	Zoning By-law Amendment. The redevelopment of the subject property with a 43-storey commercial building. The proposed building would include office, hotel and retail uses. Four levels of underground parking are proposed for 103 vehicular parking spaces.	Under review.
15 Mercer Street *17 211293 STE 20 SA* *15 135436 STE 20 OZ*	Site Plan Approval application and Zoning By-law Amendment to permit a mixed-used building consisting two 45-storey towers connected by a nine-storey base building. Commercial space, hotel space with 36 suites, and residential space comprising 660 dwelling units and six levels of underground parking are proposed.	Under review.
24 Mercer Street *15 212573 STE 20 SA*	Site Plan Approval. The proposed project is a seventeen storey 3,280 m^2, mixed-use commercial/live-work/residential building to replace an existing residential building.	Under review.
327 King Street West *10 182677 STE 20 OZ*	Zoning By-law Amendment. The redevelopment of the subject property with a 47-storey 304 unit condominium building comprises of a four storey podium, four level underground parking garage.	LPAT appeal.
357 King Street West *17 210511 STE 20 SA*	Site Plan application for a 42-storey building containing three levels of underground parking, retail at grade, and 324 residential units. There are 18 car share spaces, and one Type G loading space proposed.	Under review.
400 King Street West *17 190839 STE 20 OZ*	Zoning By-law Amendment to permit a 47-storey mixed-use building, with a total of 530 residential units and retail space located on the first two levels of the podium.	Under review.
401-409 King Street West *10 197695 STE 20 OZ*	Standard rezoning application for the construction of new 55-storey mixed-use building containing retail use on two floors with residential above. A total of 615 residential units are proposed with 431 parking spaces in a five level underground parking garage.	Under review.
57 Spadina Avenue *16 249867 STE 20 SA*	Site Plan Approval application for a new 36-storey mixed-use building with retail on the first and second floors, office uses on the third and fourth floors, and residential use on the fifth floor and to the top.	Under review.
49 Spadina Avenue *17 122573 STE 20 OZ*	Zoning By-law amendment to retain the existing six-storey heritage building on the western portion of the site and to develop a new, 20-storey tower on the eastern half of the site. The existing retail and commercial uses within the heritage building will be maintained and the proposed tower addition will contain retail uses at grade and office uses above. No vehicular parking is proposed.	Under review.
400 Front Street West *15 136961 STE 20 OZ*	Zoning By-law Amendment. Proposal to construct four mixed-use towers. Two towers of 58 and 60-storeys are proposed on the north parcel and two towers of 24 and 25-storeys are proposed on the south parcel. A total of	Under review.

Address File Number	Application Summary	Application Status
	2,236 residential units are proposed, as well as retail uses. The development would include 649 parking spaces in three levels of underground parking.	
433 Front Street West *17 164359 STE 20 OZ*	Official Plan Amendment (OPA). The proposal is to develop a rail corridor overbuild (deck) over the existing active rail corridor to accommodate development, while maintaining the rail activities. The ORCA Project proposes a mixed-use and open space development, consisting of eight buildings with a combined GFA of 368,100 m^2. The proposal includes the portion of the Rail Corridor bounded by Front Street West between Spadina Avenue and Bathurst Street; Blue Jays Way; Ice Boat Terrace; and Bathurst Street.	Under review.
440 Front Street West *17 245498 STE 20 SA* *17 245539 STE 20 SA* *17 245560 STE 20 SA* *17 245526 STE 20 SA*	Proposal for site plan approval related to the construction of a 40-storey residential building with a total of 613 residential units.	Under review.
489 King Street West *12 203376 STE 20 OZ*	Official Plan Amendment (OPA) and Rezoning to permit the redevelopment of the lands for a new 12-storey office building complete with ground floor related commercial uses. Included in the proposal is parking for 159 vehicles in a below grade parking facility.	Under review.
533 King Street West *16 159483 STE 20 OZ*	Revised Zoning Amendment application for residential, office and restaurant/retail uses in a single building framing a large publicly accessible open courtyard. The essential form includes four building "peaks" of which the tallest are 16 storeys (57.5 metres). Parking spaces (307) are proposed in a two-level underground parking garage. There is also a below-grade commercial floor, a partial commercial mezzanine floor and two and a half levels of commercial/office space above grade with 514 residential units above.	Under review.
473 Wellington Street West *16 261191 STE 20 OZ*	The proposed Zoning By-law amendment would permit a 15-storey office building. The building would consist of a five-storey element which would extend to the front property line and a 15-storey building which would extend to the rear lot line.	LPAT appeal.
488 Wellington Street West 16 270154 STE 20 OZ	Zoning By-law Amendment. To permit a 16-storey office building with office space and 31 parking spaces provided at grade within a stacked parking mechanism accessed via a laneway to the west of the building.	Under review.

Address File Number	Application Summary	Application Status
489 Wellington Street West 16 114472 STE 20 OZ	Zoning By-law Amendment. To permit a 15-storey mixed use building with 131 residential units and retail space with one level of underground parking.	Under review.
504 Wellington Street West 16 270147 STE 20 OZ	Zoning By-law Amendment application for a 15-storey building with retail and service commercial uses on the ground floor and 12 vehicle parking spaces.	Under review.
582 King Street West 17 215108 STE 20 SA 17 215103 STE 20 OZ	Zoning By-law Amendment, Site Plan Approval. Proposal for rezoning to construct eight additional stories of non-residential floor area.	Under review.
663 King Street West 16 270239 STE 20 OZ	Proposal for rezoning related to a 19 storey mixed use building with three levels of retail and two levels of underground parking, a total of 247 residential units.	Under review.
65 Grand Magazine Street *16 248152 STE 19 SA* *14 264174 STE 19 OZ*	Site Plan Approval, OPA, Zoning By-law Amendment. A Site Plan control application to permit the development of a 24-storey (79 metre, inclusive of mechanicals) residential building with 459 units, 366 vehicle parking spaces and 460 bike parking spaces.	Under review.
10 Ordnance Street *12 282863 STE 19 SA* *16 182989 STE 19 SA*	Site Plan Approval application for a mixed-use development containing: 579 dwelling units. This is Block 3 of the Ordnance Triangle Development.	Under review.
28 Bathurst Street *12 297477 STE 19 OZ*	Official Plan Amendment (OPA) and rezoning to permit the development of two new 16-storey residential buildings and one new 19-storey building with retail smf commercial uses on the lower two floors and residential units on the upper floors. A new east-west public road and new public park are also being proposed.	Under review.
90 Niagara Street *17 205309 STE 19 CD*	Draft Plan of Condominium Approval for a newly constructed residential building: 42 dwelling units, 33 car parking spaces, three motorcycle parking spaces.	Under review.
689 King Street West *15 260024 STE 19 SA*	Site Plan Approval. Retail development located just west of Bathurst Street along King Street, and consists of two levels of retail above grade, a restaurant and north facing terrace at the third level, and one level of retail below grade. The new development proposes to maintain the existing zero lot line setbacks on all sides.	Under review.
751 King Street West *13 248113 STE 19 CD*	Condominium Approval. Application for standard condominium which will be comprised of 137 parking units within an underground garage.	Under review.

3.8.7.2 Bloor-Lansdowne GO Station

The City of Toronto OP was consolidated and approved by the LPAT in June 2015. The OP addresses all elements of effective, sustainable and successful city-building, while also addressing growth to the year 2031 (City of Toronto, 2015). The GO Station will support the City of Toronto's direction to accommodate future growth, while also providing infrastructure to promote active transportation. The City of Toronto OP delineates land use designations within the overall Bloor-Lansdowne study area on OP Area F (Map 17), and OP Area E (Map 18). Most of the south study area is designated as "Neighbourhoods", with small areas identified as other land uses including "Apartment Neighbourhoods", "Mixed Use Areas", "Parks and Open Space Areas", "Employment Areas". and "Utility Corridors". The north study area is mostly designated as "Neighbourhoods", with small areas identified as other land uses including "Employment Areas", "Regeneration Areas", "Mixed-Use Areas", "Apartment Neighbourhoods", "Parks and Open Spaces" and "Utility Corridors". There are no Heritage Conservation Districts in either the south or north study areas. Section 2.2 of the City of Toronto OP identifies "Avenues", "Employment Areas" and "Green Space Areas" urban structure designations within the Bloor-Lansdowne study area (City of Toronto, 2017b).

The City of Toronto Zoning By-Law No. 438-86 and 569-2013 implements many of the policies of the City's OP, which focuses growth within the urban part of the City; promotes increased transit ridership; emphasizes good urban design; preserves environmental integrity; and will achieve compact mixed-use communities. Lands within the Bloor-Lansdowne GO Station footprint are covered under the City of Toronto Zoning By-law 569-2013. The City of Toronto Zoning By-law 569-2013 was enacted by Toronto City Council on May 9, 2013. Some of the designations within the Former City of Toronto Bylaw (No.438-86) are still applicable to areas within the Bloor-Lansdowne GO Station study area, which have not yet been harmonized. There is a need to consider both the current City of Toronto By-law 569-2013, as well as By-Law 438-86. Properties in the Bloor-Lansdowne study area are zoned as open space recreation, open space, employment industrial, residential, utility and transportation, commercial residential, park, mixed-use and industrial (City of Toronto, 2013).

As described in Section 3.8.4 of this EPR Addendum, a small portion of the north study area is located within the Davenport Village Secondary Plan. The Secondary Plan will be developed as an extension of the residential neighbourhood east of the Earlscourt Bridge site and may contain up to 1,960 dwelling units. The Secondary Plan incorporates a mix of residential units, including townhouses and apartments. As noted in Table 3-8, there is no Secondary Plan or Growth Area within the Bloor-Lansdowne south study area.

The City of Toronto Cycling Network Ten Year Plan was approved by City Council in June 2016. It outlines existing rail lines, freeways, major roads, and green spaces, existing and planned bike lanes/cycle tracks, trails/boulevard trails, quiet street routes, and planned tunnels and bridges, as well as major corridor studies (City of Toronto, 2016a). Several infrastructure projects within the Bloor-Lansdowne study area are planned.

The City of Toronto Planning Services website was consulted to confirm the status development applications within the Bloor-Lansdowne study area, which are current as of May 25, 2018. There are 18 development applications within the Bloor-Lansdowne study area; 11 in the south study area and seven in the north study area (City of Toronto, 2017c). These are presented in Table 3-15.

Table 3-15: Development Applications within the Bloor-Lansdowne Study Area

Address File Number	Application Summary	Application Status
South Study Area		
2376 Dundas Street West Site Plan Approval / Rezoning *Number 11 317575 STE 14 OZ*	Proposal for Site Plan Approval for a mid-rise building and a 23-storey tower adjacent the rail corridor, and pick-up/drop off facility to serve the Metrolinx/GO Union-Pearson Express	Site Plan Approval under review, Rezoning appealed
2280 Dundas Street West Official Plan Amendment *Number 18 149172 STE 14 OZ*	Official Plan Amendment to the southeast corner of Bloor Street West and Dundas Street West to facilitate a proposed mixed-use development containing commercial, retail, employment, residential and institutional uses.	Under Review
18 Columbus Avenue *Zoning By-law Application File Number 02 035393 SHY 13 OZ*	Rezoning	Open
30 Columbus Avenue *Rezoning Number 02 035392 SHY 14 OZ*	Rezoning	Open
383 Sorauren Avenue *Condominium Approval, Site Plan Approval, Rezoning Number 13 206017 STE 14 SA and 16 147481 STE 14 CD12 264111 STE 14 OZ*	Condominium Approval, Site Plan Approval, Rezoning, for a ten-storey condominium with 143 residential units	Draft Plan Approved September 2016
35 Wabash Avenue *Site Plan Approval / Rezoning Number 195121 STE 14 OZ*	Site Plan Approval/Rezoning	Rezoning Approved, Site Plan Approval Under Review
243 Perth Avenue *Condominium Approval, Minor Variance, Official Plan Amendment (OPA)*	Draft Plan of a condominium for a converted place of worship, a four-storey addition with 43 dwelling units and parking	Condominium Approved, Site Plan Approved, Minor Variance closed, OPA & Rezoning closed.

Address File Number	Application Summary	Application Status
and Rezoning, Site Plan Approval Number 11 296294 STE 18 OZ		
26 Ernest Avenue *Site Plan Approval / Rezoning Number 14 169082 STE 18 SA and 14 169077 STE 18 OZ*	Site Plan Control application for three blocks of three-storey townhouses with 70 dwelling units and parking spaces	Site Plan Approval under review, Rezoning approved
170 Perth Avenue *Site Plan Approval Number 17 181102 STE 18 SA*	Site Plan Control for three-storey mixed-use building	Under review
1439 Bloor Street West *Site Plan Approval Number 10 104718 STE 18 SA*	Proposal for Site Plan Approval for a 14-storey mixed-use building with retail	Under review
158 Sterling Road *Site Plan Approval, Rezoning, Application for Consent, Minor Variance, Subdivision Approval, OPA and Rezoning Numbers 11 228729 STE 18 OZ, 12 226212 STE 18 SB, 17 164663 STE 18 SA and 17 164667 STE 18 SA*	Employment land conversion of a former industrial site to a mixed-use development with 52,000 square metres of non-residential gross floor area and 50,000 square metres of residential gross floor area.	Official Plan and Rezoning Amendments approved at OMB, two Site Plan Approval applications on hold, two Applications for Consent closed, Minor Variance closed, Draft Plan of Subdivision under OMB/LPAT appeal
138 St Helens Avenue *Minor Variance, Rezoning, Site Plan Approval Number 12 141001 STE 18 OZ*	Site Plan Approval for nine-storey mixed-use building	Minor Variance closed, Rezoning Approved, Site Plan Approval under review

Address File Number	Application Summary	Application Status
North Study Area		
1450 St. Clair Avenue West *13 158054 WET 17 SA*	Site Plan Application. Proposed third storey addition to an existing two-storey mausoleum, with no alterations to the exterior walls of the existing mausoleum.	Site plan approved October 2014.
1800 Davenport Road *13 173771 WET 17 SA*	Site Plan Approval. Proposed single-storey industrial units.	Under review.
1859 Davenport Road *Number 14 113291 WET SA*	Site Plan Approval. Proposed reconstruction of the existing first and second storey with the addition of a third, and a three-storey extension, to expand retail space and create four residential units.	Under review.
940 Lansdowne Avenue *03 176582 WET 17 OZ*	Proposed OPA to the Davenport Village Secondary Plan and a Zoning By-Law Amendment to permit the construction of three residential apartment buildings with 24, 28, and 32 storeys on top of a podium and four blocks of three-storey townhouses.	Some applications approved (2015 and 2017), some under review.
386-394 Symington Avenue *15 238678 WET 17 OZ*	Site Plan Approval/OPA/Rezoning. Proposed development of a mixed-use development.	OPA and Rezoning appealed, Site Plan Application under review.
830 Lansdowne Avenue *10 265956 STE 18 OZ*	Condominium Approval/Minor Variance/Site Plan Approval/OPA/Rezoning. Draft Plan of Standard Condominium for a newly-constructed mixed-use building with 576 dwelling units.	Condominium Approval under review, Minor Variance closed, Site Plan Approval NOAC issued, OPA and Rezoning Approved.
299 Campbell Avenue *12 236801 STE 18 OZ*	Employment Land Conversion, Site Plan Approval for the construction of 12 mixed-use buildings with 12 storeys providing 233 residential units, with a public library and retail space on lower storeys.	Under review.

3.8.7.3 Kirby GO Station

The York Region OP was adopted in 2010 and modified in 2016. The York Region OP addresses growth management, and guides economic, environmental, and community building. The York Region OP policy objectives are a sustainable natural environment, healthy communities, and economic vitality.

The OP sets out population and employment growth targets to the year 2031, and provides direction on city building in regional centres and corridors linked by rapid transit, on intensification, on new community areas, on the preservation of rural and agricultural areas, and on servicing the population (York Region, 2016b).

The VOP 2010 was adopted by Council in September 2010. The OP was endorsed by York Region in June 2012 and consolidated in 2017. There was an appeal to the OMB, followed by the receipt of partial approval. The OP addresses all elements of effective, sustainable and successful city-building, while also addressing growth to the year 2031 (City of Vaughan, 2017b). The VOP 2010 designated land uses within the Kirby study area as mostly “Agricultural” in the northwest quadrant, as “Agricultural” and “Oak Ridges Moraine Natural Linkage” in the northeast quadrant, as “Low-Rise Residential”, “Low-Rise Mixed Use” and “Parks” in the southeast quadrant, and as “New Community Areas” and “Natural Areas” in the southwest quadrant (City of Vaughan, 2017b). There are no Heritage Conservation Districts in the Kirby study area.

The City of Vaughan Zoning By-law 1-88 was enacted by the Town of Vaughan Council on September 19, 1988. Land under the Kirby GO Station footprint is zoned as agricultural land (City of Vaughan, 2015).

There are no identified major transit networks within the Kirby study area, with the exception of the Kirby GO Station (City of Vaughan, 2012). The City of Vaughan is in the process of developing the NVNCTMP to create a sustainable transportation network considering all forms of transportation until 2031 (City of Vaughan, 2017a).

The City of Vaughan is located within York Region. The York Region TMP was completed in 2016 and identifies mobility needs up to the year 2041. A Proposed 10 Year Cycling Network (2031), as well as a Proposed 2041 Cycling Network are included as part of the TMP. The Proposed 10 Year Cycling Network includes dedicated and separated cycling lanes along major roads to complement existing ones. These extend along major roads within the City of Vaughan, City of Markham and Town of Richmond Hill. The Proposed 2041 Cycling Network completes the 10 Year Network and proposes separated cycling facilities along Keele Street (north and south of Kirby Road), as well as proposing that Kirby Road be designated as a “Local Cycling Route of Regional Significance” between Jane Street and Keele Street (York Region, 2016a).

The City of Vaughan is currently updating its city-wide Pedestrian and Bicycle Master Plan from 2007. Within the Kirby study area, both Kirby Road and Keele Street are identified as long-term routes (2017-2026). Both of the routes along Kirby Road and Keele Street are identified as Community Paved Shoulder Bikeway. A proposed Super Trail linking communities through Vaughan will also link the City’s trail system to transit systems and adjacent municipalities. The trail will be approximately 100 kilometres (km) long (40 percent already exists), and a section

of the trail will pass through Block 27 along the TransCanada Pipeline (J. MacKenzie, personal communication, October 13, 2017) (City of Vaughan, 2017c).. This is a Community Multi-use Recreational Pathway, identified to cross Keele Street in an east-west direction, south of the GO Station footprint parallel to Kirby Road. This pathway appears to connect from Bathurst Street in the east, westerly towards the Kleinburg Heritage Area. This pathway is identified as a "pipeline trail" following the TransCanada Canadian Mainline (City of Vaughan, 2017d).

The planned NMRP is within the study area. This park is planned to include two premium artificial field soccer pitches, change room and ancillary services building, access road, parking and trails to be completed in 2018, and may be expanded to include additional land and facilities. The NMRP expansion is currently under review by the City of Vaughan (City of Vaughan, 2017e).

The City of Vaughan's Planning Services website was consulted to confirm the status of current development applications within the Kirby study area, which are current as of May 8, 2018. There are three development applications within the Kirby GO Station area. These are presented in Table 3-16.

Table 3-16: Development Applications within the Kirby Study Area

Address File Number	Application Summary	Application Status
Part Lot 31, Concession 4 *DA.17.030*	A Site Plan Application for an indoor tennis court along with accessory support spaces and office uses. Proposed by K&K Holdings.	Proposed (in progress)
11610 Keele Street *DA.18.018*	A Site Plan Approval for exterior renovation of Tim Hortons. Proposed by K&K Holdings.	Proposed (in progress)
Parts of Lots 31 and 32, Concession 4 (11650 Keele Street) *Z.11.035*	A zoning by-law to expand agricultural related uses on the site. Approved by the TRCA March 16, 2016. Proposed by Joseph Kreiner & Bren-Coll Holdings Inc.	Proposed (in progress)

3.8.7.4 Mulock GO Station

The Town of Newmarket OP was consolidated and approved by the Town of Newmarket Council in October 2006. The OP addresses all elements of effective, sustainable and successful city-building, while also addressing growth to the year 2026 (Town of Newmarket, 2016). The Town of Newmarket OP delineates land use designations within the Mulock study area (Town of Newmarket, 2016). The proposed Mulock study area is located within the following designated land uses: "Business Park", "Parks and Open Space" "Stable Residential, "Natural Heritage System" ("Flood Plain") and "Commercial".

Lands within the proposed Mulock GO Station footprint area are covered by the Town of Newmarket Zoning By-law 2010-40. The Mulock GO Station footprint is located within the employment and the commercial zones (Town of Newmarket, 2017).

The Town of Newmarket OP also proposes to significantly increase its cycling paths, as well as its trails. The cycling paths are planned throughout the Town of Newmarket, including on local roads. The trails are planned within parks and open spaces, adjacent to watercourses and through conservation areas (Town of Newmarket, 2016).

The Town of Newmarket is part of York Region. The York Region TMP was completed in 2016 and identifies mobility needs up to the year 2041. A Proposed 10 Year Cycling Network (2031), as well as a Proposed 2041 Cycling Network are included as part of the TMP. The Proposed 10 Year Cycling Network includes dedicated and separated cycling lanes along major roads to complement existing ones. These extend along major roads within the City of Vaughan, City of Markham and Town of Richmond Hill. The Proposed 2041 Cycling Network completes the 10 Year Network and proposes dedicated cycling facilities along Bayview Avenue (north of Mulock Drive) and along Mulock Drive (east of Bayview Avenue). It also includes separated cycling facilities and a conceptual region-wide trail system along the East Holland River (York Region, 2016a).

The Town of Newmarket Planning Services department was consulted to confirm the status of current development applications within the Mulock study area. There are four active development applications within the Mulock study area. These are presented in Table 3-17.

Table 3-17: Development Applications within the Mulock Study Area

Address File Number	Application Summary	Application Status
Pickering College *D11-NP1612*	A Site Plan Approval for a new academic building.	Approved in principle.
507 Mulock Drive *D11-NP1605, D-14NP1605*	A Zoning By-Law Amendment and a Site Plan Approval for a two-storey medical office.	Approved.
575 Penrose Street *D11-NP1518*	A Site Plan Approval for a parking lot expansion.	Approved in principle.
Western Terminus of Silken Laumann Drive, west of the hydro corridor *D7-NP1316, D9-NP1316, D12-NP1316, D14-NP1316.*	An OPA, a Zoning By-law Amendment, a Draft Plan of Subdivision and a Plan of Condominium.	OPA referred to LPAT. Zoning By-law referred to LPAT. Draft Plan of Subdivision Approved. Plan of Condominium Pending.

3.8.7.5 Innisfil GO Station

There are no transit routes or stops within the study area. However, the Town and Uber Technologies Inc. (Uber) are currently working collaboratively to provide reliable, affordable, on-demand transit to service all residents of Innisfil. Uber is municipally subsidized by the Town of Innisfil, however classified as microtransit, given the different type of vehicle as compared to a typical local transit vehicle. This is the first ridesharing and transit partnership in Canada. Uber and the Town of Innisfil have identified a set fee for certain rides throughout the Town, which range in price from three to five dollars. The municipal program has been underway since May 2017 (Town of Innisfil, 2017a).

In May 2018, the Town of Innisfil adopted the TMP Update to plan for growth to the year 2041. Given the anticipated population and employment growth, there are issues, challenges and opportunities in planning for the future. The recommended strategy includes key roadway connections, the implementation of active transportation improvements, parking standard reviews, dockless bike share services, as well as a plan for fixed route transit to build on the existing demand-response transit service already in use (Town of Innisfil, 2018).

There are no existing sidewalks or official trails within the study area, except those noted in Table 3-39. Proposed active transportation infrastructure as outlined in the TMP Update (May 2018) include a Secondary Trail to be implemented in the long-term along the east side of the Barrie rail corridor, and a multi-use trail is recommended along 6th Line in the short-term (Town of Innisfil, 2018).

The County of Simcoe Transit is currently working towards the initial launch of Route 1 of the Linx, which is a conventional public transit system that will link major urban hubs with local transit services throughout the County of Simcoe. Future Routes will launch in the coming years, however there are no routes planned within the study area (County of Simcoe, 2018).

The County of Simcoe TMP outlines recommended designs for cycling routes and proposed policies for trail linkage systems County-wide, and the County is planning to support the development of active transportation (EarthTech, 2008). There are no planned cycling routes within the study area.

County of Simcoe Official Plan

The County of Simcoe OP was approved by the OMB in December 2016. The OP was prepared under the *Planning Act* (PA), 1990, and provides a policy context for land use planning with regards to the economic, social, and environmental impacts of land use and development decisions (County of Simcoe, 2016). The OP applies to the 16 Towns and Townships which constitute the County of Simcoe (including the Town of Innisfil) and provides a policy basis for exercising the approval authorities for local municipal OPs and amendments, and applications for subdivision of land. As such, the Town's OP and Comprehensive Zoning By-law 080-13 must be in conformity with the County OP (County of Simcoe, 2016). The OP is designed to assist in growth management in the County of Simcoe, which is expected to experience continued growth in population and urban development over the next twenty years in accordance with the Growth Plan as amended.

Section 3.3.15 of the County OP (2016) generally prohibits development within natural heritage features and areas with the goal of, where possible, restoring and maintaining the connectivity and linkages between natural heritage features and areas. The County recognizes the ecological and economic importance of the preservation of these features and other natural heritage features and areas within the County, which is reflected within the Greenlands section (Section 3.8) and other policies of the County OP. Specifically, Section 3.8 outlines the protection of lands within the County mapped as "Greenlands" (i.e., the natural heritage system (NHS) of the County) as per Schedule 5.1 – Land Use Designations (2016). The study area is located within the "Greenlands" designation but the station footprint is not.

The County OP also includes public transit-supportive policies and policies specific to the expansion of the Barrie rail corridor indicate the importance of rail as a mode of commuter transportation. Specifically, Section 3.3.24 of the Simcoe County OP (2016) states:

"the County acknowledges the importance of rail infrastructure and recognizes its critical role in long-term economic growth and the efficient and effective movement of goods and people. The County shall ensure the continued viability and ultimate capacity of the rail corridors and yards are protected."

Chapter 4 of the Simcoe County TMP (Earth Tech Canada Inc., 2008), states a strategic direction is to work with Metrolinx to support extension of additional rail passenger services into Simcoe County. This correlates with the County OP (2016), which also specifies concern with potential effects of rail facilities on "sensitive land uses". Specifically, Section 3.3.24 the Simcoe County OP (2016) states:

"All proposed residential or other sensitive land use development within 300 m of a railway ROW will undertake noise studies… within 75 m of a railway ROW will be required to undertake vibration studies… All proposed development adjacent to railways shall ensure that appropriate safety measures such as setbacks, berms and security fencing are provided… Where applicable, the County will ensure that sightline requirements of Transport Canada and the railways are addressed… Implementation and maintenance of any required rail noise, vibration and safety impact mitigation measures, along with any required notices on title such as warning clauses and/or environmental easements, will be secured through appropriate legal mechanisms, to the satisfaction of the County or the local municipality, whichever is appropriate, and the appropriate railway."

The County OP includes public transit-supportive policies and policies specific to the expansion of the Barrie rail corridor, which indicate the importance placed on rail as a mode of commuter transportation. In addition, the County OP (2016) also recognizes the importance of limiting incompatible development adjacent to rail facilities, such as the existing Barrie rail corridor and the proposed Innisfil GO Station.

The County of Simcoe OP designates Alcona (within the Innisfil GO Station study area) in the Town of Innisfil as a Primary Settlement Area, which is planned to develop as a complete community, as described (County of Simcoe, 2016):

> "Municipalities with primary settlement areas will, in their official plans, identify primary settlement areas, identify and plan for intensification areas within primary settlement areas and ensure the development of high quality urban form and public open spaces within primary settlement areas through site design and urban design standards that create attractive and vibrant places that support walking and cycling for everyday activities and are transit-supportive." (County of Simcoe, 2016).

Town of Innisfil Official Plan

The Town of Innisfil OP was adopted by Council in July 2006 and approved by the OMB in 2009, 2010, and 2011. The OP addresses all elements of effective, sustainable and successful development, while also addressing growth to the year 2026 (Town of Innisfil, 2018). Schedule B of the Town of Innisfil OP delineates land use designations within its jurisdiction, including

those applicable to the Innisfil study area. The lands within the Innisfil study area are mapped as “Rural Area” in all four quadrants with pockets of “Natural Environmental Area” in the northern and southeast parts. The Alcona Urban Settlement Area is located in the northeast quadrant of the Innisfil study area, and contains “Residential Low Density 1” and “Residential Low Density 2” land use areas within the Innisfil study area. The County of Simcoe TMP outlines recommended designs for cycling routes and proposed policies for trail linkage systems County-wide, and the County is planning to support the development of active transportation (EarthTech, 2008).

The Town of Innisfil Comprehensive Zoning By-law 080-13 (adopted by Council in July 2013, and containing amendments up to April 2017) controls the use of land within the municipality (Town of Innisfil, 2017b). Lands under the Innisfil GO Station footprint area are designated as agricultural general (Town of Innisfil, 2017c).

Official Plan Amendment 8

The “Sleeping Lion” area, part of the Alcona South Secondary Plan was included in the existing settlement boundary of Alcona by an OMB decision in September 2011. Official Plan Amendment 8 (OPA 8) refers to the Alcona South Secondary Plan (Sleeping Lion) which includes 95 ha of lands, some of which are partly within the study area. The OPA 8 was adopted by the Town of Innisfil in June 2013 and modified and approved by the County of Simcoe in August 2013 (Bousfields Inc., 2013).

The Town of Innisfil’s Planning Services department was consulted and there are no current development applications within the study area (July 18, 2018).

3.9 Air Quality

3.9.1 Methodology

An AQIA was completed for each GO Station. A copy of each AQIA is provided in Appendix G of Volume 2 through Volume 6 of this EPR Addendum. This section of the EPR Addendum provides a summary of the existing air quality conditions within the GO Station study areas. The objectives of the AQIAs were:

- To predict the concentrations of the selected contaminants resulting from rail traffic along the Barrie rail corridor and vehicles accessing the GO Stations for the three scenarios:
  - Current conditions (2017);
  - Future with electrification, but does not include the GO Stations (2028) (Future No-Build); and
  - Future with electrification and inclusion of the GO Stations (2028) (Future Build).
- To predict the combined effect of the Project, surrounding sources and ambient background concentrations at representative worst-case receptors; and
- To use these predictions to assess potential effects of the Project according to applicable guidelines.

To satisfy the study objectives, existing and planned sensitive and critical receptors within all study areas for each GO Station were confirmed and documented. The predicted air quality

effects associated with the development of each GO Station have been assessed and compared to threshold limits. A sensitive receptor for the purposes of the AQIAs is defined by the Ministry of Transportation of Ontario (MTO) Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects (MTO, 2012) as a residential dwelling while a critical receptor includes a:

- Child care facility;
- Health care facility;
- Senior citizen's residence;
- Long-term care facility; or
- School.

In cases where one of these scenarios lead to an excessive concentration of one of the selected pollutants, mitigation measures will be recommended to reduce the severity of potential effects on air quality.

For the three scenarios, rail traffic, and as applicable, parking traffic, scheduled bus traffic, and as applicable, the size of PPUDO areas as well as access roads and road modifications were used to determine effects of the GO Stations on sensitive receptors within all study areas. The modelled concentrations due to GO Transit operations were added to background sources and the resulting sums were compared to the most stringent air quality threshold in order to evaluate the potential for adverse effects. The Contaminants of Concern (COCs) that were assessed in the AQIAs included:

- Particulate matter less than 2.5 micrometres (µm) ($PM_{2.5}$);
- Volatile organic compounds (VOCs): acetaldehyde, acrolein, benzene, 1,3-butadiene, and formaldehyde;
- Polycyclic aromatic hydrocarbons (PAHs): benzo(a)pyrene (B(a)P);
- Nitrogen dioxide (NO_2): nitrogen oxides (NO_X) correction using available ozone (O_3) calculations for conversion of nitric oxide (NO) to NO_2;
- Carbon monoxide (CO); and
- Carbon dioxide equivalents (CO_{2eq}).

Qualitative assessments were undertaken for:

- Particulate matter less than 10 micrometre (µm) (PM_{10}); and
- Total Suspended Particulate (TSP).

All the dispersion models completed provided hourly results. Where the criterion was on an hourly basis, the maximum hourly result was reported. If the criterion was on a daily (24-hour) basis, the maximum 24-hour concentration result was reported. The annual results were the average of the hourly values for the year. The results were separated by contaminant and the following parameters are presented in the results tables:

- Receptor ID;
- Address (Point of Impingement (POI));
- Averaging Period;
- Scenario;
- The 90th percentile background value (from the MOECC and National Air Pollution Surveillance (NAPS) air quality monitoring stations). This value is summed with the modelled concentration to result in the maximum cumulative predicted concentration;
- Criterion (applicable limit value);
- The maximum cumulative concentration predicted for the most impacted receptor (net impact);
- The minimum cumulative concentration predicted;
- The median cumulative concentration predicted;
- The mean cumulative concentration predicted;
- The 90th percentile cumulative concentration predicted;
- The maximum cumulative percentage of criterion; and
- The 90th percentile cumulative percentage of criterion.

Receptor locations for the GO Stations are shown in Figure 3-14, Figure 3-15, Figure 3-16, Figure 3-17 and Figure 3-18.

3.9.2 Existing Conditions

Existing conditions from the dispersion modelling are shown in Table 3-18 (CO), Table 3-19 (NO_2), Table 3-20 ($PM_{2.5}$), Table 3-21 (benzene), Table 3-22 (1,3-butadiene), Table 3-23 (formaldehyde), Table 3-24 (acetaldehyde), Table 3-25 (acrolein) and Table 3-26 (B(a)P).

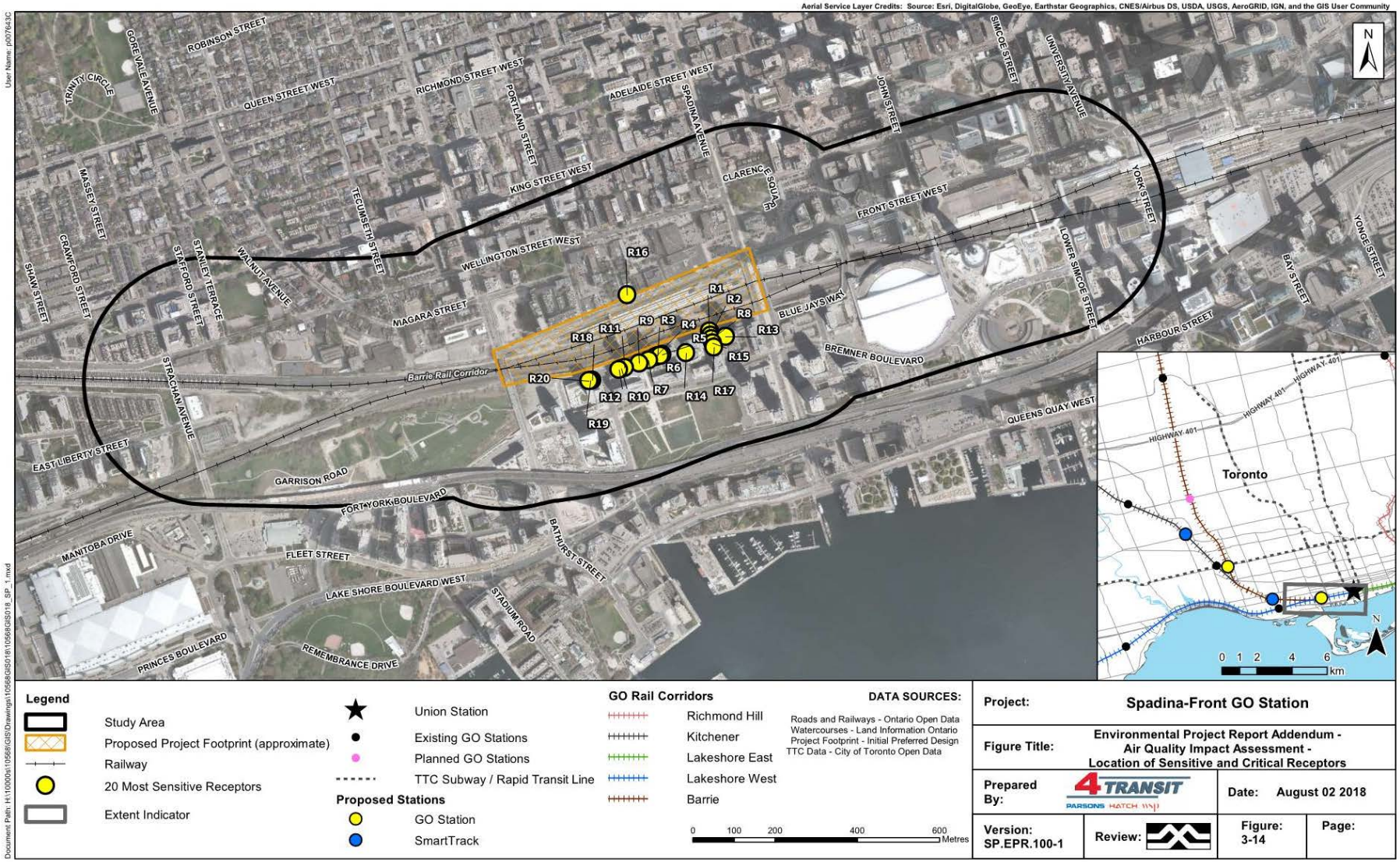


Figure 3-14: Spadina-Front GO Station – Location of Sensitive and Critical Receptors

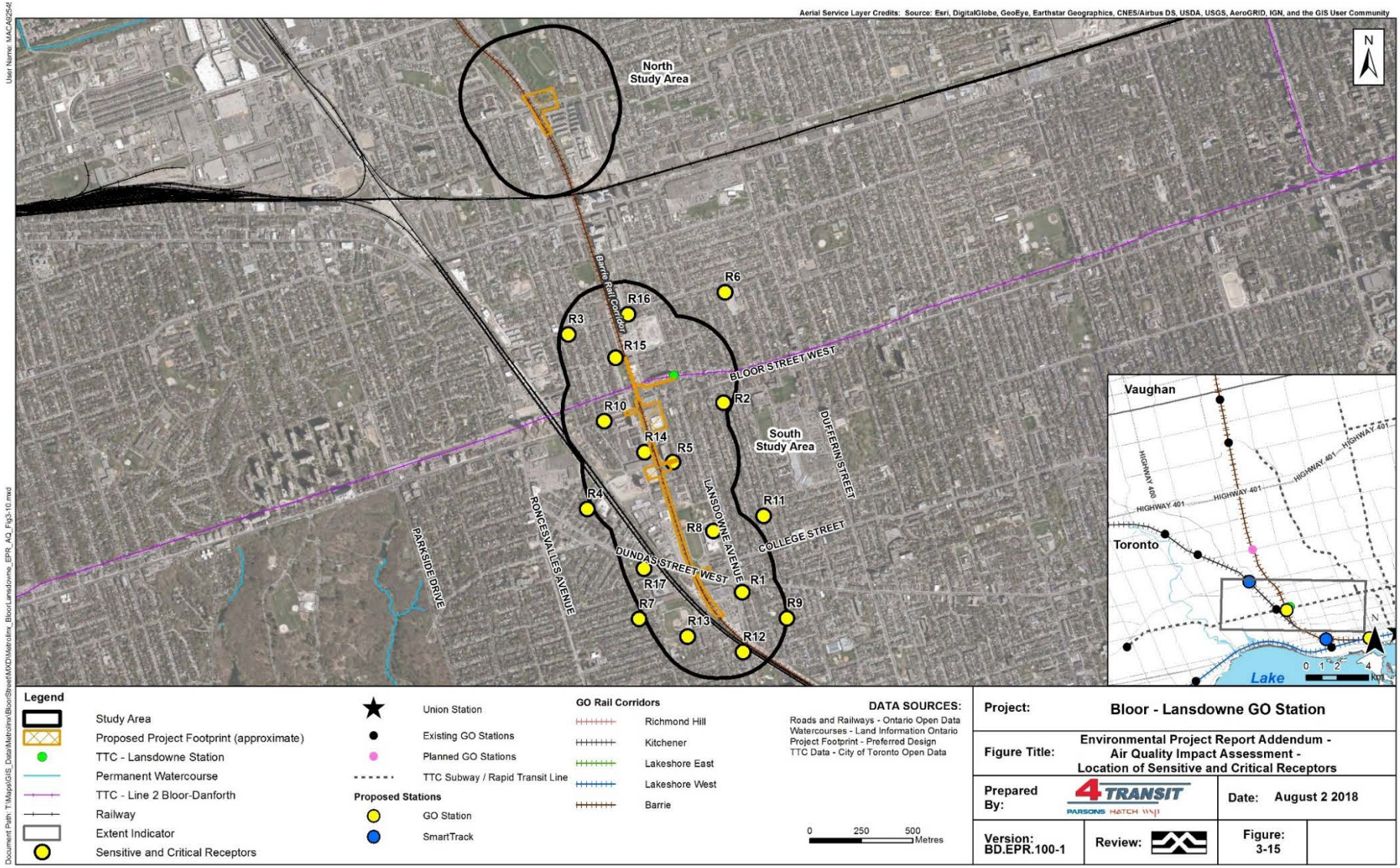


Figure 3-15: Bloor-Lansdowne GO Station – Location of Sensitive and Critical Receptors

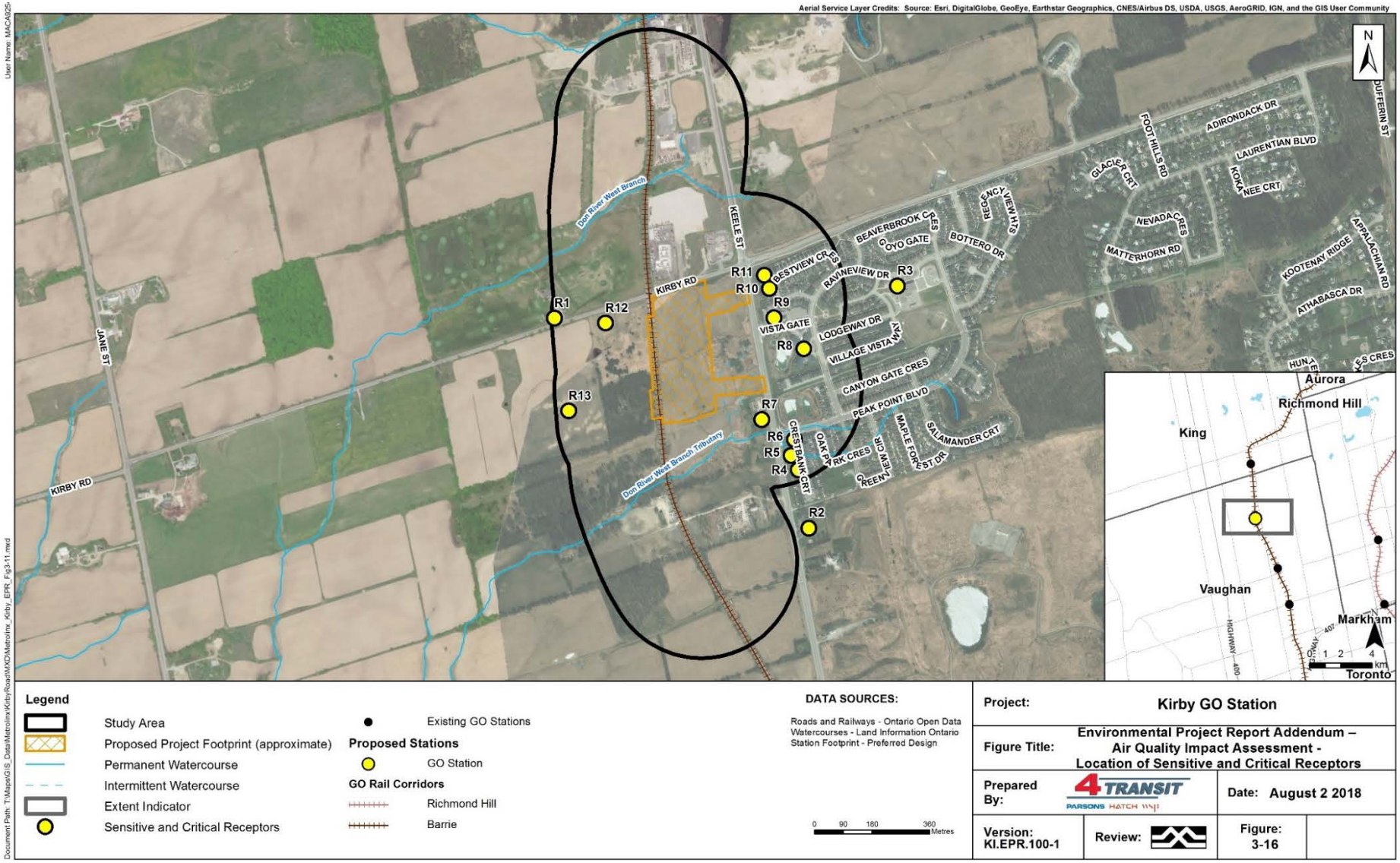


Figure 3-16: Kirby GO Station – Location of Sensitive and Critical Receptors

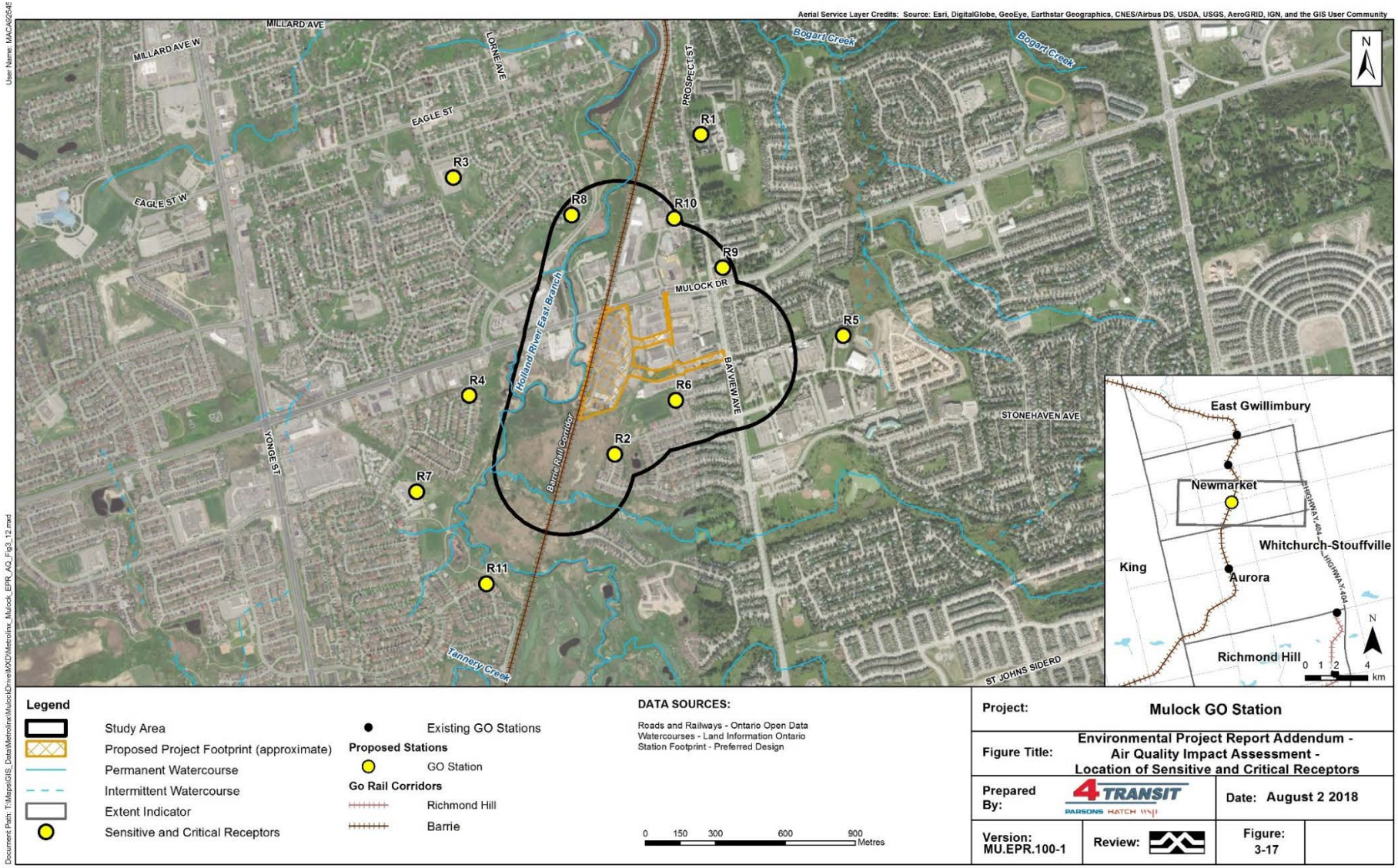


Figure 3-17: Mulock GO Station – Location of Sensitive and Critical Receptors

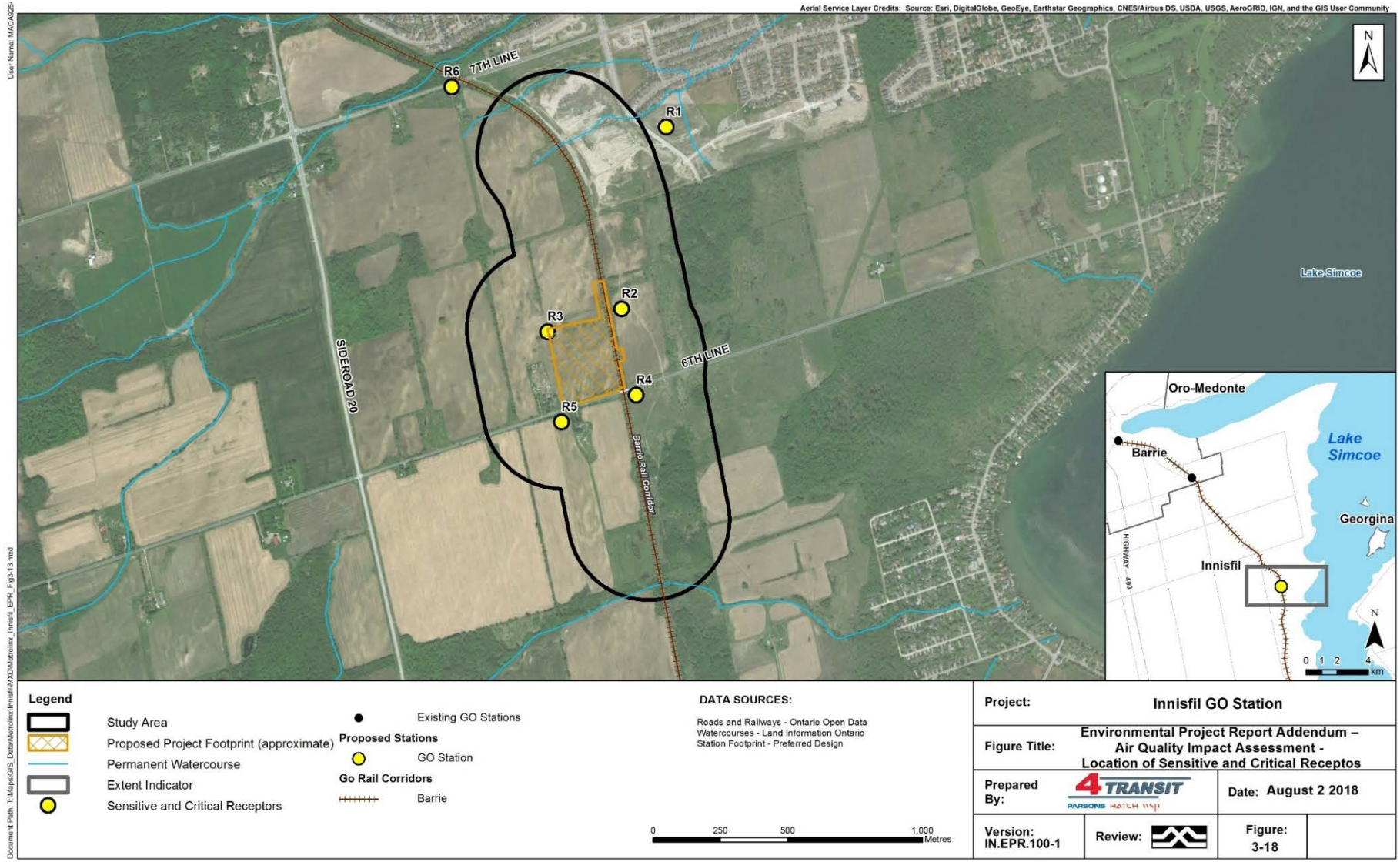


Figure 3-18: Innisfil GO Station – Location of Sensitive and Critical Receptors

Table 3-18: Existing Conditions for the Most Impacted Sensitive Receptors – Carbon Monoxide

Receptor ID	Address	Averaging Period	Criterion (µg/m^3)	Maximum cumulative concentration (µg/m^3)	Median cumulative concentration (µg/m^3)	Minimum cumulative concentration (µg/m^3)	Maximum cumulative % of criterion (%)
Spadina-Front GO Station							
R1	26 Telegram Mews, Toronto	1-HR	36,200	441	441	441	1.2
		8-HR	15,700	424	424	424	2.7
Bloor-Lansdowne GO Station							
R12	2/4 Rideau Avenue, Toronto	1-HR	36,200	480	460	457	1.3
		8-HR	15,700	460	444	440	2.9
Kirby GO Station							
R12	Future Development	1-HR	36,200	461	457	457	1.3
		8-HR	15,700	440	440	440	2.8
Mulock GO Station							
R6	432 Sydor Court	1-HR	36,200	457	457	457	1.3
		8-HR	15,700	440	440	440	2.8
Innisfil GO Station							
R4	Future residential development	1-HR	36,200	460	457	457	1.3
R3	Future residential development	1-HR	36,200	458	457	457	1.3
R3	Future residential development	8-HR	15,700	440	440	440	2.8

Table 3-19: Existing Conditions for the Most Impacted Sensitive Receptors – Nitrogen Dioxide

Receptor ID	Address	Averaging Period	Criterion (µg/m³)	Maximum cumulative concentration (µg/m³)	Median cumulative concentration (µg/m³)	Minimum cumulative concentration (µg/m³)	Maximum cumulative % of criterion (%)
Spadina-Front GO Station							
R1	26 Telegram Mews	1-HR	400	51.5	49.2	49.1	12.9
R1	26 Telegram Mews	24-HR	200	41.6	41.1	40.9	20.8
R1	26 Telegram Mews	ANNUAL	-	27.90	-	-	-
Bloor-Lansdowne GO Station							
R12	2/4 Rideau Ave, Toronto	1-HR	400	110.8	54.8	50.9	27.7
R12	2/4 Rideau Ave, Toronto	24-HR	200	61.7	48.0	43.5	30.8
R12	2/4 Rideau Ave, Toronto	ANNUAL	60	33.7	-	33.1	56.2
Kirby GO Station							
R12	Future Development	1-HR	400	106.9	30.4	30.4	26.7
R12	Future Development	24-HR	200	31.2	26.6	26.5	15.6
R12	Future Development	ANNUAL	60	14.3	-	14.2	23.9
Mulock GO Station							
R6	432 Sydor Court	1-HR	400	32.5	30.4	30.4	8.1
R6	432 Sydor Court	24-HR	200	27.0	26.6	26.5	13.5
R6	432 Sydor Court	ANNUAL	60	14.1	-	14.1	23.5
Innisfil GO Station							
R4	Future residential development	1-HR	400	99.7	30.4	30.4	24.9
R3	Future residential development	1-HR	400	51.6	30.4	30.4	12.9
R4	Future residential development	24-HR	200	34.7	27.4	26.5	17.3

Receptor ID	Address	Averaging Period	Criterion (µg/m³)	Maximum cumulative concentration (µg/m³)	Median cumulative concentration (µg/m³)	Minimum cumulative concentration (µg/m³)	Maximum cumulative % of criterion (%)
R3	Future residential development	24-HR	200	29.1	26.6	26.5	14.5
R4	Future residential development	ANNUAL	60	15.3	-	15.1	25.4
R3	Future residential development	ANNUAL	60	14.2	-	14.2	23.7

Table 3-20: Existing Conditions for the Most Impacted Sensitive Receptors – $PM_{2.5}$

Receptor ID	Address	Averaging Period	Criterion (µg/m³)	Maximum cumulative concentration (µg/m³)	Median cumulative concentration (µg/m³)	Minimum cumulative concentration (µg/m³)	Maximum cumulative % of criterion (%)
Spadina-Front GO Station							
R1	26 Telegram Mews	24-HR	27	14.3	14.1	14.0	53.0
		ANNUAL	8.8	8.8	-	-	99.8
Bloor-Lansdowne GO Station							
R12	2/4 Rideau Avenue, Toronto	24-HR	27	14.5	14.2	14.1	53.6
		ANNUAL	8.8	7.8	-	7.8	89.0
Kirby GO Station							
R12	Future Development	24-HR	27	12.9	12.8	12.8	47.6
R10	50 Bestview Crescent, Vaughan	24-HR	27	12.8	12.8	12.8	47.4
R12	Future Development	ANNUAL	8.8	6.7	-	6.7	75.8
R10	50 Bestview Crescent, Vaughan	ANNUAL	8.8	6.7	-	6.7	75.8
Mulock GO Station							
R6	432 Sydor Court	24-HR	27	12.8	12.8	12.8	47.4
		ANNUAL	8.8	6.7	-	6.7	75.8
Innisfil GO Station							
R4	Future residential development	24-HR	27	12.9	12.8	12.8	47.9
R3	Future residential development	24-HR	27	12.8	12.8	12.8	47.5
R4	Future residential development	ANNUAL	8.8	6.7	-	6.7	76.0
R3	Future residential development	ANNUAL	8.8	6.7	-	6.7	75.8

Table 3-21: Existing Conditions for the Most Impacted Sensitive Receptors – Benzene

Receptor ID	Address	Averaging Period	Criterion (µg/m³)	Maximum cumulative concentration (µg/m³)	Median cumulative concentration (µg/m³)	Minimum cumulative concentration (µg/m³)	Maximum cumulative % of criterion (%)
Spadina-Front GO Station							
R1	26 Telegram Mews	24-HR	2.3	1.00	1.00	1.00	43.6
		ANNUAL	0.45	0.80	-	-	177.9
Bloor-Lansdowne GO Station							
R12	2/4 Rideau Avenue, Toronto	24-HR	2.3	1.04	1.03	1.03	45.4
		ANNUAL	0.45	0.67	-	0.67	150.0
Kirby GO Station							
R12	Future Development	24-HR	2.3	0.65	0.65	0.65	28.3
		ANNUAL	0.45	0.44	-	0.44	97.8
Mulock GO Station							
R6	432 Sydor Court	24-HR	2.3	0.65	0.65	0.65	28.3
R6	432 Sydor Court	ANNUAL	0.45	0.44	-	0.44	97.8
Innisfil GO Station							
R4	Future residential development	24-HR	2.3	0.65	0.65	0.65	28.4
R3	Future residential development	24-HR	2.3	0.65	0.65	0.65	28.3
R4	Future residential development	ANNUAL	0.45	0.44	-	0.44	97.9
R3	Future residential development	ANNUAL	0.45	0.44	-	0.44	97.8

Table 3-22: Existing Conditions for the Most Impacted Sensitive Receptors – 1,3-Butadiene

Receptor ID	Address	Averaging Period	Criterion (µg/m^3)	Maximum cumulative concentration (µg/m^3)	Median cumulative concentration (µg/m^3)	Minimum cumulative concentration (µg/m^3)	Maximum cumulative % of criterion (%)
Spadina-Front GO Station							
R1	26 Telegram Mews	24-HR	10	0.10	0.10	0.10	1.0
		ANNUAL	2	0.05	-	-	2.7
Bloor-Lansdowne GO Station							
R12/R14	2/4 Rideau Avenue 2 Merchant Lane	24-HR	10	0.11	0.11	0.11	1.1
		ANNUAL	2	0.060	-	0.060	3.0
Kirby GO Station							
R12	Future Development	24-HR	10	0.05	0.05	0.05	1.5
		ANNUAL	2	0.03	-	0.03	1.3
Mulock GO Station							
R6	432 Sydor Court	24-HR	10	0.05	0.05	0.05	0.5
R6	432 Sydor Court	ANNUAL	2	0.03	-	0.03	1.5
Innisfil GO Station							
R4	Future residential development	24-HR	10	0.05	0.0	0.05	0.5
R3	Future residential development	24-HR	10	0.05	0.05	0.05	0.5
R4	Future residential development	ANNUAL	2	0.03	-	0.03	1.5
R3	Future residential development	ANNUAL	2	0.03	-	0.03	1.5

Table 3-23: Existing Conditions for the Most Impacted Sensitive Receptors – Formaldehyde

Receptor ID	Address	Averaging Period	Criterion (µg/m^3)	Maximum cumulative concentration (µg/m^3)	Median cumulative concentration (µg/m^3)	Minimum cumulative concentration (µg/m^3)	Maximum cumulative % of criterion (%)
Spadina-Front GO Station							
R1	26 Telegram Mews	24-HR	65	4.02	4.00	4.00	6.2
Bloor-Lansdowne GO Station							
R12	2/4 Rideau Avenue, Toronto	24-HR	65	4.29	4.24	4.22	6.6
Kirby GO Station							
R12	Future Development	24-HR	65	4.22	4.21	4.21	6.5
Mulock GO Station							
R6	432 Sydor Court	24-HR	65	4.22	4.22	4.21	6.5
Innisfil GO Station							
R4	Future residential development	24-HR	65	4.22	4.22	4.21	6.5
R3	Future residential development	24-HR	65	4.22	4.21	4.21	6.5

Table 3-24: Existing Conditions for the Most Impacted Sensitive Receptors – Acetaldehyde

Receptor ID	Address	Averaging Period	Criterion (µg/m³)	Maximum cumulative concentration (µg/m³)	Median cumulative concentration (µg/m³)	Minimum cumulative concentration (µg/m³)	Maximum cumulative % of criterion (%)
Spadina-Front GO Station							
R1	26 Telegram Mews	1/2-HR	500	1.1E-02	3.0E-04	0	N/A
		24-HR	500	2.01	2.00	2.00	0.4
Bloor-Lansdowne GO Station							
R12	2/4 Rideau Avenue, Toronto	1/2-HR	500	5.2E-02	5.6E-03	0	0.01
		24-HR	500	1.58	1.56	1.55	0.3
Kirby GO Station							
R12	Future Development	1/2-HR	500	2.5E-02	0	0	<0.01
		24-HR	500	1.55	1.55	1.55	0.3
Mulock GO Station							
R6	432 Sydor Court	1/2-HR	500	8.38E-04	-	-	<0.01
R6	432 Sydor Court	24-HR	500	1.55	1.55	1.55	0.3
Innisfil GO Station							
R4	Future residential development	1/2-HR	500	2.76E-02	0	0	0.01
R3	Future residential development	1/2-HR	500	8.52E-03	0	0	<0.01
R4	Future residential development	24-HR	500	1.56	1.55	1.55	0.3
R3	Future residential development	24-HR	500	1.55	1.55	1.55	0.3

Table 3-25: Existing Conditions for the Most Impacted Sensitive Receptors – Acrolein

Receptor ID	Address	Averaging Period	Criterion (µg/m^3)	Maximum cumulative concentration (µg/m^3)	Median cumulative concentration (µg/m^3)	Minimum cumulative concentration (µg/m^3)	Maximum cumulative % of criterion (%)
Spadina-Front GO Station							
R1	26 Telegram Mews	1-HR	4.5	5.0E-03	1.5E-04	0	N/A
		24-HR	0.4	0.20	0.20	0.20	50
Bloor-Lansdowne GO Station							
R12	2/4 Rideau Avenue, Toronto	1-HR	4.5	1.3E-02	1.4E-03	0	0.3
		24-HR	0.4	0.24	0.24	0.24	60.2
Kirby GO Station							
R12	Future Development	1-HR	4.5	6.2E-03	0	0	0.1
		24-HR	0.4	0.24	0.24	0.24	58.9
Mulock GO Station							
R6	432 Sydor Court	1-HR	4.5	1.90E-04	0	0	<0.01
R6	432 Sydor Court	24-HR	0.4	0.24	0.24	0.24	59
Innisfil GO Station							
R4	Future residential development	1-HR	4.5	6.28E-03	0	0	0.1
R3	Future residential development	1-HR	4.5	1.93E-03	0	0	<0.01
R4	Future residential development	24-HR	0.4	0.24	0.24	0.24	59.0
R3	Future residential development	24-HR	0.4	0.24	0.24	0.24	58.9

Table 3-26: Existing Conditions for the Most Impacted Sensitive Receptors – B(a)P

Receptor ID	Address	Averaging Period	Criterion (µg/m^3)	Maximum cumulative concentration (µg/m^3)	Median cumulative concentration (µg/m^3)	Minimum cumulative concentration (µg/m^3)	Maximum cumulative % of criterion (%)
Spadina-Front Go Station							
R1	26 Telegram Mews	24-HR	5E-05	1.29E-04	1.28E-04	1.28E-04	257
		ANNUAL	1E-05	8.2E-05	-	-	822
Bloor-Lansdowne GO Station							
R12	2/4 Rideau Avenue	1-HR	5E-05	1.30E-04	1.29E-04	1.28E-04	259
		24-HR	1E-05	8.3E-05	-	8.3E-05	826
Kirby GO Station							
R12	Future Development	24-HR	5E-05	1.28E-04	1.28E-04	1.28E-04	257
		ANNUAL	1E-05	8.2E-05	-	8.2E-05	820
Mulock GO Station							
R6	432 Sydor Court	24-HR	5E-05	1.3E-04	1.3E-04	1.3E-04	256
R6	432 Sydor Court	ANNUAL	1E-05	8.2E-05	-	8.2E-05	820
Innisfil GO Station							
R4	Future residential development	24-HR	5E-05	1.29E-04	1.28E-04	1.28E-04	257
R3	Future residential development	24-HR	5E-05	1.28E-04	1.28E-04	1.28E-04	256
R4	Future residential development	ANNUAL	1E-05	8.21E-05	-	8.21E-05	821
R3	Future residential development	ANNUAL	1E-05	8.20E-05	-	8.20E-05	820

3.10 Noise Assessment

3.10.1 Methodology

The objective of the noise study was to assess the potential increase in noise levels in nearby noise sensitive land uses as a result of the GO Stations and related accelerating and decelerating rail traffic. In addition, short-term construction noise impacts on nearby noise and vibration sensitive land uses was also assessed.

Sensitive Receptors were selected to determine noise and vibration level compliance based on the geographical and land use context in the vicinity of the GO Stations as described below.

Based on the Ministry of Environment and Energy (MOEE)[12]/GO Transit Draft Protocol for Noise and Vibration Assessment (NVIA) (MOEE, 1994) (hereafter referred to as the MOEE/GO Transit Draft Protocol), Sensitive Receptors are residential dwellings where people ordinarily sleep or commercial/institutional buildings where occupants are exceptionally sensitive to noise and vibration, such as a hospital. The noise and vibration Sensitive Land Uses likely to experience the greatest effects within all study areas include the residential properties surrounding the existing Barrie rail corridor and the GO Stations. Table 3-27 briefly describes the parameters used for the identification and modelling of points of reception.

Table 3-27: Points of Reception

Noise Receptor	Daytime	Nighttime
Period	07:00h to 23:00h	23:00h to 07:00h
Living Space	Any outdoor location on the property of a sensitive land use where sound originating from the Project is received and which is no less than 15 metres from the nearest track's centre line.	
Receptor Location	3 metres from the unit in the front or back yard whichever is most exposed to the noise source (Low density residential) Plane of the apartment bedroom/living room (High density residential).	Plane of a bedroom window
Height	1.5 metres (Low density residential) Plane of the apartment bedroom/living room (High density residential).	Plane of a bedroom window

Representative noise and vibration Points of Reception (POR) (or receptor locations) were identified based on the existing Noise Sensitive Areas (NSAs) in proximity to the GO Station locations, as well as the future developments noted above.

Key elements of the City of Toronto Noise By-law (City of Toronto, 2009b) related to construction activities include By-law No. 1400-2007 (Construction Noise) (City of Toronto, 2009b) and place limits on the timing of construction activity during nighttime and on Sundays and statutory holidays. The Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment guide (FTA, 2006) includes 80 dBA $L_{eq\ (8hr)}$ and 70 dBA $L_{eq\ (8hr)}$ daytime and

[12] *Since this document was written, the MOE changed its name to the MOECC. The MOE was created in 1972 and merged with the Ministry of Energy to form the MOEE from 1993 to 1997 and again in 2002. The MOE changed its name to the MOECC on June 24, 2014. For the purposes of this Report the MOE, MOEE and MOECC are considered to be synonymous.*

nighttime construction noise criteria for residential land uses. It should be noted that these sound levels cannot be enforced in Canada; however, the FTA criteria can be used to help gauge whether construction sound levels at the receptor level are acceptable or not.

3.10.2 Ambient Sound Levels

A review of available aerial photography of the GO Station study areas indicates that the predominant existing sources for noise are the following:

- Spadina-Front GO Station:
  - Diesel operated bidirectional passenger rail services along the Lakeshore West, Milton, Kitchener and Barrie rail corridors (GO, Union Pearson Express, and VIA Rail); and;
  - Automobile traffic along Bathurst Street, Fort York Boulevard, Front Street West, and Spadina Avenue.
- Bloor-Lansdowne GO Station:
  - Diesel operated passenger rail service along the Barrie rail corridor;
  - Diesel operated passenger rail service along the Kitchener rail corridor;
  - Diesel operated passenger rail service along the Milton rail corridor; and
  - Traffic volumes along Bloor Street West, Dundas Street West, Lansdowne Avenue and Symington Avenue.
- Kirby GO Station:
  - Diesel operated passenger rail service along the Barrie rail corridor; and
  - Traffic volumes along Keele Street and Kirby Road.
- Mulock GO Station:
  - Diesel operated passenger rail service along the Barrie rail corridor; and
  - Traffic volumes along Mulock Drive and Bayview Avenue.
- Innisfil GO Station:
  - Diesel operated rail services along the Barrie rail corridor;
  - Traffic volumes along 6th Line and 20 Sideroad; and
  - Ongoing construction associated with the new Sleeping Lion residential development located east of the GO Station.

The existing noise levels were monitored and used to validate the noise model by comparing the monitoring data to the modelled Current conditions scenario results. Table 3-28 summarizes the corresponding results at the respective noise monitoring locations. For complete monitoring data refer to Appendix H of Volume 2 through Volume 6 of this EPR Addendum. The monitor locations and the identified PORs for the GO Station study areas are

listed in Table 3-30 and shown in Figure 3-19, Figure 3-20, Figure 3-21, Figure 3-22 and Figure 3-23. It should be noted these figures show both monitor locations and identified PORs from the noise assessment and the vibration assessment.

Table 3-28: Summary of Noise Monitoring Results

Address	Monitor Location	Daytime 16-hour $L_{eq\ (16hr)}$	Night time 8-hour $L_{eq\ (8hr)}$
Spadina-Front GO Station			
550 Front Street West, Toronto	M1 (R3)	71 dBA	68 dBA
1 Draper Street, Toronto	M2 (R4)	70 dBA	67 dBA
383 Front Street West, Toronto	M3 (R9)	64 dBA	61 dBA
15 Iceboat Terrace, Toronto	M4 (R17)	64 dBA	61 dBA
Bloor-Lansdowne GO Station			
283 St Helens Avenue, Toronto	M1	60 dBA	51 dBA
120 Wiltshire Avenue, Toronto	M2	67 dBA	62 dBA
Kirby GO Station			
11320 Keele Street, Vaughan	M1	72 dBA	67 dBA
55 Bestview Crescent, Vaughan	M2	55 dBA	48 dBA
Mulock GO Station			
End of Silken Laumann Way, Newmarket	M1	57 dBA	46 dBA
Innisfil GO Station[1]			
1190 Booth Avenue, Innisfil	M2	59*	52
1370 Forest Street, Innisfil	M4	57	54

[1] **Daytime levels are higher than expected due to ongoing residential construction activity. Minimum $L_{eq(16hr)}$ would be considered a better representation and was found to be 57 dBA and 42 dBA for daytime and nighttime, respectively.*

Table 3-29 compares the measured baseline levels to the predicted baseline levels. As noted therein, for all GO Stations there is little difference between the two. The models calibrate well, and can be used to predict future noise levels.

Table 3-29: Validation Between Modeled and Measured Levels

Monitor Location	Measured Noise Level, L_{eq} (DBA)		Predicted Noise Level, L_{eq} (DBA)		Variance L_{eq} (DBA)	
	Daytime $L_{eq\ (16\ hr)}$	Night Time $L_{eq\ (8\ hr)}$	Daytime $L_{eq\ (16\ hr)}$	Night Time $L_{eq\ (8\ hr)}$	Daytime $L_{eq\ (16\ hr)}$	Night Time $L_{eq\ (8\ hr)}$
Spadina-Front GO Station[1]						
M3 (R9)	61.8 dBA	N/A	62.3 dBA	N/A	-0.5 dB	N/A
Bloor-Lansdowne GO Station[2]						
M1	60 dBA	51 dBA	60 dBA	50 dBA	0 dB	1 dB
M2	67 dBA*	62 dBA*	62 dBA	53 dBA	5 dB	9 dB
Kirby GO Station						
M1	72 dBA	67 dBA	74 dBA	66 dBA	+2 dB	-1 dB
M2	55 dBA	48 dBA	57 dBA	49 dBA	+2 dB	+1 dB
Mulock GO Station						
M1	57 dBA	46 dBA	55 dBA	47 dBA	-2 dB	+1 dB
Innisfil GO Station						
M2	54 dBA	42 dBA	54 dBA	44 dBA	0 dB	+2 dB
M4	57 dBA	54 dBA	58 dBA	52 dBA	+1 dB	-2 dB

[1]The measured and predicted sound levels correspond to the noted train pass-by intervals noted on the field survey form presented in Appendix H of Volume 2 of this EPR Addendum.
[2] Levels are higher than expected due to high wind levels being present during the monitoring period. Therefore, results will not be used as basis for comparison.

Table 3-30: Receptor Location by Municipal Address

Receptor	Address	Type of Receptor	Distance to Track (m)
Spadina-Front GO Station			
R1	Bathurst Street Future Development, Toronto	Future Residential Development	28
R2	Niagara Street Future Development, Toronto	Future Residential Development	52
R3	550 Front Street West, Toronto	8.5-storey mixed use residential/commercial	61
R4	1 Draper Street, Toronto	2-storey semi-detached dwelling	72
R5	Front Street West Future Development, Toronto	Future Residential Development	81
R6	Front Street West Future Development, Toronto	Future Residential Development	89

Receptor	Address	Type of Receptor	Distance to Track (m)
R7	Front Street West Future Development, Toronto	Future Residential Development	91
R8	397 Front Street West, Toronto	36-storey condo	51
R9	381 Front Street West, Toronto	27-storey condo	32
R10	373 Front Street West, Toronto	28-storey condo	39
R11	361 Front Street West, Toronto	32-storey condo	49
R12	81 Navy Wharf Court, Toronto	36-storey condo	68
R13	23 Spadina Avenue, Toronto	60-storey condo	76
R14	4K Spadina Avenue, Toronto	16-storey condo	54
R15	25 Telegram Mews, Toronto	48-storey condo	55
R16	25 Capreol Court, Toronto	42-storey condo	55
R17	15 Iceboat Terrace, Toronto	36-storey condo	52
R18	21 Iceboat Terrace, Toronto	36-storey condo	50
R19	150 Fort York Boulevard, Toronto	20-storey condo	58
R20	Bathurst Street Future Development, Toronto	Future Residential Development	57
Bloor-Lansdowne GO Station			
R1	2/4 Rideau Avenue, Toronto	Semi-detached dwelling	32
R2	253A Wabash Avenue, Toronto	Semi-detached dwelling	46
R3	274/276 Wabash Avenue, Toronto	Semi-detached dwelling	68
R4	2 Merchant Lane, Toronto	4-storey townhome block	28
R5	1369 Bloor Street, Toronto	15-storey residential building	41
R6	112/114 Rankin Crescent, Toronto	On-street townhouse	64
R7	132/134 Rankin Crescent, Toronto	On-street townhouse	68
R8	151 Rankin Crescent, Toronto	On-street townhouse	61
R9	175/177 Rankin Crescent, Toronto	On-street townhouse	31
R10	195/197 Rankin Crescent, Toronto	On-street townhouse	32
R11	383 Sorauren Avenue, Toronto	Future mixed-use 11-storey building	181
R12	58 Golden Avenue, Toronto	Detached dwelling	314

Receptor	Address	Type of Receptor	Distance to Track (m)
R13	35/37 Wade Avenue, Toronto	Semi-detached dwelling	90
R14	291/293 St Helens Avenue, Toronto	Semi-detached dwelling	114
R15	284 St Helens Avenue, Toronto	3-storey residential building	11
R16	7 Dora Avenue, Toronto	Detached dwelling	63
R17	218/218A St Helens Avenue, Toronto	Semi-detached dwelling	65
R18	210/210 1/2 St Helens Avenue, Toronto	Semi-detached dwelling	65
R19	171 St Helens Avenue, Toronto	Detached dwelling	110
R20	159 St Helens Avenue, Toronto	Detached dwelling	109
R21	138 St Helens Avenue, Toronto	Mixed-use 9-storey building	8
R22	409/411 Lansdowne Avenue, Toronto	Semi-detached dwelling	206
R23	393/395 Lansdowne Avenue, Toronto	Semi-detached dwelling	206
R24	379 Lansdowne Avenue, Toronto	Detached dwelling	204
R25	363 Lansdowne Avenue, Toronto	Detached dwelling	204
R26	351 Lansdowne Avenue, Toronto	Semi-detached dwelling	204
R27	17, 19, 21-13, Lumbervale Avenue, Toronto	3-storey residential building	101
R28	285 Lansdowne Avenue, Toronto	On-street townhouse	157
R29	275 Lansdowne Avenue, Toronto	On-street townhouse	151
R30	261 Lansdowne Avenue, Toronto	On-street townhouse	135
R31	247 Lansdowne Avenue, Toronto	Detached dwelling	119
R32	231 Lansdowne Avenue, Toronto	Detached dwelling	88
R33	219/221/223 Lansdowne Avenue, Toronto	On-street townhouse	67
R34	211 Lansdowne Avenue, Toronto	On-street townhouse	53
R35	2/4 Adrian Avenue, Toronto	Semi-detached dwelling	123
R36	18 Wiltshire Avenue, Toronto	Detached dwelling	122
R37	32/34/36 Wiltshire Avenue, Toronto	Semi-detached dwelling	116
R38	50/52 Wiltshire Avenue, Toronto	Semi-detached dwelling	107
R39	70/72 Wiltshire Avenue, Toronto	Semi-detached dwelling	97

Receptor	Address	Type of Receptor	Distance to Track (m)
R40	88/90 Wiltshire Avenue, Toronto	Semi-detached dwelling	89
R41	104 Wiltshire Avenue, Toronto	Detached dwelling	79
R42	120/122 Wiltshire Avenue, Toronto	Semi-detached dwelling	87
R43	148/150 Wiltshire Avenue, Toronto	Semi-detached dwelling	84
R44	184-190 Wiltshire Avenue, Toronto	On-street townhouse	77
R45	226-323 Wiltshire Avenue, Toronto	On-street townhouse	68
R46	1292/1294 Lansdowne Avenue, Toronto	Semi-detached dwelling	322
R47	1280 Lansdowne Avenue, Toronto	Detached dwelling	305
R48	1256/1258 Lansdowne Avenue, Toronto	Semi-detached dwelling	285
R49	1246 Lansdowne Avenue, Toronto	Detached dwelling	277
R50	1228/1230 Lansdowne Avenue, Toronto	Semi-detached dwelling	258
R51	1216 Lansdowne Avenue, Toronto	Detached dwelling	249
R52	1202/1204 Lansdowne Avenue, Toronto	Semi-detached dwelling	234
R53	1265/1267 Lansdowne Avenue, Toronto	Semi-detached dwelling	285
R54	1253/1255 Lansdowne Avenue, Toronto	Semi-detached dwelling	278
R55	1273 Lansdowne Avenue, Toronto	Semi-detached dwelling	268
R56	30 Turntable Crescent, Toronto	4-storey residential building	31
Kirby GO Station			
R1	11244 Keele Street, Vaughan	Detached dwelling	285
R2	32 Crestbank Court, Vaughan	On-street townhouse	381
R3	18 Crestbank Court, Vaughan	On-street townhouse	391
R4	8 Crestbank Court, Vaughan	On-street townhouse	393
R5[1]	11320 Keele Street, Vaughan	Detached dwelling	313
R6	17-320 Ravineview Drive, Vaughan	On-street townhouse	380
R7	300 Ravineview Drive, Vaughan	2-Storey long term care facility	459
R8	11399 Keele Street, Vaughan	Day care center	348
R9[2]	50 Bestview Crescent, Vaughan	Detached dwelling	365

Receptor	Address	Type of Receptor	Distance to Track (m)
R10	62 Bestview Crescent, Vaughan	Detached dwelling	359
R11[3]	2840 Kirby Road, Vaughan	Detached dwelling	307
R12	11290 Keele Street	Detached dwelling	328
Mulock GO Station			
R1	448 Oak Street, Newmarket	Detached dwelling	111
R2	459 Oak Street, Newmarket	Detached dwelling	185
R3	16808 Bayview Avenue, Newmarket	Detached dwelling	294
R4	16782 Bayview Avenue, Newmarket	Detached dwelling	317
R5	528 Ainsworth Drive, Newmarket	On-street townhouse	397
R6	578/580 Pinder Avenue, Newmarket	Semi-detached dwelling	505
R7	602/604 Pinder Avenue, Newmarket	Semi-detached dwelling	532
R8	630/632 Pinder Avenue, Newmarket	Semi-detached dwelling	556
R9	585 Pelletier Court, Newmarket	Detached dwelling	357
R10	595 Pelletier Court, Newmarket	Detached dwelling	375
R11	603 Pelletier Court, Newmarket	Detached dwelling	395
R12	624 McBean Avenue, Newmarket	Detached dwelling	279
R13	436/438 Syndor Court, Newmarket	Semi-detached dwelling	167
Innisfil GO Station			
R1	1350 6th Line, Innisfil	Detached dwelling	280
R2[4]	1438 6th Line, Innisfil	Detached dwelling	190
R3	Street H – in Sleeping Lion Development, Innisfil	Future on-street townhouse	58
R4	Street H – in Sleeping Lion Development, Innisfil	Future on-street townhouse	57
R5	Street H – in Sleeping Lion Development, Innisfil	Future on-street townhouse	57
R6	Street H – in Sleeping Lion Development, Innisfil	Future on-street townhouse	57
R7	Street F – in Sleeping Lion Development, Innisfil	Future detached dwelling	58
R8	Street F – in Sleeping Lion Development, Innisfil	Future detached dwelling	62

Receptor	Address	Type of Receptor	Distance to Track (m)

[1] *R5 corresponds to SR035 in the EPR dated August 2017 (RWDI, 2017).*
[2] *R9 corresponds to SR036 in the EPR dated August 2017 (RWDI, 2017).*
[3] *R11 corresponds to SR037 in the EPR dated August 2017 (RWDI, 2017).*
[4] *R2 corresponds to SR132 in the EPR dated August 2017 (RWDI, 2017).*

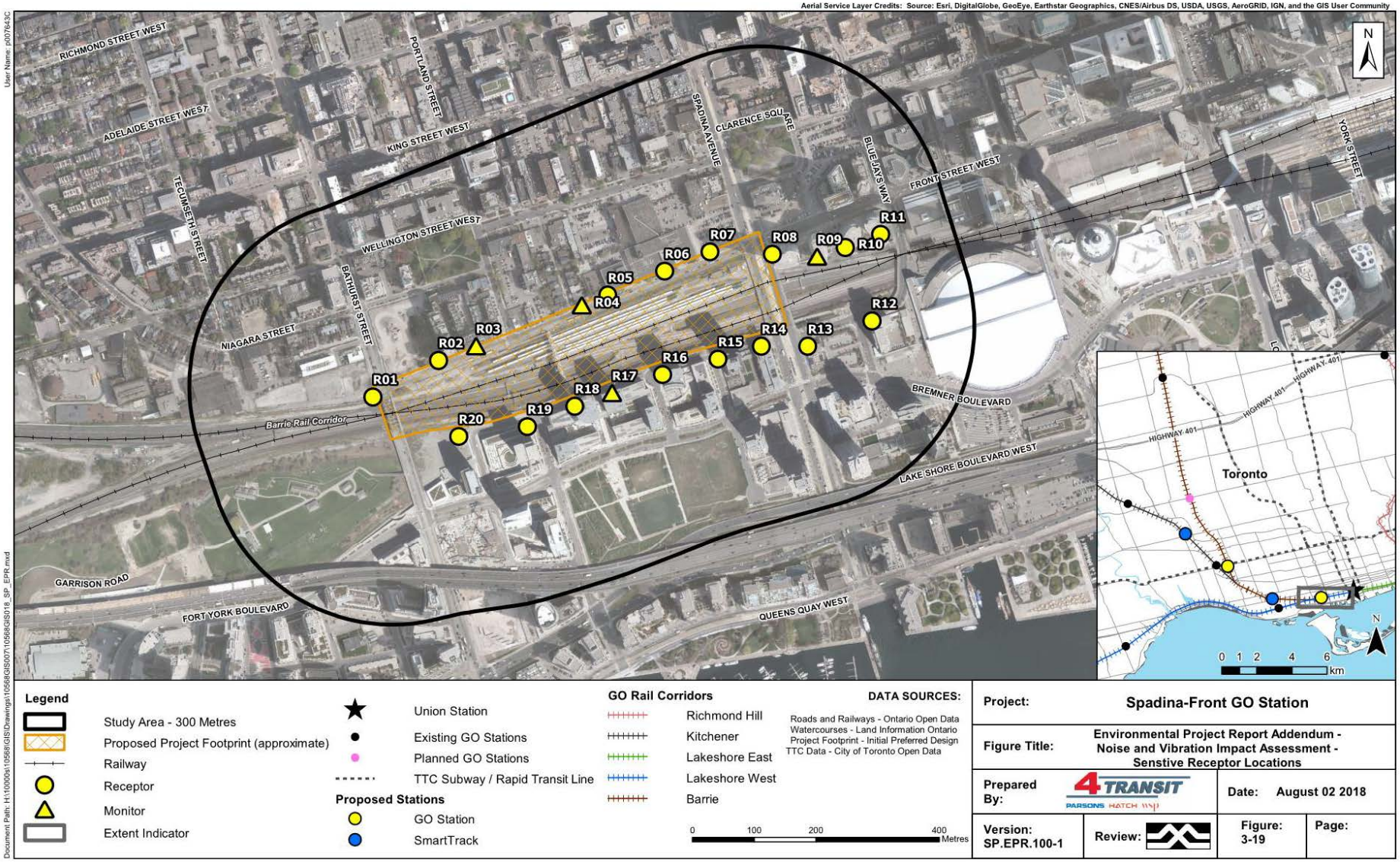


Figure 3-19: Spadina-Front GO Station – Noise and Vibration Impact Assessment Sensitive Receptor and Monitor Location

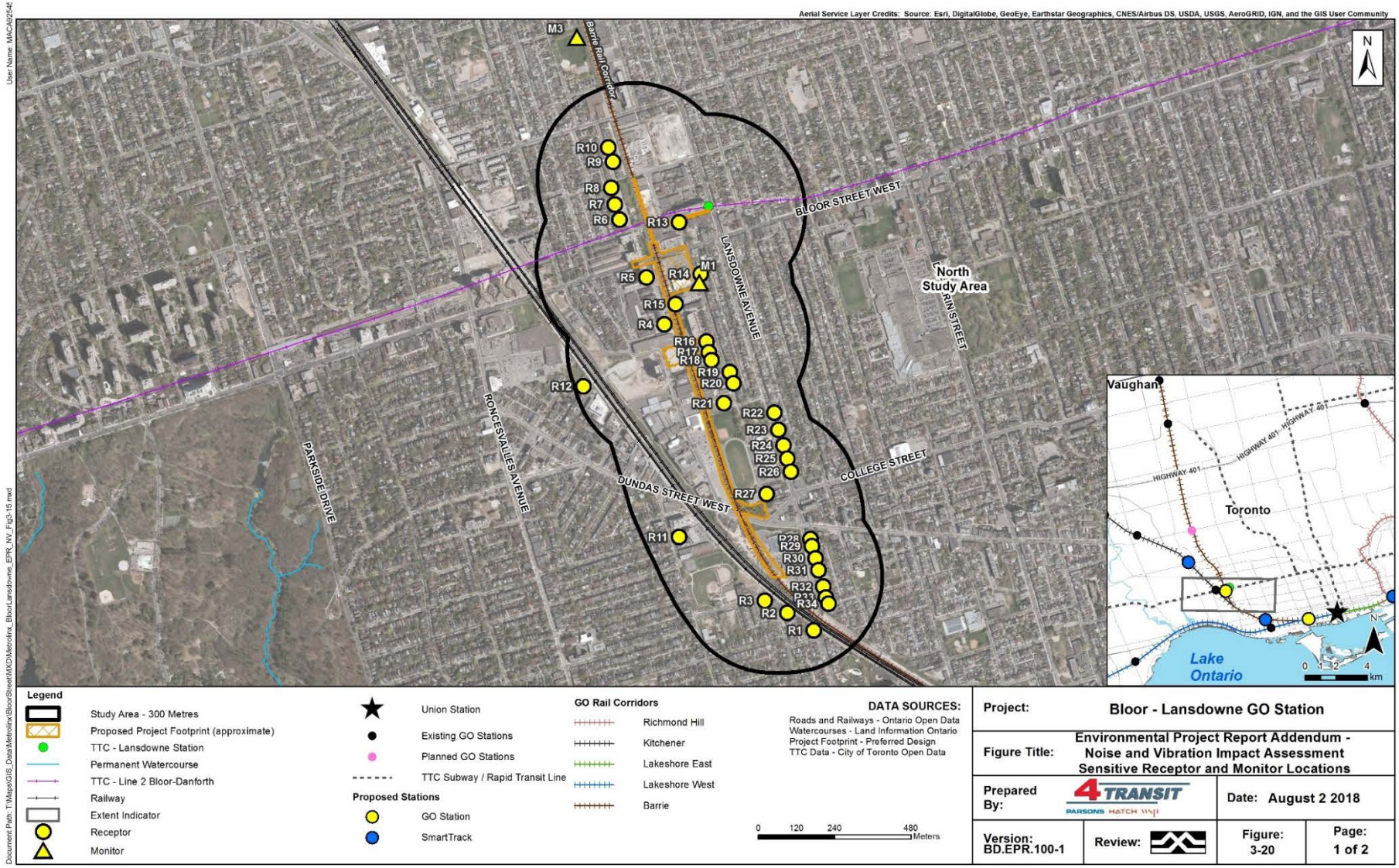


Figure 3-20: Bloor-Lansdowne GO Station – Noise and Vibration Impact Assessment Sensitive Receptor and Monitor Locations

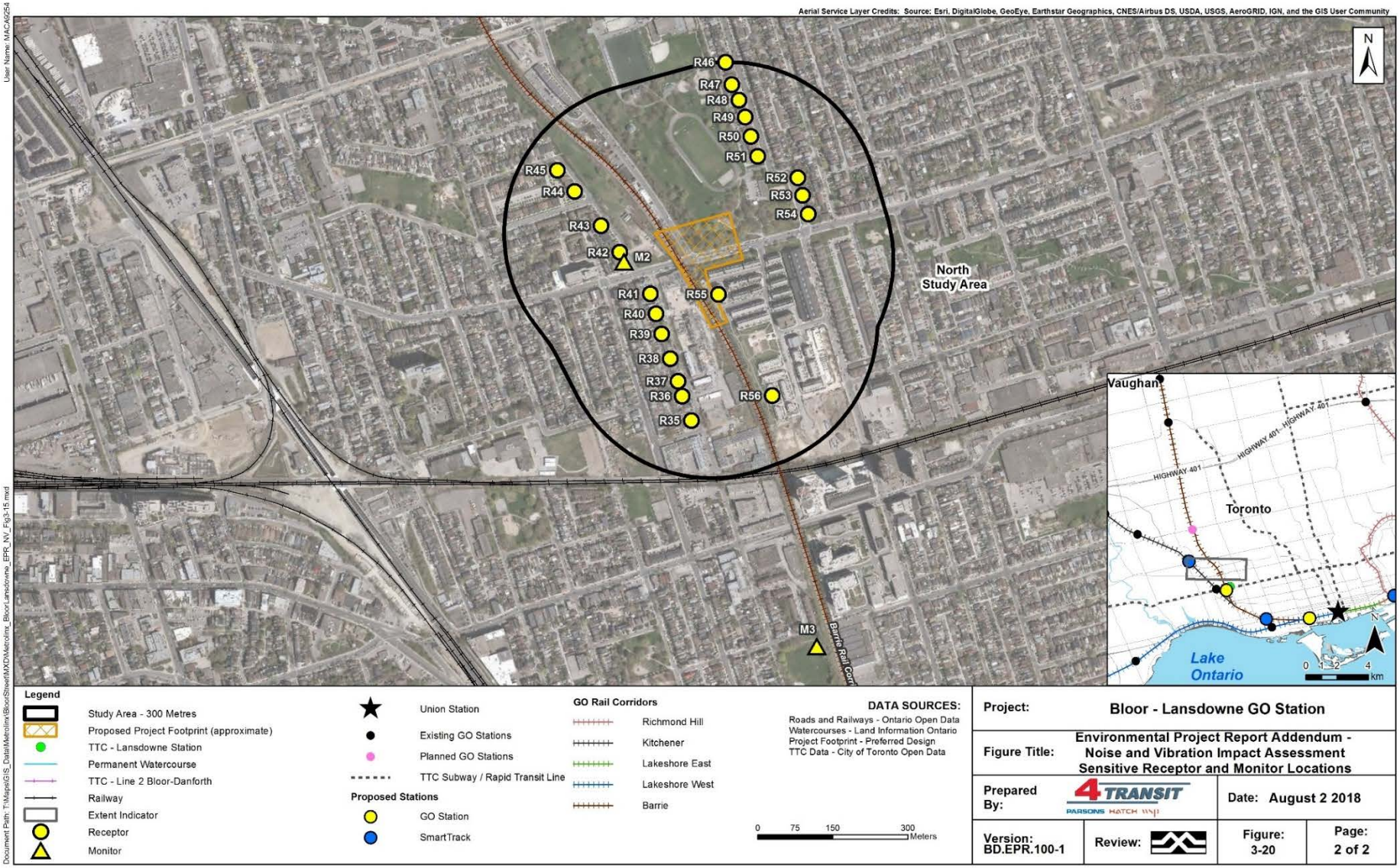


Figure 3-20: Bloor-Lansdowne GO Station – Noise and Vibration Impact Assessment Sensitive Receptor and Monitor Locations

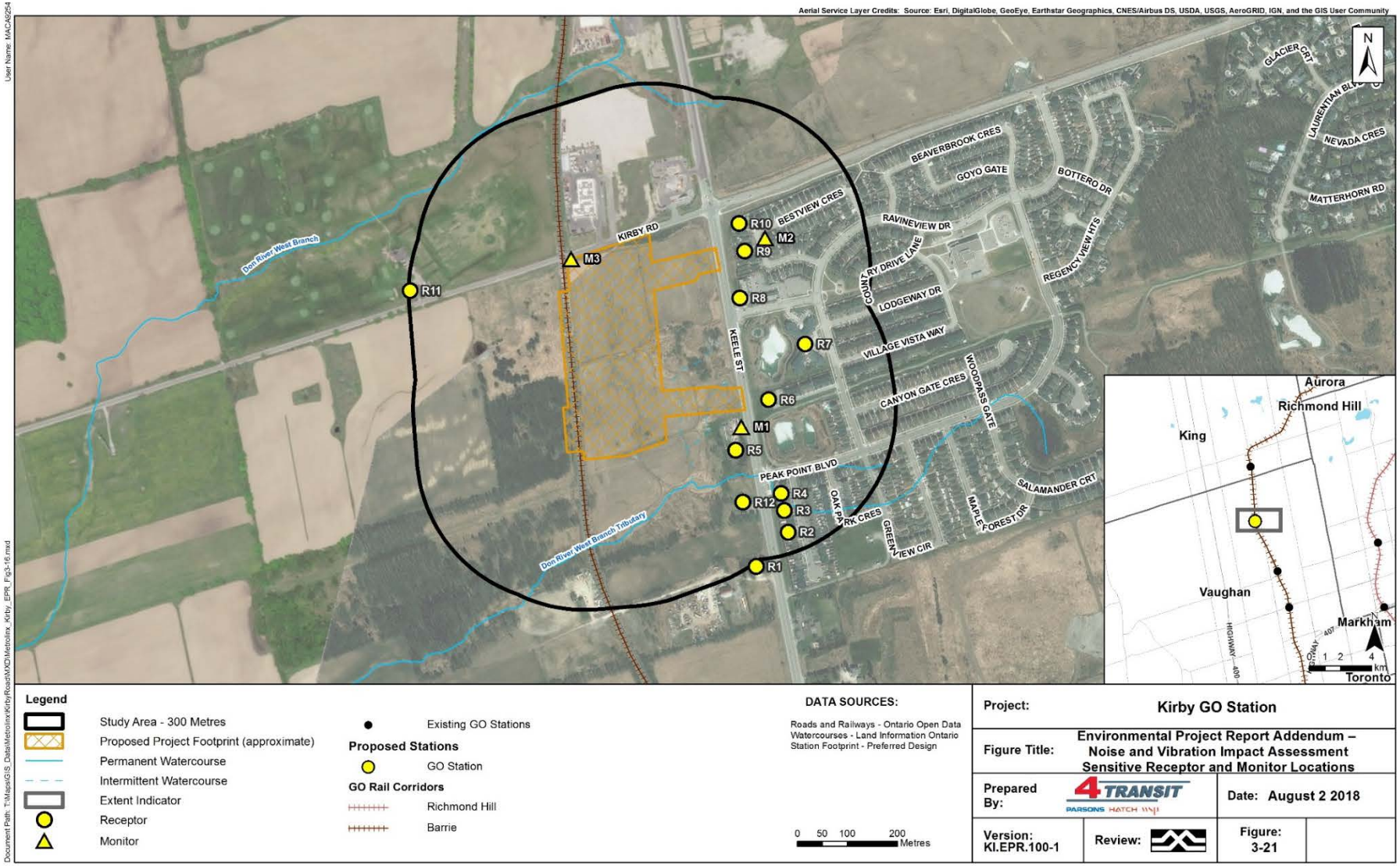


Figure 3-21: Kirby GO Station – Noise and Vibration Impact Assessment – Sensitive Receptor and Monitor Locations

Figure 3-22: Mulock GO Station – Noise and Vibration Impact Assessment Sensitive Receptor and Monitor Location

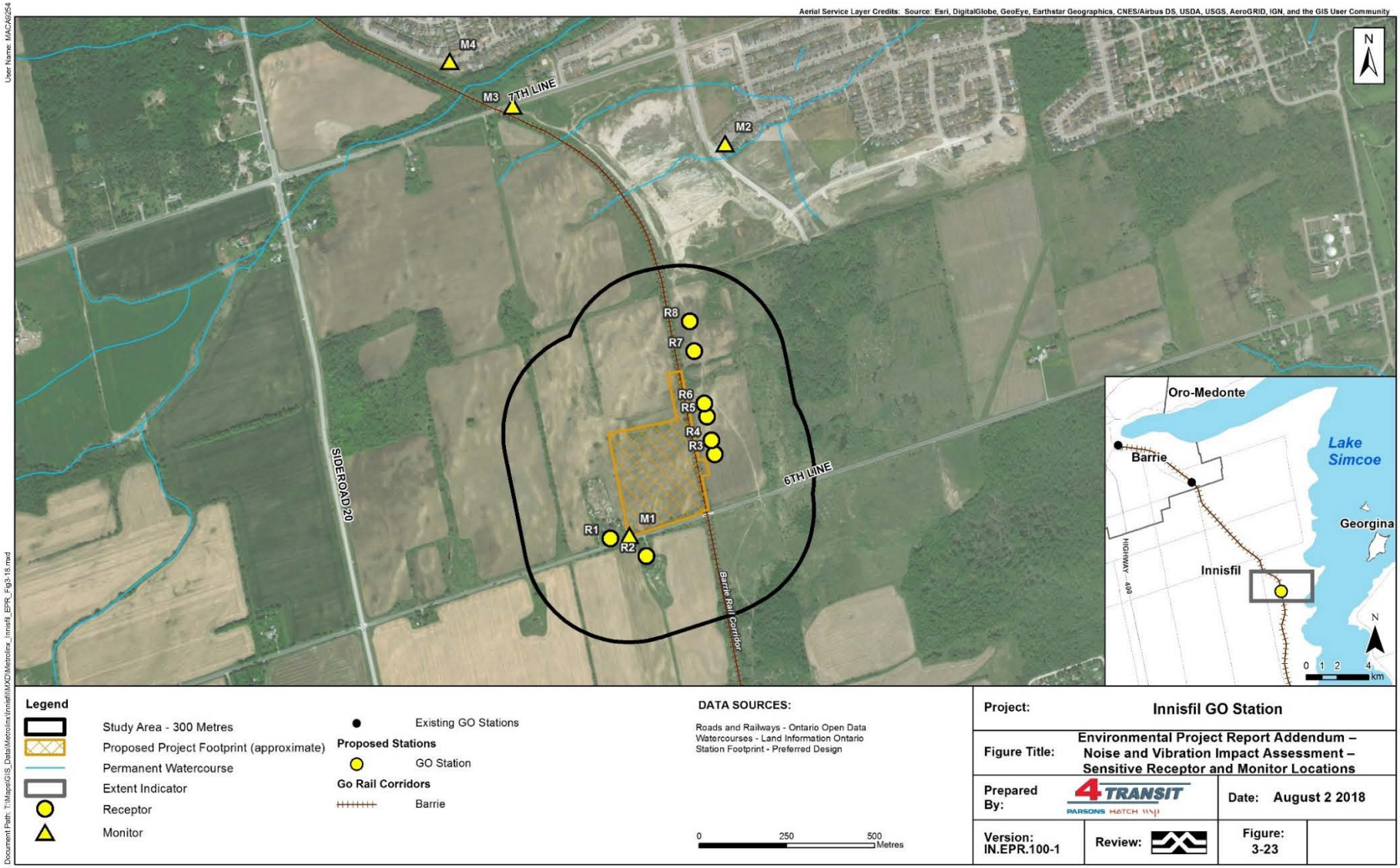


Figure 3-23: Innisfil GO Station – Noise and Vibration Impact Assessment Sensitive Receptor and Monitor Locations

3.11 Vibration Assessment

3.11.1 Methodology

The objective of the vibration study was to assess the potential vibration impact to nearby properties due to the introduction of accelerating and decelerating rail traffic as a result of the GO Stations. In addition, short-term construction vibration impacts on nearby noise and vibration sensitive land uses was also assessed.

Sensitive Receptors were selected to determine noise and vibration level compliance based on the geographical and land use context in the vicinity of the GO Stations as described in Section 3.10. Representative noise and vibration points of reception (or receptor locations) were identified based on the existing NSAs in proximity to the GO Station locations, as well as the future developments noted above. The identified PORs for each study area are listed in Section 3.10.

The vibration assessment is based on the MOEE/GO Transit Draft Protocol dated January 1995. The operational vibration criteria are to ensure vibration emissions associated with the Future Build scenario do not exceed:

- 0.14 millimetres per second (mm/sec) Root-Mean-Square velocity (RMS) at a point of vibration reception and assessment; or
- Increase by more than 25 percent between the Future Build and Future No-Build scenario.

The Point of Vibration Assessment is the location five to ten metres away from the building foundation in a direction parallel to the Barrie rail corridor or adjusted as required to accommodate site conditions. The impact at a Point of Vibration Assessment will fall into one of four categories, as shown in Table 3-31 (MOEE, 1994).

Table 3-31: Vibration Assessment Criteria

Category	Existing Vibration Velocity	Future Vibration Velocity
A	Less than 0.14 mm/s	Less than 0.14 mm/s
B	Less than 0.14 mm/s	Greater than 0.14 mm/s
C	Greater than 0.14 mm/s	Same as existing vibration velocity
D	Greater than 0.14 mm/s	Exceed the existing vibration velocity

Where the objective is exceeded by 25 percent, vibration controls are to be investigated, taking into consideration administrative, aesthetic, economic and technical feasibility.

To be consistent with other Metrolinx projects, vibration levels due to construction shall employ the City of Toronto By-law No. 514-2008 (City of Toronto, 2008). This By-law stipulates that no person shall carry on a construction activity resulting in construction vibrations that exceed the levels set out in Table 3-32.

As per the City of Toronto By-law No. 514-2008, if any structures fall within the zone of influence (ZOI), Metrolinx will undertake construction vibration monitoring to ensure that the vibration levels noted in Table 3-32 are not exceeded. The ZOI is defined as the area of land adjacent

to or within the construction site, delineated at a PORs where the Peak Particle Velocity (PPV) is measured to be greater or equal to five mm/s (City of Toronto, 2008).

Table 3-32: City of Toronto Prohibited Vibration Limits

Frequency of Vibration (Hertz)	Vibration Peak Particle Velocity (mm/s)
Less than 4	8
4 to 10	15
More than 10	25

Vibration levels were modelled using the General Vibration Assessment method outlined in the FTA Transit Noise and Vibration Impact Assessment Guide (FTA, 2006) This methodology involves predicting vibration levels by initially selecting a generalized ground surface vibration curve specific to the rail vehicle type. Adjustments are applied to the generalized ground surface curve to account for locomotive power, track conditions, train speed, suspension type, and other parameters in order to estimate the vibration level at the Sensitive Receptor.

Construction vibration levels were predicted using the methodology outlined in the FTA Transit Noise and Vibration Impact Assessment Guide. The methodology applies ground borne vibration propagation adjustments to reference construction equipment vibration levels. The propagation model accounts for distance and ground conditions. The estimated vibration levels were compared with the City of Toronto ZOI PPV threshold of five mm/sec, outlined in the City of Toronto By-law No. 514-2008 (City of Toronto, 2008).

3.11.2 Existing Conditions

Based on the above review, the predominant existing sources of vibration include the following:

- Spadina-Front GO Station:
  - Diesel operated bidirectional passenger rail services along the Lakeshore West, Milton, Kitchener and Barrie rail corridors;
  - Freight trains; and
  - Automobile traffic along adjacent local streets.
- Bloor-Lansdowne GO Station:
  - Diesel operated passenger rail service along the Barrie rail corridor;
  - Diesel operated passenger rail service along the Kitchener rail corridor;
  - Diesel operated passenger rail service along the Milton rail corridor; and
  - Traffic volumes along Bloor Street West, Dundas Street West, Lansdowne Avenue and Symington Avenue.
- Kirby GO Station:
  - Diesel operated passenger rail service along the Barrie rail corridor; and
  - Traffic volumes along Keele Street, and Kirby Road.

- Mulock GO Station:
  - Diesel operated rail services along the Barrie rail corridor; and
  - Traffic volumes along Mulock Drive and Bayview Avenue.
- Innisfil GO Station:
  - Diesel operated rail services along the Barrie rail corridor; and
  - Ongoing construction associated with the new Sleeping Lion residential development located east of the GO Station.

The monitored existing vibration levels were used to validate the vibration models by comparing the monitoring data to the modeled Current conditions scenario results. Table 3-33 summarizes the corresponding results from the vibration monitoring locations.

Table 3-33: Summary of Vibration Monitoring Results

Monitor Location	Address	Peak Particle Velocity (mm/s)
Spadina-Front GO Station		
M1 (R3)	550 Front Street West, Toronto	0.10
M2 (R4)	1 Draper Street, Toronto	0.16
M3 (R9)	383 Front Street West, Toronto	0.05
M4 (R17)	15 Iceboat Terrace, Toronto	0.14
Bloor-Lansdowne GO Station		
Campbell Park – 8 metres from track, Toronto	M3	0.28
Campbell Park – 12 metres from track, Toronto	M3	0.13
Kirby GO Station		
11320 Keele Street	M3	0.88
Mulock GO Station		
North-east corner of intersection of Mulock Drive and Barrie rail corridor, Newmarket	M2	0.89
Innisfil GO Station		
1350 6th Line, Innisfil	M1	0.0015
South-east corner of at-grade crossing of Barrier rail corridor and 7th Line, Innisfil	M3	0.39

Table 3-34 compares the measured baselines to the predicted baselines. The measured vibration levels are two times less than those predicted at the same location. Therefore, the vibration prediction model method is considered as substantially conservative.

Table 3-34: Spadina-Front GO Station – Validation Between Modeled and Measured Levels

Monitor Location	Measured Peak Particle Velocity (mm/sec)	Predicted Peak Particle Velocity (mm/sec)	Variance (mm/sec)
Spadina-Front GO Station			
M3 (R9)	0.05	0.06	-0.01
Bloor-Lansdowne GO Station			
M3	0.28	0.61	0.33
M3	0.13	0.34	0.21
Kirby GO Station			
M3	0.88	0.95	0.07
Mulock GO Station			
M2	0.89	0.95	0.06
M2	0.56	0.61	0.05
Innisfil GO Station			
M3	0.39	0.49	0.10

3.12 Traffic and Transportation Infrastructure

3.12.1 Methodology

The purpose of a TTIA is to examine potential impacts and propose mitigation measures where necessary. A detailed TTIA for the Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations is provided in Appendix I of Volume 3 through Volume 6 of this EPR Addendum. A Transportation Brief was prepared for the Spadina-Front GO Station based upon guidance from the City of Toronto as noted in Section 3.12.2; that report is provided in Appendix I of Volume 2 of this EPR Addendum.

Traffic operations analysis was conducted at the GO Station study area intersections to assess the potential effects during construction of the GO Stations. The existing traffic operations were characterized in the weekday morning (A.M.) and afternoon (P.M.) peak hours using hourly traffic volume data and traffic control information at each intersection. The A.M. and P.M. peak hours generally represent the time periods during which the “worst case” traffic occurs on a road network. The traffic conditions in the construction year were investigated by accounting for projected traffic growth in the area and the presence of additional construction vehicles in the traffic stream.

For the GO Station study area intersections, a capacity and LOS operational analysis was completed using Synchro 9 traffic analysis software which implements methodologies defined in the Highway Capacity Manual (HCM). Capacity is assessed based on the volume-to-capacity (v/c) ratio, which is the ratio of demand flow rate to the available capacity at the intersection. The v/c ratio provides an estimate of capacity sufficiency based on the specific geometry and control design of an intersection. A v/c ratio equal to or greater than one indicates that a lane group, an approach or the overall intersection is operating at effective capacity and that congestion is present.

Operations are defined by the concept of LOS, which is a key measure of effectiveness for both signalized and unsignalized intersections and is based on the average stopped delay per vehicle, in seconds. It is a qualitative measure of the intersection’s (or individual movement’s)

ability to accommodate traffic volumes. There are six levels of service defined with LOS A representing the best operating conditions and LOS F, the worst. For signalized and all-way stop controlled intersections, the LOS presented is for the intersection as a whole. For unsignalized intersections that are not all-way stop controlled, all movements are considered on an individual basis. The LOS criteria as defined in the HCM are summarized in Table 3-35.

Table 3-35: Level of Service Definitions

Level of Service	Signalized Intersection Control Delay per Vehicle (s/veh)	Unsignalized Intersection Control Delay per Vehicle (s/veh)
A (FREE FLOW)	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E (CAPACITY)	> 55 and ≤ 80	> 35 and ≤ 50
F (FORCED FLOW)	> 80	> 50

The City of Toronto considers a “critical” capacity or LOS condition to occur when the v/c exceeds 1.0 or, when LOS exceeds “E” for either through movements or shared/exclusive turning lanes on the intersection approaches.

York Region presents the following criteria for “critical” intersections or turning movements:

- Intersections are “critical” when the overall v/c exceeds 0.85 in urban areas and 0.70 in rural areas; and
- Individual movements are “critical” when:
  - Their v/c ratio exceeds 0.85 in urban areas and 0.70 in rural areas;
  - Exclusive turning movements result in queues exceeding available storage space; and
  - Exclusive left- or right-turn lanes are inaccessible due to the length of the queues in the adjacent through lanes.

The County of Simcoe General Guidelines for Traffic Impact Studies provides formal guidelines and standards for undertaking Traffic Impact Studies (County of Simcoe, 2017). However, the document does not provide criteria for “critical” intersections or turning movements.

It is common industry practice to consider turning movements “critical” when their v/c ratio exceeds 0.85 or the movement operates at LOS E or F.

For mid-block sections, the quality of service was characterized based on the v/c ratio for the link. Similar to the intersection capacity analysis, an at-capacity condition on a mid-block section is represented by a v/c ratio of one (i.e., volume demand equals theoretical capacity). A v/c ratio of 0.85 or less was deemed an acceptable operation for mid-block locations. Road segments with v/c ratios exceeding this threshold are approaching effective capacity and may be considered as candidates for road widening.

3.12.2 Spadina-Front GO Station

Given the specific access characteristics of this GO Station and the fact that traffic effects from the generation of automobile trips are not expected to be significant, it was determined that a

Transportation Brief, instead of a full TTIA would be conducted based on the City of Toronto directions and the City's TIS Guidelines. A Transportation Brief focus is to assess the impact of a development on local transportation network, to identify required infrastructure, program, and site design mitigation measures that will support system-wide transportation objectives. Focus was placed on identifying the number of multi-modal trips and critical movements at the adjacent intersections generated by the GO Station to identify appropriate mitigation measures. Public Transit is addressed in Section 2.3.6. Enhancements providing pedestrian and cycling access into the GO Station from either side of the rail corridor have been proposed as part of the GO Station. Key incentives include:

- Connectivity to the future below grade PATH tunnels at the Well development proposal (immediately north of the GO Station site);
- The western end of the platform protects for a potential future vertical access connection to future development above the corridor proposed by others;
- A signalized pedestrian crossing on Front Street West, directly in front of the west GO Station entrance; and
- A new sidewalk along the south side of Front Street West between Spadina Avenue and Puente de Luz Bridge.

The existing road network within the Spadina-Front study area is comprised of major and minor arterials, as well as collector and local roads, as detailed by the City of Toronto Road Classification of Streets List (2013).

3.12.3 Bloor-Lansdowne GO Station

The Bloor-Lansdowne study area for the TTIA includes consideration of both the Bloor-Lansdowne GO Station, as well as a new MUP bridge over Davenport Road onto Earlscourt Park north of the proposed GO Station. The intersections in the Bloor-Lansdowne study area are controlled by traffic signals and two-way stop signs. Public transit is addressed in Section 2.4.6.

The existing road network within the Bloor-Lansdowne study area is comprised of major and minor arterials, collector roads and local roads, as detailed by the City of Toronto Road Classification of Streets List (2013) (Table 3-36).

Table 3-36: Bloor-Lansdowne GO Station Road Classification

Road	Classification	Description
Bloor Street West	Major Arterial Road	Bloor Street West runs in an east-west direction within the Bloor-Lansdowne study area and consists of two lanes in each direction. The road has an urban cross section with curb and gutter and sidewalks on both sides of the road. There are no cycling facilities along this stretch of Bloor Street West. The posted speed limit is 40 km/h.
Dundas Street West	Minor Arterial Road	Dundas Street West runs in a northwest-southeast direction within the Bloor-Lansdowne study area and consists of two lanes in each direction. A streetcar route runs through the center of the road. The road has an urban cross section with curb and gutter and sidewalks on both sides of the road. There are bike lanes along Dundas Street from just west of Sterling Road to the intersection with Lansdowne Avenue. The posted speed limit is 40 km/h.
College Street	Minor Arterial Road	A short stretch of College Street runs in an east west direction within the Bloor-Lansdowne study area between Dundas Street West and Lansdowne Avenue. The road includes two through lanes in each direction with streetcar lines through the center, and has an urban cross section with curb and gutter. There are sidewalks and bike lanes on both sides along this stretch of the street. The posted speed limit is 40 km/h.
Lansdowne Avenue	Minor Arterial Road	Lansdowne Avenue is a two lane north south road between Bloor Street West and College Street, with additional turning lanes at key intersections. It is four lanes wide between Bloor Street West and Wallace Avenue in the south study area, and between Dupont Street and Davenport Road in the north study area. The road has an urban cross section with curb and gutter and sidewalks present on both sides. There are no cycling facilities along Lansdowne Avenue in the overall Bloor-Lansdowne study area. The posted speed limit is 40 km/h.
Symington Avenue	Collector Road	Symington Avenue is a two-lane road within the south study area between Wallace Avenue and Bloor Street West, running in a north south direction. North of Dupont Street, the road has four lanes up to Kingsley Avenue and passes under a CP rail bridge. Symington Avenue drops down to two lanes between Kingsley Avenue and Davenport Road.
Wallace Avenue	Collector Road	Wallace Avenue runs in an east west direction within the overall Bloor-Lansdowne study area and consists of a single lane in each direction. The roadway has an urban cross section with curb and gutter, and sidewalks are on both sides. The posted

Road	Classification	Description
		speed limit is 30 km/h. The Barrie rail corridor crosses Wallace Avenue at grade between Symington Avenue and Lansdowne Avenue.
Davenport Road	Minor Arterial	Davenport Road is a two-lane road running in an east west direction. The roadway has an urban cross section with curb and gutter. The posted speed limit is 40 km/h. Sidewalks, as well as painted bicycle lanes are on both sides of the in the Bloor-Lansdowne study area.
Dupont Street	Major Arterial	Dupont Street is a two lane road, and runs primarily in an east west direction. The roadway has an urban cross section with curb and gutter. The posted speed limit is 40 km/h. Sidewalks and painted bicycle lanes are on both sides of the road in the Bloor-Lansdowne study area.

3.12.4 Kirby GO Station

The existing road network within the Kirby GO Station study area is comprised of major and minor arterials, collector roads and local roads, as detailed in the City of Vaughan TMP (City of Vaughan, 2012). Public Transit is addressed in Section 2.5.6 of this EPR Addendum.

Table 3-37 describes the classification of arterial roads and collector roads in the Kirby study area.

Table 3-37: Kirby GO Station Road Classification

Road	Classification	Description
Kirby Road	Minor Arterial	Kirby Road runs in an east-west direction within the Kirby study area and consists of a single lane in each direction. The roadway has a rural cross section with gravel shoulders but no sidewalk on either side of the street. The posted speed limit is 60 kilometres per hour (km/h).
Dufferin Street	Regional Major Arterial	Dufferin Street runs in a north-south direction and consists of a single lane in each direction within the Kirby study area. The roadway has a rural cross section with paved shoulders on both sides of the street which serve as a dedicated cycling facility. There are no sidewalks on either side of the street in the Kirby study area. The posted speed limit is 70 km/h.
Jane Street	Regional Major Arterial	Within the Kirby study area, Jane Street is a north-south road with a single lane in each direction and dedicated turning lanes at its intersection with Teston Road to the south. The roadway has a rural cross section with paved shoulders on both sides. The paved shoulders serve as dedicated cycling facilities on both sides of the street between Teston Road and King Vaughan Road. A narrow sidewalk runs northerly for a short distance from Teston Road, along the east side of the Jane

Road	Classification	Description
		Street, after which there are no sidewalks on either side of the road. The posted speed limit is 60 km/h.
Teston Road	Regional Major Arterial	Teston Road is a five-lane east-west corridor between Jane Street and Keele Street. There are dedicated turn lanes with raised medians at key intersections along this stretch. The roadway has an urban cross section with curb and gutter. There is a multi-purpose path along the south side of the road providing pedestrian access to the neighborhoods and separated cycling facilities along Jane Street. The posted speed limit is 60 km/h.
Keele Street	Regional Major Arterial	Keele Street runs in a north-south direction with two lanes in each direction, and dedicated turning lanes at its intersection with Teston Road. The Barrie rail corridor crosses Keele Street just north of Teston Road at a grade-separated road-over-rail crossing. There is mountable curb and gutter on either side of the street between Teston Road and the northern end of the bridge slab of the grade separated rail crossing. North of the bridge, the street had a rural cross section with paved shoulders serving as dedicated cycling facilities. The posted speed limit is 70 km/h.
King Vaughan Road	Regional Major Arterial	King Vaughan Road is a two-lane municipal road running in an east-west direction between Jane Street and Keele Street. There are limited granular shoulders on each side and no sidewalks or cycling facilities. The speed limit on this road is 80 km/h. The Barrie rail corridor crosses King Vaughan Road at grade, approximately 190 metres west of the intersection of King Vaughan Road and Keele Street.

3.12.5 Mulock GO Station

The existing road network within the Mulock study area is comprised of arterial roads, collector roads and local roads as described by the Town of Newmarket OP (2014), and the Town of Aurora OP (2010). Public Transit is addressed in Section 2.6.6 of this EPR Addendum.

Table 3-38 describes the classification of arterial roads and collector roads in the Mulock study area.

Table 3-38: Mulock GO Station Road Classification

Road	Classification	Description
Mulock Drive	Regional Arterial Road	Mulock Drive runs in an east west direction within the Mulock study area and consists of two lanes in each direction and a center two way left turn lane, with dedicated turning lanes at intersections. The roadway has an urban cross section with curb and gutter. There are sidewalks on both sides of the street. The posted speed limit is 60 km/h.

Road	Classification	Description
Bayview Avenue	Regional Arterial Road	South of Mulock Drive, Bayview Avenue is a north south arterial road with two lanes in each direction. There is a center two way left turn lane along Bayview Avenue between Mulock Drive and Stonehaven Avenue and between Laurelwood Gate and St. John's Sideroad. There are dedicated turning lanes and median island treatments at the intersections in this section of the roadway. Within the Mulock study area, Bayview Avenue to the north of Mulock Drive is classified as a two lane primary collector road with dedicated turning lanes at key intersections.
Yonge Street	Regional Arterial Corridor	Yonge Street is a five lane north south regional arterial corridor between Jane Street and Keele Street, with two lanes in each direction and a center two way left turn lane for most of the Mulock study area. There are dedicated turn lanes with raised medians at key intersections and a center median between Mulock Drive and Sawmill Valley Drive to the south of Mulock Drive. The roadway has a semi rural cross section with paved shoulders between St. John's Sideroad and Sawmill Drive, with curb and gutter near the intersections.
St. John's Sideroad	Arterial Road	St. John's Sideroad runs in an east west direction with two lanes in each direction, and dedicated turning lanes at key intersections. The Barrie rail corridor crosses St. John's Sideroad east of Yonge Street at grade. The road has an urban cross section with curb and gutter, and a posted speed limit of 60 km/h.
Eagle Street	Primary Collector Road	Eagle Street runs in an east west direction within the Mulock study area and consists of a single lane in each direction and a center two way left turn lane. The roadway has an urban cross section with curb and gutter. There are sidewalks on both sides of the street. The posted speed limit is 50 km/h along most of the road in the Mulock study area, and is reduced to 40 km/h towards the eastern end of the Mulock study area.
Cane Parkway	Minor Collector Road	Cane Parkway is a four lane north south road which is divided by a raised median, providing access from Mulock Drive to several residential subdivisions and a local park to the north of Mulock Drive. The road is located to the west of the Barrie rail corridor and provides access to the Tom Taylor/Nokiidaa Trail. The roadway has an urban cross section with sidewalk on both sides at the southern end of the road. Parking is not permitted along the roadway. The posted speed limit is 40 km/h.

3.12.6 Innisfil GO Station

The existing transportation system includes the Town of Innisfil road network, and transit and active transportation facilities. The existing on-street parking facilities and property access points within the Innisfil study area were documented to be able to identify any potential effects

of construction or operation of the GO Station. Public transit is addressed in Section 2.7.6 of this EPR Addendum.

The existing road network within the Innisfil study area is comprised of major and minor arterial and collector roads as listed below (Town of Innisfil, 2013b). These are shown in Table 3-39.

Table 3-39: Innisfil GO Station Road Classification

Road	Classification	Description
20th Sideroad	Arterial Road	20th Sideroad is a two lane, north-south road within the Innisfil study area, that is designated as an Arterial Road in the Town of Innisfil OP (2011). The road currently has a rural cross section with paved shoulders. There are no sidewalks or cycling facilities on either side of the road. The posted speed limit is 80 km/h within the Innisfil GO Station study area.
Belle Aire Beach Road	Major Collector Road	Within the Innisfil study area, Belle Aire Beach Road is an east west road with a single lane in each direction. The road has a rural cross section with gravel shoulders on both sides. There are no sidewalks or cycling facilities present along Belle Aire Beach Road. The Barrie rail corridor crosses Belle Aire Beach Road at grade between 20th Sideroad and Maple Road. The posted speed limit is 60 km/h from 20th Sideroad to just east of the Barrie rail corridor crossing, where the posted speed limit decreases to 50 km/h until Maple Road.
6th Line	Major Collector Road	6th Line is a two lane, east west corridor between 20 Sideroad and St John's Road. The roadway has a rural cross section with gravel shoulders. There is a multi-use path on the north side of 6th Line from St. John's Road to east of the Barrie rail corridor crossing. The posted speed limit is 80 km/h.
7th Line	Major Collector Road	7th Line runs in an east west direction with a single lane in each direction, and dedicated left turning lanes at its intersection with 20 Sideroad. The road has a rural cross section with gravel shoulders on both sides. There are currently no sidewalks or cycling facilities along the road. The Barrie rail corridor crosses 7th Line between 20th Sideroad and Webster Boulevard at grade. The posted speed limit is 80 km/h from 20th Sideroad to just west of the Barrie rail corridor crossing where it decreases to 50 km/h until St. Johns Road.
St Johns Road/Maple Road	Major Collector Road	St. Johns Road/Maple Road is a two-lane road running in a generally north south direction between 7th Line and 5th Line. The road has a paved shoulder on both sides of the road, with the paved shoulder on the west side serving as a multi-use path. The posted speed limit on this road is 50 km/h.
Webster Boulevard	Major Collector Road	Webster Boulevard runs in a north south direction within the Innisfil study area and currently terminates approximately 670 metres

Road	Classification	Description
		south of 7th Line. The road consists of a single lane in each direction and has an urban cross section with curb and gutter. The existing surface width of paved road along Webster Boulevard is greater than 14 metres. There are sidewalks on both sides of the road up to its termination point. The Town of Innisfil Traffic By-Law (1513-2011) prohibits cycling on sidewalks (Town of Innisfil, 2017e).

3.12.7 Traffic Operations

Turning Movement Count (TMC) information at each of the key intersections identified in all study areas were obtained from their municipalities, and supplemented with additional data collected by Spectrum Traffic. The traffic volume data was collected in the A.M. and P.M. peak hours. The TMC information is summarized in Appendix I of Volume 2 through Volume 6 of this EPR Addendum. The data available is dated between 2015 and 2017. The traffic volumes were adjusted to represent existing 2017 traffic conditions by applying an annual growth rate. An annual growth rate of two percent was used to account for background traffic growth since there was insufficient data to calculate historical traffic growth.

Queuing assessment information for all intersections within the GO Station study areas is summarized in Appendix I of Volume 2 through Volume 6 of this EPR Addendum.

3.12.7.1 Spadina-Front GO Station

As a Transportation Brief was completed in lieu of executing a full TTIA, these details are not available.

3.12.7.2 Bloor-Lansdowne GO Station

Signalized intersections in the Bloor-Lansdowne study area perform at LOS D or better under existing conditions during the weekday A.M. and P.M. peak hours, with some movements approaching or operating at capacity.

Unsignalized intersections and movements in the Bloor-Lansdowne study area generally operate well, with the following noted exceptions:

- Bloor Street West and Perth Avenue:
  - Minor street stop-controlled approaches are operating with lengthy delays in the P.M. peak hour due to heavy east-west volumes on the major street.
- Symington Avenue and Wallace Avenue:
  - The northbound and southbound movements are operating at LOS E in the P.M. peak hour due to heavy demand at the northbound and southbound approaches.
- Lansdowne Avenue and Paton Road:
  - Minor street stop-controlled approached are operating with lengthy delays in both the A.M. and P.M. peak hours due to heavy north-south volumes on the major street.

3.12.7.3 Kirby GO Station

Most intersections in the Kirby study area perform at LOS D or better under existing conditions during the weekday A.M. and P.M. peak hours, with only one or two critical movements. However, several individual intersections have multiple critical movements and are approaching capacity due to high traffic demand. Key intersections with multiple movements approaching capacity in the Kirby study area include:

- Keele Street and Teston Road:
  - Multiple movements operating at LOS E or F in the A.M and P.M. peak hours due to heavy demand at the intersection.
- Dufferin Street and King Vaughan Road:
  - Multiple movements operating at LOS E in the A.M peak hour due to heavy demand at the intersection.

Unsignalized intersections and movements in the Kirby study area generally operate poorly, due to heavy conflicting traffic volumes:

- Jane Street and Kirby Road:
  - The stop-controlled eastbound and westbound movements operate with lengthy delays during the A.M. and P.M. peak hours due to heavy conflicting northbound and southbound traffic volumes; and
  - It is noted that this intersection was signalized on October 24th, 2017. However, data collection of traffic volumes was undertaken on January 26th, 2017, prior to signalization, thus analysis reflects pre-signalization conditions. Signalization of this intersection is taken into account in the analysis of future conditions.

3.12.7.4 Mulock GO Station

Most intersections in the Mulock study area perform at LOS D or better under existing conditions during the weekday A.M. and P.M. peak hours, with only one or two critical movements. However, several individual intersections have multiple critical movements and are approaching capacity due to high traffic demand. Key intersections with multiple movements approaching capacity in the Mulock study area include:

- Mulock Drive and Yonge Street:
  - Multiple movements are operating at LOS E in both the A.M. and P.M. peak hours due to heavy demand at the intersection.
- Yonge Street and St. John's Sideroad:
  - Multiple left turn movements are operating at LOS E and F in both the A.M. and P.M. peak hours due to heavy demand, despite provision of dedicated left-turn signal phases.
- Mulock Drive and Bayview Avenue:

- Multiple movements are operating at LOS E and F in both the A.M. and P.M. peak hours due to heavy demand at all approaches.

- Mulock Drive and Fernbank Road/College Manor Drive:
  - Multiple movements are operating at LOS E and F in both the A.M. and P.M. peak hours due to heavy demand at the eastbound and westbound approaches.
- Mulock Drive and Leslie Street:
  - Multiple movements are operating at LOS E and F in both the A.M. and P.M. peak hours due to heavy demand at all approaches.

Unsignalized intersections and movements in the Mulock study area generally operate well, with the following noted exceptions:

- Bayview Avenue and Penrose Street/Bondi Avenue:
  - Minor street stop-controlled approaches are operating with lengthy delays due to heavy north-south volumes on the major street.
- Willowick Drive and Mulock Drive:
  - The northbound left at the unsignalized approach is operating at LOS E due to heavy eastbound-westbound volumes on the major street. However, the intersection remains operational due to low demand at this intersection.

3.12.7.5 Innisfil GO Station

Signalized and unsignalized intersections perform at LOS B or better under existing conditions under the A.M. and P.M. peak hours, with no movement worse than LOS D.

4. Impact Assessment of the Preferred Design

4.1 Methodology

The impact assessment of the GO Stations has been developed based on the analysis and results of discipline-specific environmental studies documented in the following reports which are located in the noted appendices to this EPR Addendum (each GO Station is assembled as Volume 2 through Volume 6, with the Technical Reports in the following order within each GO Station volume):

- Appendix A – Initial Preferred Design (Spadina-Front GO Station) or Preferred Design (Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations);
- Appendix B – Natural Environment Report;
- Appendix C – Tree Inventory Plan;
- Appendix D – Stage 1 Archaeology Assessment;
- Appendix E – Cultural Heritage Studies;
- Appendix F – Socio-Economic and Land Use Study;

- Appendix G – Air Quality Impact Assessment;
- Appendix H – Noise and Vibration Impact Assessment; and
- Appendix I – Transportation and Traffic Impact Analysis (Transportation Brief only for Spadina-Front GO Station).

The impact assessment of the GO Stations in this EPR Addendum is structured according to the following aspects and Project components:

- Climate Change; and
- New GO Stations.

Potential effects and their corresponding recommended mitigation measures, monitoring activities, and anticipated net effects have also been organized in this EPR Addendum by the following categories:

- Affected environment (i.e., Natural Environment, Cultural Environment, Social and Built Environment);
- Affected feature (i.e., Wildlife, Terrestrial Habitat, Aquatic Habitat, Significant Natural Areas, etc.); and
- Project phase (i.e., pre-construction land clearing/property acquisition, construction, operations and maintenance).

Technical studies only considered project phases that have the potential to impact their field of study. Pre-construction land clearing/property acquisition was only considered for the following technical studies: NERs and SELUS'.

As PTE requests for the properties outside the Barrie rail corridor were not granted at the time of field visits, these lands will be assessed at a later date once Metrolinx has secured the required PTEs and during the next appropriate field season (i.e., during leaf-on), prior to construction.

The analysis and recommendations summarized herein are based on conservative assumptions regarding potential effects that could occur because of the GO Stations. They are also based on information available at the time of the TPAP. During the detailed design phase of the GO Stations, more information will be known about how the GO Stations may affect the natural, cultural or social/built environments. As such, recommendations shall be reviewed and updated as necessary prior to the construction phase of these GO Stations.

4.2 Climate Change

This section outlines how climate change considerations were taken into account in the environmental assessment and design of the Project. The following sections describe how the TPAP for GO Stations incorporates the MOECC's guidance for considering climate change in EAs, with a focus on climate change *mitigation* and *adaptation*, as summarized in Table 4-1 and Table 4-2.

The stations will be constructed and operated with future climate change projections in mind, so construction delays and service interruptions due to extreme weather events will be minimized.

The Intergovernmental Panel on Climate Change (IPPC) defines climate change as:

> "…a change in the state of the climate that can be identified (i.e., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use." (IPPC, 2014)

The term "climate change" can apply to any major variation in temperature, wind patterns or precipitation that occurs over time. Changes in the composition of the atmosphere are resulting in processes that alter global temperature and precipitation, and are affecting local weather patterns. These processes can ultimately lead to increased occurrence of extreme weather events such as floods, droughts, ice storms and heat waves across the GTHA (Metrolinx, Planning for Resiliency: Towards a Corporate Climate Adaptation Plan, 2017d).

To mitigate climate change and the effects it can have on the natural and built environments, government agencies at all levels have developed strategies and guidelines to reduce Greenhouse Gas (GHG) emissions into the atmosphere. Government agencies are also implementing measures that promote resiliency to a changing climate. Consistent with these strategies and guidelines, the planning and design of the Project will consider both climate change *mitigation* (i.e., minimizing effects of a project on climate change) and *adaptation* (i.e., resilience of a project to future climatic changes).

Section 4.2.1 outlines the policy context which guides how climate change has been considered in the planning of this Project. Given the relatively small effects of the Project on climate change, and Metrolinx's extensive existing guidance on how to build and operate the stations considering future extreme weather events, reference to existing climate change strategies and policies was judged to be sufficient in considering climate change in the TPAP.

Sections 4.2.2 (mitigation) and Section 4.2.3 (adaptation) describe how these considerations are being implemented in project planning and design.

4.2.1 Policy Context

4.2.1.1 Government of Ontario

The Government of Ontario has committed to reducing GHG emissions to 80 percent below 1990 levels by 2050 and has established two mid-term targets: 15 percent below 1990 levels by 2020 and 37 percent below 1990 levels by 2030 (Government of Ontario, 2015). To achieve these targets, the government has developed a Climate Change Strategy (Government of Ontario, 2015) and Climate Change Action Plan (Government of Ontario, 2016) which outline the following five areas of focus:

- A prosperous low-carbon economy with world-leading innovation, science and technology;

- Government collaboration and leadership;
- A resource-efficient, high-productivity society;
- Reducing GHG emissions across sectors; and
- Adapting and thriving in a changing climate.

The *Infrastructure for Jobs and Prosperity Act*, 2015 indicates that infrastructure should be planned to mitigate effects on climate change and be designed to consider climate change adaptation. Specifically, Section 3.11 of this Act states that:

> "*Infrastructure planning and investment should minimize the impact of infrastructure on the environment and respect and help maintain ecological and biological diversity, and infrastructure should be designed to be resilient to the effects of climate change.*"

The 2014 Provincial Policy Statement (PPS) (MMA, 2014) issued under the PA advises on the need to consider reducing GHG emissions and reducing the potential risk of climate change-related events like droughts or intense precipitation. It encourages green infrastructure and strengthened SWM requirements; energy conservation and efficiency; reduced GHG emissions; climate change adaptation (i.e., tree cover for shade and for carbon sequestration); and consideration of the increased risk associated with natural hazards (i.e., flooding due to severe weather).

Applicability to the Project

Improving the public transit network can reduce traffic congestion and reduce the need for new road infrastructure, as well as reduce carbon emissions and air quality concerns associated with automobile use, contributing to reductions in GHG emission and helping to achieve provincial targets. Metrolinx is working in alignment with the spirit of the *Infrastructure for Jobs and Prosperity Act*, 2015 in the planning and design of the Project.

Since the Project will be operational for the foreseeable future, there is a need to consider both their operational impacts to climate change, as well as how they will be affected by future climate change-related events such as droughts or intense precipitation. This includes consideration of most of the aspects highlighted in the PPS, including: green infrastructure; SWM; energy conservation and efficiency; GHG emissions; vegetation/carbon sequestration; and resiliency to natural hazards such as flooding. Specific measures related to these aspects are further discussed in Sections 4.2.2 and Section 4.2.3.

4.2.1.2 Ministry of the Environment and Climate Change

The MOECC has prepared a guide titled *Considering Climate Change in the Environmental Assessment Process* (MOECC, 2017), to describe how EA processes can incorporate consideration of climate change impacts, including:

- The effects of a project on climate change;
- The effects of climate change on a project; and
- Various means of identifying and minimizing negative effects during project design.

Considering climate change in accordance with the guide is meant to result in a project that is more resilient to future changes in climate and helps maintain the ecological integrity of the local environment in the face of a changing climate.

The guide states that proponents should take into account climate change mitigation and adaptation during both the assessment of *alternatives to the undertaking* and *alternative methods of implementing the undertaking*. Specific to transit projects assessed under the TPAP, the guide advises that the consideration of climate change should be scaled to the significance of the project's potential environmental effects, and that evaluation can be qualitative and/or quantitative.

Applicability to the Project

The TPAP starts with a selected transit project. The regulation does not require proponents to look at the rationale and planning alternatives or alternative solutions to public transit or the rationale and planning alternatives or alternative solutions to the particular transit project (MOE, 2014). The climate change assessment contained in this EPR Addendum focuses on the various design and mitigation measures that will support climate change mitigation and adaptation during construction and operations of the Project.

Overall, the Project's effects on climate change (i.e., mitigation) are expected to be small. There will be insignificant GHG emissions resulting from both construction and operations, as detailed in the AQIAs completed for the Project (see Appendix G within Volumes 2 to 6 of this EPR Addendum). The AQIAs involved a high-level quantitative analysis of local GHG emissions during operations, comparing GO Station emissions to Provincial targets.

Since the Project will be operational for the foreseeable future, it will likely be affected by future climate change-related events such as droughts or intense precipitation. As a result, the GO Stations need to be designed and operated with these future events in mind. The Project will continue to take climate change considerations into account as the design progresses.

Table 4-1 outlines how climate change was considered in this TPAP. Each of the areas considered is described in greater detail in Section 4.2.2 and Section 4.2.3.

Table 4-1: Consideration of Climate Change Prior to EPR and Addendum and in the TPAP Phase

Consideration	Project Phase	Areas Considered	Type of Evaluation
Effects of the Project on climate change (mitigation)	Prior to EPR Addendum, detailed design, construction, operations	Planning for transit	Qualitative
		GHG emissions	Quantitative
		Vegetation compensation and revegetation	Qualitative
		Energy consumption and emissions	Qualitative
Effects of climate change on the Project (adaptation)	Detailed design, construction, operations	Air temperature	Qualitative
		Precipitation	Qualitative
		Drought	Qualitative

Further, Table 4-2 outlines how the primary expectations for proponents when considering climate change according to the MOECC's guide (as indicated by "should" statements in the guide) have been addressed in the EPR Addendum.

Table 4-2: Consideration of Climate Change Prior to EPR Addendum and in the TPAP Phase

Recommendation	Section(s)
The ministry expects proponents to take into account: • The project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation) • Resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation)	• Section 4.2.2.2 (greenhouse gas emissions) • Section 4.2.2.3 (impacts on carbon sinks) • Section 4.2.3 (climate change adaptation)
The proponent should also include a discrete statement in their study report detailing how climate change was considered in the EA.	• Section 4.2.1.2 • Table 4-1
Proponents of natural resource related projects should consult Appendix B for treatment of carbon stocks as sinks versus sources.	The Project is not natural resource related, so this is not applicable.
Proponents should include evaluation criteria, such as greenhouse gas emissions and impacts on carbon sinks, in the assessment of alternatives and alternative methods.	The TPAP does not include an assessment of alternatives or alternative methods, so this not applicable.
In concluding an environmental assessment study, the proponent should also include a statement in their study report about how climate change was considered in the environmental assessment and how the preferred alternative (project) is expected to perform with climate change considered.	• Section 4.2
Proponents should include evaluation criteria such as extreme weather events in their screening of alternatives, and alternative methods.	The TPAP does not include an assessment of alternatives or alternative methods, so this not applicable.
Proponents should also include in their study report, a statement about how climate change was considered in the EA, specifically in relation to the preferred alternative (project).	The TPAP does not include an assessment of alternatives or alternative methods, so this not applicable.
All climate parameters with potential to interact with a project should be defined and considered at a screening level to fully understand which interactions pose higher risk.	• Section 4.2.3 • Table 4-3
Proponents should also document any uncertainty related to either downscaling climate change projections to specific sites, or expected impacts to the environment or project, within the EA.	Metrolinx is moving towards using downscaling projections as described in its *Planning for Resiliency* report (Metrolinx, Planning for Resiliency: Towards a Corporate Climate Adaptation Plan, 2017) to inform decisions regarding planning, construction and operations of infrastructure. This considers adaptation to climate change across all

Recommendation	Section(s)
	infrastructure assets, including existing and future stations.
Considering climate change in the terms of reference for an EA should commit the proponent to considering climate change impacts in related project studies prepared in support of the EA report.	The TPAP does not include a terms of reference, so this is not applicable.
Considering climate change in an EA should result in the proponent refining and documenting measures for dealing with climate change impacts as the undertaking moves toward implementation stage. Examples could include adapted design or maintenance schedules, additional studies, and revised operating procedures.	• Section 4.2.3.2.1
Considering climate change in streamlined EA processes and studies could result in the inclusion of a commitment on how the proponent will implement climate change adaptation and mitigation measures during the detailed design phase of any given project.	• Section 4.2.2.3 • Section 4.2.3.2
Proponents should consider whether making reference to existing climate change strategies or policies alone is sufficient as a consideration of climate change, or whether a more detailed consideration of climate change should be carried out when conducting project-specific environmental assessment studies. Documentation of the results of this consideration should be included as part of project reporting.	• Section 4.2

4.2.1.3 Metrolinx

Metrolinx's draft RTP outlines the long-term projects, plans, and activities Metrolinx will deliver to support reduction of Ontario's overall GHG emissions by promoting a shift from single occupant vehicles to more energy-efficient options like public transit, walking, cycling, carpooling, and teleworking (Metrolinx, 2018b).

Metrolinx is committed to ensuring that the existing transit network and new transit facilities/infrastructure will have a low-carbon footprint[13] and contribute to a clean and healthy environment for future generations (Metrolinx, 2016b). Metrolinx has outlined key climate change goals in its Sustainability Strategy (2015 – 2020) (Metrolinx, 2016b). The Sustainability Strategy addresses climate change through five goals, which are:

- Goal 1: Become Climate Resilient – Accelerate and intensify our efforts to implement a climate adaptation and resilience program to manage and mitigate climate change risks.
- Goal 2: Reduce Energy Use and Emissions – Adopt processes, programs and technologies that allow us to effectively track, monitor and reduce our energy consumption, and carbon and air emissions.
- Goal 3: Integrate Sustainability in our Supply Chain – Minimize the impact associated with the use, extraction, processing, transport, maintenance, and disposal of materials and

[13] *A carbon footprint is the total greenhouse gas emissions attributed to a body (i.e., person, facility, or event) expressed as CO_{2e}. CO_{2e} is a standard unit for measuring carbon footprints, as a way to express the impact of each different greenhouse gas in terms of the amount of CO_2 that would create the same amount of warming.*

integrate sustainability criteria into our vendor management decisions. This goal extends to consideration of embodied carbon (i.e., the carbon dioxide emitted during the manufacture, transport and construction of materials, together with end of life emissions).

- Goal 4: Minimize Impacts on Ecosystems – Consider the impact of infrastructure and services on ecosystems and ecosystem services and make best efforts to manage, preserve and protect. This includes the consideration of infrastructure projects within the broader context of ecosystems and ecological values, including watershed/SWM considerations.
- Goal 5: Enhance Community Responsibility – Leverage our significant investment in the region to create a lasting legacy for our communities, and work closely with communities to create economic and social value.

For GO Stations, terminals, and facilities, including the Project, Metrolinx generally requires that contractors adhere to the DRM (Metrolinx, 2017c). The DRM outlines the Guiding Principles and technical details for designing and building GO infrastructure. The DRM covers a number of areas directly and indirectly related to climate change adaptation and mitigation, including SWM, energy consumption and emissions, and vegetation.

Also included in the DRM is how infrastructure should target Leadership in Energy and Environmental Design (LEED) credits to reduce GHG emissions, as per Canada Green Building Council standards.

Applicability to the Project

Of the goals identified above, Goals 1, 2, 3 and 4 line-up most directly with climate change adaptation and mitigation as described in the MOECC's guide. Goal 1 is focused on adaptation, and has been considered in various aspects of station design. Goals 2 and 3 relate to minimizing emissions during station construction and operations (mitigation), while Goal 4 focuses on minimizing impacts to ecosystems both during construction and operations (adaptation and mitigation). The following sections outline how project planning and design have been undertaken with regard to climate change mitigation and adaptation.

Goal 5 more broadly speak to how the construction and operations of the Project can maximize social and economic value, and is not addressed in this volume as it does not relate to climate change directly.

The DRM indicates that new stations will target LEED accreditation and credits, and indicates which credits are mandatory and which are optional depending on project specifics.

4.2.2 Considering the Effects of the Project on Climate Change (Climate Change Mitigation)

As indicated in Table 4-1, the effects of the project on climate change (mitigation) have been evaluated both quantitatively (for GHG emissions) and qualitatively (for transit planning, vegetation compensation/revegetation, and energy consumption/emissions).

4.2.2.1 *Planning for Transit*

Public transportation is a beneficial service that can reduce traffic congestion and reduce the need for new road infrastructure, as well as reduce carbon emissions and air quality concerns associated with automobile use. Improvements to transit will decrease average transit trip times in the GTHA, even with an increasing population, leading to more people using public transportation and fewer vehicle-kilometres travelled in congested conditions. This reduction in congestion, when combined with expected improvements in automobile fuel efficiency, will result in a decrease in per capita GHG emissions from automobile trips (Metrolinx, 2018b).

The Project has been identified for implementation through a comprehensive, iterative planning process for new stations in the GTHA. An initial set of 120+ potential station sites was refined to 12 new stations, including the five GO Stations, through a network-wide analysis that occurred prior to the TPAP. Business case analysis for the five GO Stations to date has indicated that benefits (travel time savings for new GO Station users, auto usage decrease) outweigh impacts (delays to upstream passengers, auto usage increase). Further information about the business cases for new GO Stations is provided in Section 1.2.5 and Section 1.2.6. It is anticipated that the introduction of these new GO Stations will promote the use of public transportation, thereby decreasing congestion and improving per capita GHG emissions.

4.2.2.2 *Greenhouse Gas Emissions*

GHG/Climate Change analyses were undertaken as part of the AQIA for each new GO Station, to evaluate the local impacts to air quality (see Appendix G of Volumes 2 to 6 of this EPR Addendum). The assessments considered combustion engines (from cars, buses and trains) accessing/passing by the GO Stations as the sources of emissions. Spadina-Front GO Station would not result in GHG emissions as there is no parking, buses, or PPUDO planned. The Bloor-Lansdowne GO Station would result in a very small increase in GHG emissions as a result of the lay-by at the GO Station. The Kirby, Mulock and Innisfil GO Stations would result in a small increase in GHG emissions as a result of intensification of traffic around the GO Stations. However, this increase is insignificant as total GHG emissions from the Full-Build Scenario will be trivial compared to the 2020 Provincial Target.

Table 4-3 below summarizes the findings for the five GO Stations.

Table 4-3: Anticipated GHG Contributions of GO Stations Compared to 2020 Provincial Target

GO Station	CO_{2eq} Emissions from operations (tonnes/day)	% of 2020 Provincial Target (166 Mt/year)
Spadina-Front GO Station	N/A	N/A
Bloor-Lansdowne GO Station	0.08	<0.0001
Kirby GO Station	2.03	0.000446
Mulock GO Station	2.36	0.000519
Innisfil GO Station	0.76	0.000167

While there are minimal anticipated GHG emissions associated with operation of the Project, an overall decrease in GHG emissions is predicted due to reduction in vehicles commuting, replaced by trains carrying more passengers. This expected decrease is qualitative since predicting the final destination of cars is not currently feasible with available data sources.

4.2.2.3 Vegetation Compensation and Revegetation

As noted in the TIPs (Appendix C in Volumes 2 to 6 of this EPR Addendum), the construction of the GO Stations will require the removal of trees and vegetation, which will result in a temporary loss of an existing carbon sink within the local environment.

Metrolinx is establishing a Vegetation Compensation Protocol for RER projects that will be applied to the Project, and vegetation that is removed will be compensated for in accordance with the provisions of this protocol, as stated in Section 4.3.2 of this EPR Addendum.

Revegetation of disturbed areas will take place as soon as possible. Post-planting monitoring of restoration areas will occur for one year after installation. One site visit will be conducted during the subsequent growing season to confirm survival of plantings and/or seed mix. Should the plantings and/or seed mix not survive, additional seeding and/or plantings will be undertaken one year thereafter with one additional monitoring visit in the following growing season.

Additionally, the DRM requires that plant materials suitable to the growing environment at project sites be selected for vegetation/revegetation, and that species (native or non-native) must be hardy, drought and salt-tolerant, and resistant to the stresses of compacted soils and weather exposure.

4.2.2.4 Energy Consumption and Emissions

Through the DRM, Metrolinx targets LEED credits that reduce GHG emissions and improve energy performance and refrigerant management[14]. Specifically, the DRM directs that the GO Stations are designed to reduce energy consumption and emissions by considering measures such as:

- Applying passive means of reducing energy where it does not conflict with other customer service and operational design requirements;
- Maximizing the use of natural light coupled with photocells, motion sensors and controls to activate lighting when necessary (enhanced building automation controls). where it does not conflict with other customer service and operational design requirements;
- Using LED lighting; and
- Using heat recovery to conserve energy for heating and cooling.

4.2.3 Considering Potential Effects of Climate Change on the Project (Climate Change Adaptation)

It is recognized that climate change is already underway and can be anticipated to affect the construction and operations of the Project. There is general agreement that the Great Lakes Basin will see increases in temperature, precipitation, drought, wind gust events, and freezing

[14] *Some air-conditioning refrigerants are powerful GHGs.*

rain by the end of this century; however, the level of confidence and quality of supporting evidence for these projections vary considerably (Metrolinx, Planning for Resiliency: Towards a Corporate Climate Adaptation Plan, 2017d). Table 4-4 shows the current consensus predictions for climate change in the Great Lakes Basin.

Table 4-4: Climate Change Projections for the Great Lake Basin[1]

Theme	General projections	Trend	Data Confidence
Air temperature	• 1.5ºC-7ºC increase by 2080s depending on climate scenario and model used • Greater increases in the winter • Increased frost-free period and growing season	↑	High evidence High agreement
Precipitation	• 20 percent increase in annual precipitation across the Great Lakes Basin by 2080 under the highest emission scenario • Increases in rainfall, decreases in snowfall • Increased spring precipitation, decreased summer precipitation • More frequent extreme rain events	↑	High evidence Medium agreement
Drought	• Projected increases in frequency and extent of drought	↑	Low evidence High agreement
Wind	• Increased wind gust events	↑	Low evidence Low agreement
Ice storms	• Greater frequency of freezing rain events	↑	Low evidence Low agreement

[1]*Source: (McDermid, et al., 2015)*

To focus the consideration of effects of climate change on the Project, only those themes where there is high or medium agreement on data (i.e., air temperature, precipitation, and drought) are addressed in the sections below, for both the construction and operations phases of the Project.

4.2.3.1 Air Temperature

Recognizing increasing summer temperatures, the DRM considers reducing effects of extreme heat on riders and the GO Station. Specifically, the DRM indicates that GO Station design will:

- Consider building material selection to limit absorption of solar radiation;
- Maximize shade along pedestrian routes; and
- Reduce the urban heat island effect through plantings, selection of building materials and proactive shade management.

4.2.3.2 Precipitation

Precipitation, whether it is rainfall, snowfall, or other forms of frozen/liquid water, is the key climate and weather-related variable of concern in SWM. As a result of climate change, storm

events are predicted to become more intense in the GTHA, which can result in larger volumes of precipitation at one time (see (McDermid, et al., 2015) as outlined in Table 4-4).

4.2.3.2.1 Stormwater Management

The SWM design for the Project will consider the drainage and SWM objectives of the MOECC Stormwater Management Planning and Design Manual (2003), MTO Drainage Management Manual (2008), and TRCA Stormwater Management Criteria (2012), among other guidance. This will be supplemented by current guidance such as the runoff volume control targets for Ontario recommended to MOECC (Aquafor Beech Ltd. and Earthfx Inc., 2016) from local municipalities and conservation authorities.

A detailed SWM Plan will be developed prior to the construction phase of the Project so that runoff from rainfall is controlled based on predicted future scenarios, to promote climate resilience. Future increased rainfall intensities, and consequently increased runoff, will be predicted using precipitation Intensity-Duration-Frequency (IDF) curves, such as those found in the MTO IDF Curve Lookup Tool. These can be incorporated into the SWM design of the Project once the design life of the stations is determined.

Intensity-duration-frequency curves are graphical representations of the amount of water that falls within a given period of time in catchment areas, and are used by decision makers to plan and design infrastructure to withstand severe weather impacts (Office of the Auditor General of Canada, 2016). Current SWM practices include the use of IDF data and design storm distributions (i.e., Chicago Storm, Hurricane Hazel), as well as two-year through to 100-year[15] storm events.

Designing the SWM systems for the Transit Project using IDF curves will lead to:

- Reduced ongoing operation and maintenance requirements; and
- Minimized impacts on surrounding ecosystems, since SWM systems will be designed to ensure that runoff from rainfall is controlled mostly on-site.

Oil-grit separators[16] and stormwater management features must be sized appropriately to manage predicted future scenario flows and sediment loading (i.e. winter and spring).

4.2.3.2.2 Erosion and Sediment Control Measures

An increase in storm intensity, which is projected as a result of climate change (see Table 4-4), can make erosion and sedimentation more likely, especially during construction. Erosion and Sediment Control (ESC) measures including the development of an ESC Plan, will be implemented during the construction phase of the Project to ensure stormwater runoff is controlled and sediment is prevented from entering sewers and watercourses. The ESC Plan will include consideration of the GGHACA ESC Guidelines for Urban Construction (2006) for the Spadina-Front, Bloor-Lansdowne and Kirby GO Stations and the Technical Guidelines for

[15] Storm even frequency is used to simplify the definition of a rainfall event that statistically has a chance of occurring once within the given time period (i.e., a 100-year storm has a 1 in 100 (1%) probability of occurring in any given year.

[16] Oil grit separators are underground devices designed to protect waterways from hazardous material spills and stormwater pollution.

Stormwater Management Submissions (LSRCA, 2016) for the Mulock and Innisfil GO Stations. Installation and monitoring of appropriate ESC measures will help mitigate potential effects of climate change on the Project.

4.2.3.3 Drought

As summarized in Table 4-4, the Great Lakes Basin is projected to see increases in frequency and extent of drought. GO Station design, in pursuit of LEED certification as required by the DRM, will include consideration of water conservation measures to reduce effects of drought on the Project, such as:

- Metering indoor and outdoor water use to better track and manage the impacts of extended droughts on operations and landscape plantings;
- Using water conserving systems to reduce consumption; and
- Planting drought resistant vegetation.

4.3 GO Stations Effects Assessment

4.3.1 Wildlife, Terrestrial Habitat, Aquatic Habitat, and Significant Natural Areas

4.3.1.1 Potential Effects

Pre-Construction/Land Clearing – All GO Stations

Significant Natural Areas:

- Spadina-Front GO Station – No Significant Natural Areas are present within the Spadina-Front study area. There is a small (0.09 ha) piece of Mineral Cultural Meadow ELC community within the Spadina-Front GO Station footprint, however there are no predicted effects for this piece of land.
- Bloor-Lansdowne GO Station – No Significant Natural Areas are present within the Bloor-Lansdowne study area, although the Bloor-Lansdowne GO Station will involve the removal of 3.63 ha of ELC communities as a result of the GO Station. A total of 0.79 ha of the ELC to be removed is RNFP area located within the north study area associated with the Earlscourt Park MUP bridge. Additionally, the ELC communities to be removed are comprised of the following:
  - 0.48 ha of Dry-Moist Old Field Meadow;
  - 0.48 ha of Green Lands;
  - 1.75 ha of Mineral Cultural Thicket;
  - 0.12 ha of Cultural Thicket;
  - 0.14 ha Dry-Fresh Exotic Deciduous Forest; and
  - 0.04 ha of Business Sector.
- Kirby GO Station – Significant Natural Areas including, PSWs and Significant Woodlands, are present within the Kirby study area. Although these areas will not be removed, they may be affected by adjacent land clearing. The Kirby GO Station will involve the removal

of 8.12 hectares (ha) of ELC communities. The ELC communities to be removed are comprised of the following:

- 7.8 ha of Intensive Agriculture;
- 0.2 ha of Cultural Meadow; and
- 0.12 ha of Deciduous Forest.

- Mulock GO Station – It is anticipated that portions of unevaluated wetlands and Significant Valleylands will be lost as a result of the Mulock GO Station. The Mulock GO Station will also involve the removal of 1.07 hectares (ha) of ELC communities. The ELC communities to be removed are comprised of the following:
  - 0.9 ha of Cultural Meadow; and
  - 0.17 ha of Meadow Marsh.
- Innisfil GO Station – No Significant Natural Areas are present within the Innisfil study area, although the Innisfil GO Station will involve the removal of 7.11 hectares (ha) of Intensive Agricultural ELC communities as result of the GO Station.

Wildlife Habitat:

- Spadina-Front GO Station – No Candidate or Confirmed SWH are located within the Spadina-Front study area;
- Bloor-Lansdowne GO Station – No Candidate or Confirmed SWH are located within the Bloor-Lansdowne study area;
- Kirby GO Station – Portions of Significant and Candidate SWH and Habitat for SCC may be removed. Several SWH types could not be verified in the Kirby study area due to limited property access. These include: reptile hibernacula; rare vegetation communities; and seeps and springs;
- Mulock GO Station – Portions of Significant and Candidate SWH and Habitat for SCC will likely need to be removed. Most of the wildlife habitats overlap with natural areas (unevaluated wetlands, and Significant Valleylands). Several SWH types could not be verified in the Mulock study area due to limited property access. These include: reptile hibernacula, rare vegetation communities, and seeps and springs; and
- Innisfil GO Station – No Candidate or Confirmed SWH are located within the Innisfil study area.

Species at Risk:

- Spadina-Front GO Station – Areas identified as Candidate or Confirmed Habitat of Endangered and Threatened Species have been identified within the Spadina-Front study area;

- Bloor-Lansdowne GO Station – No areas identified as Candidate or Confirmed Habitat of Endangered and Threatened Species have been identified within the Bloor-Lansdowne study area;
- Kirby GO Station - Areas identified as Significant and Candidate Significant Habitat of Endangered and Threatened species may be cleared. Removal of this habitat may be subject to the ESA which prohibits the killing, harming, or harassing of Endangered and Threatened Species and the destruction of their habitats;
- Mulock GO Station – Areas identified as Significant and Candidate Significant Habitat of Endangered and Threatened species may be cleared. Removal of this habitat may be subject to the ESA which prohibits the killing, harming, or harassing of Endangered and Threatened Species and the destruction of their habitats; and
- Innisfil GO Station – Candidate SAR habitat within the Innisfil study area could potentially be cleared. These areas may provide habitat function, but their significance has not been confirmed.

If SAR habitat is identified within the GO Station study areas as part of additional (future) field investigations, removal of this habitat may be subject to the ESA which prohibits the killing, harming or harassing of Endangered and Threatened species and destruction of their habitats.

Nests of Migratory Birds:

Clearing of trees, shrubs and ground vegetation for all GO Stations has the potential to destroy or disturb nests of migratory birds which are protected under the MBCA.

Construction – All GO Stations

Significant Natural Areas, Wildlife Habitat and Species at Risk: All SCC habitat, and Endangered and Threatened Species habitat, could be affected during construction at all GO Stations as follows:

- Grading and soil disturbance during construction can lead to erosion and sedimentation within natural features and areas. This can affect the quality of habitat and disturb ground vegetation, thereby adversely affecting wildlife habitat;
- Stockpiled materials, equipment or construction activities could accidentally encroach into and disturb natural features and areas beyond the GO Station footprints. Additionally, soils beyond the GO Station footprints could also become compacted or disturbed if activities were to extend beyond the GO Station footprints;
- There is potential for spills of fuels or other hazardous materials to occur during fueling of construction equipment or other construction activities. This can potentially affect the health of vegetation and wildlife within natural areas;
- Disturbance to lands and vegetation clearing has the potential to introduce and allow for the spread of invasive species through natural areas. Invasive species can prevent other native species from becoming re-established;

- Tunnel construction will require dewatering and the discharge of extracted water to the environment. Dewatering may be required for other sub-surface work;
- The development of the GO Stations will result in an increase of impermeable surface, which may lead to increased stormwater runoff. Further, the development has the potential to affect the existing water balance of the wetlands, woodlands and watercourses within the GO Station study areas;
- Dust created as a result of construction has the potential to settle on adjacent vegetation, disturbing wildlife and their habitat; and
- Noise, vibration and lighting associated with the construction of the GO Stations has the potential to affect sensitive flora and fauna, and the quality of their habitat.

Significant Valleylands:

- Spadina-Front, Bloor-Lansdowne, Kirby and Innisfil GO Stations – No potential effects are anticipated to Significant Valleylands during construction as none have been identified in those study areas; and
- Mulock GO Station – The Significant Valleyland associated with the Mulock study area could be disturbed by vegetation removal, grading work and the movement of large equipment. This could result in erosion, slumping or slope failure.

Fish Habitat:

- Spadina-Front, Bloor-Lansdowne and Innisfil GO Stations – No potential effects are anticipated to Fish Habitat during construction as no watercourses have been identified in those study areas; and
- Kirby and Mulock GO Stations - The Kirby and Mulock GO Station construction carried out in, and around, water may potentially cause harm to fish.

Wellhead Protection Areas:

- Spadina-Front, Bloor-Lansdowne, Kirby and Innisfil GO Stations - The Spadina-Front, Bloor-Lansdowne, Kirby and Innisfil GO Station study areas are not located within a WHPA-D;
- Mulock GO Station:
  - Though the study area is located within a WHPA-D, transportation infrastructure is not subject to Source Water Protection regulations as it is unlikely to cause negative effects. Threats are defined by the occurrence of these activities under specific conditions that include location, volume of chemicals involved, method of storage, etc. Based on the list of the activities and the circumstances required for a threat occurrence, there are no activities related to the construction of the GO Station that are anticipated to meet the criteria to be considered a source protection threat. As a result, no source water protection regulations will apply to this GO Station. However, there is potential for spills of fuels or other hazardous materials to occur during fueling

of construction equipment or other construction activities, which can affect ground water quality.

Operations and Maintenance – All GO Stations

Significant Natural Areas, Wildlife Habitat and Species at Risk: All SCC habitat and Endangered and Threatened Species habitat could be affected by operation activities at all GO Stations, as follows:

- Grading or earth moving required for maintenance purposes can result in erosion and sedimentation within adjacent natural features and areas, degrading habitats and harming vegetation and wildlife;
- Routine vegetation management practices carried out by Metrolinx for the safe operation of the Barrie rail corridor will be undertaken to keep the corridor ROW clear and free of any vegetation that could disrupt sight lines or interrupt the movement of train traffic. Trees adjacent to the rail ROW may need to be trimmed and new vegetation may need to be cleared. Trimming has the potential to harm healthy trees and allow disease or rot to expand. Use of chemical pesticides to maintain areas around the GO Stations also has the potential to affect groundwater and adjacent natural features and areas if not applied correctly; and
- Spills of fuel and/or application other hazardous materials (i.e., de-icing substances during winter months, pesticides, etc.) could occur as a result of maintenance activities. Spills have the potential to affect ground and surface water quality and kill or harm vegetation and wildlife.

Amphibian and Reptiles – Kirby GO Station:

- Amphibian and reptile injuries and mortalities associated with road crossings.

Wellhead Protection Areas:

- Spadina-Front, Bloor-Lansdowne and Innisfil GO Stations - The Spadina-Front, Bloor-Lansdowne and Innisfil GO Station study areas are not located within a WHPA;
- Kirby GO Station - A WHPA-Q was identified within the study area. Within areas classified as WHPA-Q activities that reduce recharge represent a water quantity threat; and
- Mulock GO Station – A WHPA-Q was also identified within the study area. Within areas classified as WHPA-Q activities that reduce recharge represent a water quantity threat.

4.3.1.2 Mitigation Measures

Pre-Construction/Land Clearing – All GO Stations

Significant Natural Areas: Mitigation regarding significant natural areas and natural areas within all study areas will be implemented as follows:

- Metrolinx is establishing a Vegetation Compensation Protocol for Metrolinx RER Projects and vegetation that is removed will be compensated for in accordance with the provisions of this protocol as described in Section 4.3.2.2.

Additional mitigation measures are as follows:

- Retain existing vegetation within the GO Station study areas to the extent practicable. Vegetation removal will be kept to a minimum, limited to within the construction disturbance area and should be scheduled to occur outside of the breeding bird timing window of April 1 to August 31 of any given year;
- Areas for vegetation removal will be refined during detailed design, if required (i.e., change in construction disturbance area, final staging areas);
- Detailed clearing, ESC Plans and Restoration Plans will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects and approved Landscape Plans will be developed prior to construction;
- Adhere to relevant OPSS for clearing and grubbing (OPSS 201), site preparation and tree protection (OPSS 801). When practicable, prune or top the vegetation instead of grubbing/uprooting, if required;
- All work zones will be clearly marked on detailed design drawings and the ESC Plan to indicate that no work will occur outside the work zone;
- All culverts, bridges and in-water structures will be designed to meet appropriate storm design requirements in order to avoid hydrologic affects;
- All construction laydown areas and easements will be located to avoid natural features (Candidate and Confirmed) to the extent possible;
- Where avoidance is not possible, vegetation removal will occur in accordance with the timing windows;
- All construction laydown areas and easements will be located to avoid natural features (Candidate and Confirmed) to the extent possible;
- Where avoidance is not possible, vegetation removal will occur in accordance with the timing windows; and
- Any construction laydown areas or easements located within the Candidate or Confirmed Habitat of Endangered or Threatened Species will be subject to applicable requirements under the ESA.

In wetlands – Kirby and Mulock GO Stations:

- Where possible a setback from all developments of between 30-120 metres from all PSWs will be maintained. Setback distance will be determined through impact and mitigation analysis of individual wetlands and wetland components. All impacts, mitigation and proposed setback measures will be discussed with the appropriate conservation authority (TRCA or LSRCA) and MNRF; and
- Hydrology is of central importance to the ecological health, function and value of wetlands. Changes to the water balance directly influence the chemical and physical properties of these features, and in doing so determine the diversity of flora and fauna that can be

present. Therefore, it is vital to preserve the water balance of wetlands to prevent detrimental changes resulting from development. Wetlands will be restored as necessary to maintain the stability and function of the wetland. Compensation measures will be determined in further consultation with the TRCA and MNRF.

In woodlands – Kirby GO Station:

- Applicable TPZs will be established in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects;
- Barriers will be installed around trees to be protected using material approved by the affected municipality; and
- No stockpiles, storage or disturbance to grade will occur within the TPZ to minimize soil compaction and root damage.

Wildlife Habitat: Where SAR was identified, and if SAR is identified during additional (future) field studies, mitigation measures for pre-construction land clearing will be implemented as follows:

- Where habitats could not be identified due to access restrictions (i.e., reptile hibernacula, rare woodlands, seeps and springs), preconstruction surveys will be conducted. Any significant findings will be reported to the applicable municipality and conservation authority, and compensation will be addressed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects;
- Any vegetation clearing shall take place outside of the breeding bird timing window, which is generally, from April 1 to August 31 of any given year (different windows may apply to habitats of SAR, subject to permitting requirements);
- If clearing must occur within this window a qualified Ecologist Ecologist/Avian Biologist will first search the affected area. Any active nests will be flagged and all clearing within the associated habitat will be avoided until the Ecologist/Avian Biologist confirms that the birds have fledged and the nest is no longer active;
- If a nesting migratory bird (or SAR protected under the ESA) is identified within or adjacent to the construction site, regardless of the timing window, all activities will stop and the Contractor (with assistance from a qualified Ecologist/Avian Biologist) will discuss mitigation measures with the Environmental Inspector. In addition, Metrolinx will contact the MNRF and Environment and Climate Change Canada (ECCC) to discuss applicable mitigation options. The Contractor will proceed based on the mitigation measures established through discussions with Metrolinx, the MNRF and/or ECCC; and
- Compensation measures for habitats located within Natural Areas where habitats do not coincide with a Significant Natural Area will be developed, as appropriate. Metrolinx will coordinate compensation with public agencies through the implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects.

Species at Risk: Mitigation measures to minimize effects to SAR during pre-construction land clearing activities will be implemented as follows:

- Detailed field surveys will be undertaken prior to Project construction by a qualified Ecologist to confirm the presence of the following species:
  - Spadina-Front GO Station - Peregrine Falcon; Common Nighthawk; Chimney Swift; and Barn Swallow;
  - Bloor-Lansdowne GO Station – Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Bank Swallow, Barn Swallow, Bobolink, Chimney Swift, Eastern Meadowlark, Eastern Hog-nosed Snake, and Butternut;
  - Kirby GO Station – Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Bank Swallow, Barn Swallow, Bobolink, Chimney Swift, Cerulean Warbler, Eastern Meadowlark, Jefferson Salamander and Butternut;
  - Mulock GO Station – Eastern Small-foot Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Bank Swallow, Barn Swallow, Bobolink, Chimney Swift, Eastern Meadowlark and Butternut; and
  - Innisfil GO Station - Little Brown Bat, Northern Myotis, Tri-coloured Bat, Bank Swallow, Barn Swallow Eastern Meadowlark, and Butternut.
- Findings of field surveys will be reported to the MNRF;
- With regards to Butternut trees, the following mitigation measures will be implemented:
  - Detailed field investigations will be undertaken prior to Project construction to confirm whether any additional Butternut trees of all sizes (including seedlings) are present within 25 metres from the Project footprint (50 metres for the Innisfil GO Station);
  - During the detailed design phase, the rail infrastructure will be designed to avoid the removal of Butternut trees to the extent possible;
  - Register habitat damage or tree removal and submit Butternut Health Assessment (BHA) to the MNRF. A BHA will be conducted for all Butternut trees that must be removed. All findings will be reported to the MNRF; and
  - Where loss of a retainable tree cannot be avoided, the MNRF will be contacted and all requirements under the ESA, 2007 will be met through the preparation of a Butternut Compensation Planting Plan.
- During the detailed design phase, construction (including pre-construction land clearing) will be designed to avoid the loss of any Confirmed Habitat of Endangered or Threatened Species to the extent possible. Where loss cannot be avoided, the MNRF will be contacted and all requirements under the ESA will be met, including any species-specific registration, compensation and/or permitting requirements;
- Timing windows for any necessary removal of any Confirmed Endangered or Threatened Species habitat will be developed in consultation with the MNRF in association with any self-registration or permitting requirement; and

- Should a SAR be encountered that is not identified on relevant permits, all work will cease within the immediate work area and the MNRF will be contacted.

Nest of Migratory Birds: Mitigation will be implemented as follows:

- Timing windows for tree and shrub removal that have been identified as part of the habitat of a SAR will be confirmed by the MNRF;
- To reduce the possibility of contravention of the MBCA, vegetation removal shall be scheduled to occur outside of the breeding bird timing window of April 1 to August 31 of any given year. Some birds may nest before and after this peak bird timing window due to annual seasonal fluctuations. Therefore, if a nest of a migratory bird is found within the construction area outside of this nesting period it shall still receive protection;
- If vegetation must be removed during the breeding bird timing window:
  - Nest and nesting activity searches will be conducted in areas defined as simple habitat[17] (i.e., the CUM1-1 community) by a qualified Ecologist/Avian Biologist no more than 24 hours prior to vegetation removal. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (Cadman *et al.,* 2007);
  - If an active nest or confirmed nesting activity of a migratory bird is observed in simple habitat, regardless of the timing window recommended, a species-specific buffer area following ECCC guidelines will be applied to the nest or confirmed nesting activity wherein no vegetation removal will be permitted until the young have fledged from the nest. The radius of the buffer will depend on species, level of disturbance and landscape context (MOECC, 2016) (Government of Canada, 2017b), which will be confirmed by a qualified Ecologist/Avian Biologist, but will protect a minimum of ten metres around the nest or nesting activity; and
  - The results of all nest searches will be documented at the end of each survey day in a Technical Memorandum, including information on the searcher, date, time conducted, weather conditions, habitat type, vegetation community type, observations of breeding activity, observations of confirmed nests including co-ordinates, and, if required, the buffer applied to identified breeding/nesting sites.
- If vegetation removal must occur in complex habitats within the above-listed timing windows and absolutely cannot be avoided, the same BMPs such as nest and nesting activity searches described above will be undertaken.

[17] *Simple habitat refers to habitat that contain few nesting spots or few species of migratory birds, where identification of active nests or confirmed nesting activity can be completed with confidence. According to ECCC (MOECC, 2016) (Government of Canada, 2017b), examples of simple habitat include the following:*

- *Urban parks consisting mostly of lawn with a few isolated trees;*
- *Vacant lot with few possible nest sites;*
- *Previously cleared area where there is a lag between clearing and construction activities (and where ground nesters may have been attracted to nest in cleared areas or in stockpiles of soil); or*
- *Structure such as a bridge, beacon, tower or building (often chosen as a nesting spot by robins, swallows, phoebes, nighthawks, gulls and others).*

- Suitable human-made structures within the GO Station study areas should be inspected for evidence of active bird nests during the breeding bird timing window prior to the onset of construction activities in order to determine appropriate nesting preventative measures (i.e., netting); and
- Compensation measures for habitats located within Natural Areas where habitats do not coincide with a Significant Natural Area will be developed, as appropriate. Metrolinx will coordinate compensation with public agencies through the implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects. This Protocol is currently under development, and compensation will vary depending on where vegetation is located (municipal land, private property, conservation authority lands, or federal lands).

Wellhead Protection Areas (WHPA-D): Mitigation will be implemented as follows:

- Prior to Mulock GO Station construction a Hazardous Materials and Fuel Handling Plan will be developed to confirm that fuels and other hazardous materials are handled and stored in a safe manner during the construction process. The plan will take into consideration the proximity to WHPA locations and associated Vulnerable Areas.

Construction – All GO Stations

Significant Natural Areas, Wildlife Habitat and Species at Risk: Where SAR habitat was identified and if it is identified within the GO Station study areas during additional (future) field investigations, mitigation measures for these areas will be implemented as follows:

- A Soil Management Plan (SMP) will be prepared by a Qualified Professional as defined in O. Reg. 153/04 for managing soil materials on-site (includes excavation, location of stockpiles, reuse, and off-site disposal);
    - The SMP will include a strategy to prevent Bank Swallow nesting in stockpiled or exposed soils.
- An ESC Plan and Dewatering Plan will be developed prior to construction and will conform to industry BMPs and recognized standard specifications. The ESC Plan shall also take into account the GGHACA ESC Guidelines for Urban Construction (2006) for the Spadina-Front, Bloor-Lansdowne and Kirby GO Stations and the Technical Guidelines for Stormwater Management Submissions (LSRCA, 2016) for the Mulock and Innisfil GO Stations. The ESC Plan will outline a process of resolving issues of extended encroachment, including clean-up, maintenance of ESC measures, and consideration of alternative ESC measures;
- All work zones will be clearly marked on detailed design drawings and the ESC Plan to indicate that no work will occur outside the work zone;
- Erosion and Sediment Control (ESC) measures will be implemented prior to Project construction and maintained during the construction phase in accordance with the ESC Plan;
- If the ESC measures or dewatering measures are not functioning properly, no further work in the affected areas will occur until the problem is addressed;

- All disturbed areas within the construction site will be stabilized and re-vegetated as soon as conditions allow;
- Erosion and Sediment Control (ESC) measures will be left in place until all areas within the construction site have been stabilized and will then be removed;
- Changes to site water balance and specifically base water balance of natural features represent a risk to the ecological health and function of the natural features present. To mitigate the increase in runoff from the impervious areas and the potential impact to natural features, the Stormwater Management Plan will be designed to meet water balance targets, and provide the framework for safe conveyance of storm runoff from the site;
- Dust from the work areas will be controlled through suppressants (i.e., water);
- To the extent possible construction equipment and methods will be designed to avoid levels of noise, vibration and lighting that could represent a significant affect to sensitive flora and fauna;
- Wet weather restrictions shall be applied during site preparation and excavation;
- A Construction Emergency Response and Communications Plan will be developed prior to construction and followed throughout the construction phase (includes spill response and contingency plans);
- A Hazardous Materials and Fuel Handling Plan will be developed prior to Project construction, to confirm that fuels and other hazardous materials are handled and stored in a safe manner during the construction process. Hazardous material and fuel storage, refueling and maintenance of construction equipment will occur within designated areas only; and
- A Spill Prevention and Contingency Plan will be developed and will be in place prior to construction of the Project. Personnel will be trained in how to apply the plans and the plans will be reviewed on a regular basis to strengthen their effectiveness and facilitate continuous improvement. Spills or depositions into natural features will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the Contingency Plan. A hydrocarbon spill response kit will be on-site at all times during the work. Spills will be reported to the Ontario Spills Action Centre at 1-800-268-6060.

All requirements under the *Invasive Species Act*, 2015, will be met, including the following mitigation measures:

- All disturbed areas within the construction site will be re-vegetated as soon as conditions allow;
- A SMP will be prepared by a Qualified Professional as defined in O. Reg. 153/04 for managing soil materials on-site (includes excavation, location of stockpiles, reuse, and off-site disposal);

- In accordance with the SMP, topsoil will be stockpiled separately from other soil materials and used for the restoration to facilitate natural regeneration of native species through the preservation of the existing seed bank;
- Where re-vegetation is required, a native seed mix, which does not contain invasive species, will be used;
- Ash trees, leaves, logs, or wood chips will not be removed out of the Regulated Area, as identified on the CFIA website (CFIA, 2014). This is necessary to prevent the spread of the EAB to un-infested areas in Ontario. The Contractor must dispose of all wood at a Registered Waste Facility; and
- If extensive invasion of non-native species is identified as a result of the Project, contingency measures may include an applicable herbicide application. A herbicide application plan will be developed as required.

All requirements under the *Ontario Water Resources Act* (OWRA), R.S.O. 1990, c. O.40 with respect to water taking, management and discharge will be met, including the following mitigation measures and best practices:

- Approval of water takings in accordance with the MOECC Permit to Take Water (PTTW) process or within the Environmental Activity and Sector Registry (EASR) framework;
- Any discharge from dewatering will be discharged to a municipal sewer in accordance with the applicable By-law;
- In the event of sediment discharge, all operations will stop immediately until the problem can be resolved; and
- If significant changes in water levels/seepage areas are noted, operations will cease until water levels recover.

Significant Valleylands – Mulock GO Station: Mitigation will be implemented as follows:

- Geotechnical studies will be completed prior to construction to identify any design and mitigation requirements in, and around, Valleylands;
- Detailed design plans will be submitted to the LSRCA, as applicable, for voluntary review in order to confirm that all work is in compliance with O. Reg. 179/06; and
- Wet weather restrictions will be applied during site preparation and excavation. Work will be avoided in Valleylands during periods of excessive precipitation and/or excessive snow melt.

Fish Habitat – Mulock and Kirby GO Stations: Mitigation will be implemented as follows:

- An Aquatic Habitat Assessment Report will be prepared prior to construction to identify specific effects and mitigation measures associated with detailed culvert and bridge design plans;
- All in-water work will be conducted in accordance with the timing windows to be determined in the Aquatic Habitat Assessment Report;

- The footprint of disturbed areas will be minimized to the extent possible. Vegetated buffers will be left in place adjacent to watercourses/waterbodies to the maximum extent possible;
- Wet weather restrictions will be applied during site preparation and excavation. Work will be avoided near watercourses during periods of excessive precipitation and/or excessive snow melt;
- All culverts, bridges and in-water structures will be designed to meet appropriate storm design requirements in order to avoid hydrologic affects; and
- All requirements under the *Fisheries Act*, 1985 will be met including any Self-Assessments or permitting.

Geohazard Assessment – Mulock GO Station

- A Geohazard Assessment Report will be completed prior to detailed design of the Mulock GO Station to assess the erosion hazard and risk to river channel and bank stability potentially resulting from the development of the Mulock GO Station. The Geohazard Assessment Report will inform the infrastructure and bank treatments required to manage these hazards.

Operations and Maintenance – All GO Stations

Significant Natural Areas, Wildlife Habitat and Species at Risk: Where SAR were identified and if SAR habitat is identified within the GO Station study areas during future field investigations, mitigation measures for these areas will be implemented as follows:

- Any major maintenance work that would result in the replacement or upgrade of major infrastructure components requiring earth-moving work will be conducted in accordance with the applicable mitigation measures listed under the construction phase;
- Any required permitting or authorizations will be obtained, as required;
- Any herbicide applications to clear vegetation within the GO Stations lands will be applied in accordance with industry BMPs and regulations. If herbicides are applied, only staff certified in their application will undertake the work. Herbicides will not be applied on windy days when there is greater potential for drift to adjacent natural areas;
- Any tree clearing or limb trimming will be limited to meet necessary safety clearances;
- Trees will be trimmed by a Qualified Professional to limit tree damage;
- An Emergency Response and Communications Plan will be developed and followed throughout the operations and maintenance phase (includes spill response and contingency plans);
- Metrolinx will develop spill prevention and contingency plans for the GO Stations. Personnel will be trained in how to apply the plans and the plans will be reviewed on a regular basis to strengthen their effectiveness and facilitate continuous improvement;
- Hazardous material and fuel storage, refueling and maintenance of equipment will occur within designated areas only; and

- Spills or depositions into natural features/areas will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. A hydrocarbon spill response kit will be on-site at all times during the work. Spills will be reported to the Ontario Spills Action Centre at 1-800-268-6060.

Amphibian and Reptiles – Kirby GO Station:

- Mitigation measures outlined in Best Management Practices for Mitigating the Effects of Roads on Amphibian and Reptile Species at Risk in Ontario (MNRF, 2016), will be applied as required (i.e., tunnels) to minimize effect of amphibian and reptile road crossings.

Wellhead Protection Areas (WHPA-Q): Mitigation will be implemented as follows:

- Kirby GO Station - Recharge within the study area will be maintained to the extent possible. The TRCA will be consulted regarding any potential requirements for recharge management related to parking lots and buildings that will be constructed as part of the Kirby GO Station. The MOECC will also be consulted regarding demand (i.e. water taking) requirements specific to source protection in the Source Protection Plans; and
- Mulock GO Station - Recharge within the study area will be maintained to the extent possible. The LSRCA will be consulted regarding any potential requirements for recharge management related to parking lots and buildings that will be constructed as part of the Mulock GO Station. The MOECC will also be consulted regarding demand (i.e. water taking) requirements specific to source protection in the Source Protection Plans.

4.3.1.3 Monitoring Activities

Pre-Construction/Land Clearing – All GO Stations

Significant Natural Areas: To monitor impact to significant natural areas and to natural features and areas during pre-construction land-clearing the following monitoring will be applied:

- A qualified Environmental Inspector[18] will conduct regular monitoring, to be defined prior to pre-construction land clearing, to confirm that all activities are conducted in accordance with mitigation plans and all work is conducted from within the specified work zones;
- The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects; and
- An Environmental Inspector will inspect and confirm ESC measures are functioning properly and are properly maintained throughout the construction phase and that all work is conducted from within the specified work zones.

[18] *A "qualified" Environmental Inspector includes professional biologists, ecologists or technicians who understand environmental policies and regulations and how they apply to the specific conditions on a site, including ESC measures and Mitigation and Monitoring Plans. These professionals also have the ability to address any issues on-site (including repair) without causing any additional adverse effects to the natural heritage features and functions.*

Wildlife Habitat:

- A qualified Environmental Inspector will conduct regular monitoring, to be defined prior to pre-construction land clearing, to confirm that all activities are conducted in accordance with mitigation plans and all work is conducted from within the specified work zones; and
- The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.

Species at Risk: Monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA.

Nests of Migratory Birds: An Environmental Inspector will conduct regular monitoring, to be defined prior to pre-construction land clearing, to confirm that activities do not encroach into nesting areas or disturb active nesting sites.

Construction – All GO Stations

Significant Natural Areas, Wildlife Habitat and Species at Risk: The following monitoring activities will be applied:

- A qualified Environmental Inspector is required throughout the construction period to ensure that protection measures are implemented, maintained and enforced;
- An Environmental Inspector will conduct regular inspections, to be defined prior to Project construction, to confirm ESC measures are functioning properly and are properly maintained throughout the construction phase;
- An Environmental Inspector will conduct regular monitoring, to be defined prior to Project construction, to confirm that all activities are conducted in accordance with mitigation plans and all work is conducted from within the specified work zone;
- Workers will report any instances of spills to their supervisors;
- Areas of re-vegetation will require watering and will be monitored by an Environmental Inspector for at least two years to confirm at least an 80 percent survival rate and confirm that non-native and invasive species are not becoming pervasive as a result of the Project, unless otherwise specified within the Vegetation Compensation Protocol for Metrolinx RER Projects;
- An Environmental Inspector will be on-site during any dewatering within 120 metres of natural features. The Environmental Inspector will confirm that the filter bag is working appropriately and that no sediment is entering significant natural features;
- An Environmental Inspector will conduct regular inspections of dust emissions, to be defined prior to Project construction, to confirm dust control watering frequency and rates are adequate; and
- An Environmental Inspector will conduct regular inspections of noise, vibration, and lighting levels to be defined prior to Project construction, to confirm levels are adequate and represent an insignificant risk to sensitive flora and fauna.

Significant Valleylands – Mulock GO Station: An Environmental Inspector will conduct regular inspections, to be defined prior to Project construction, to confirm that all work is conducted in accordance with plans and any recommendations provided through the conservation authority voluntary review.

Barn Swallow Nests: An Environmental Inspector will conduct regular inspections, to be defined prior to Project construction, to confirm that all work is conducted in accordance with the ESA, 2007, and any associated permits/approvals.

Fish Habitat – Mulock and Kirby GO Stations: An Environmental Inspector will conduct regular inspections, to be defined prior to Project construction, to confirm that all work is conducted in accordance with the *Fisheries Act* and any associated permits/approvals.

Wellhead Protection Areas (WHPA-D) – Mulock GO Station: An Environmental Inspector will conduct regular inspections, to be defined prior to Mulock GO Station construction, to confirm that hazardous material transport and refueling is conducted outside of WHPAs and in accordance with the Hazardous Materials and Fuel Handling Plan.

Operations and Maintenance – All GO Stations

Significant Natural Areas, Wildlife Habitats and Species at Risk: The following monitoring activities will be applied:

- Monitoring will be undertaken subject to the scale of the maintenance work. Monitoring similar to that required during construction may be required for large-scale maintenance and replacement work;
- Contractors, GO Station staff and maintenance contractors are responsible for monitoring the effects of trimming and herbicide application. Any significant concerns will be reported to superiors for timely resolution; and
- GO Station staff and maintenance contractors are responsible for reporting spills and other issues and ensuring their timely resolution.

Amphibian and Reptiles – Kirby GO Station:

- An Environmental Inspector will inspect and confirm the Amphibian and Reptile crossing measures are functioning properly. GO Station staff and maintenance contractors are responsible for ensuring the crossings are properly maintained throughout the operation phase.

Wellhead Protection Areas (WHPA-Q):

- Kirby GO Station - Recharge with the study area will be monitored regularly to ensure compliance with the TRCA recharge management policies and the demand requirements of the Approved Source Water Protection Plan for the CTC Source Water Protection Area; and
- Mulock GO Station - Wellhead Protection Areas (WHPA-Q): Recharge with the study area will be monitored regularly to ensure compliance with the LSRCA recharge management

policies and the demand requirements of the Source Protection Plan for the Lakes Simcoe and Couchiching/Black River Source Protection Area.

4.3.2 Trees

4.3.2.1 Potential Effects

Construction – All GO Stations

Recommendations based on woody vegetation effects are divided into four categories:

- Preserved: this applies to vegetation that will not be affected by the Project, once mitigation measures have been applied;
- Removal: this applies to vegetation that is deemed to be within the construction envelope (i.e., GO Station footprints) and would not be able to withstand construction-related activities or changes to grading. This designation may also be applied to trees and shrubs that are dead, in poor condition, or trees that could pose future safety concerns;
- Transplant: this applies to woody vegetation that is deemed to be within the construction envelope (i.e., GO Station footprint), in good condition, and typically less than ten cm DBH and of a single stem. It should be noted that transplanting of trees is dependent on available space; and
- Potential for injury: woody vegetation identified with the potential for injury are those where the minimum TPZ encroaches into the proposed construction envelope (i.e., GO Station footprint).

Tree and shrub removal is required to accommodate the GO Stations. Land clearing, grading and construction will result in the removal of both trees and shrubs (i.e., woody vegetation) within the GO Station footprints. Specific impacts to woody vegetation as a result of the GO Stations will be better known once the design is refined. At this time, direct impacts have been assumed based on the GO Station footprints. Trees on lands immediately adjacent to the construction limits may be impacted due to their root zones overlapping with proposed construction (i.e., grading). Clearing of trees and shrubs also has the potential to disturb or destroy nests of migratory birds which are protected under the MBCA.

Table 4-5 details the quantity of tree and shrub (i.e., woody vegetation) removals, based on the results of the TIPs. Additional trees will be documented in Arborist Reports once PTE requests have been obtained during the appropriate field season and detailed design has progressed, required as part of the future works commitment. The Spadina-Front GO Station does not require an Arborist Report as 4T had the required access to lands for the TIP. For further details relating to species type, size and conditions please refer to the TIPs in Appendix C of Volume 2 through Volume 6 of this EPR Addendum.

Table 4-5: Tree Removal Chart Summary

Tree Category	Potential Removals				
	Spadina-Front	Bloor-Lansdowne	Kirby	Mulock	Innisfil
Total	498	South study area: 2,692 North study area: 841	316	146	832

Tree injury occurs when either tree protection hoarding cannot be placed at the minimum required distance from the trunk due to constraints or conflicts, or where the minimum TPZ overlaps with the construction limits. Further assessments for tree and shrub injury, as a result of construction, will be carried out once PTE requests have been obtained. Information on tree and shrub injury as a result of construction are provided in the TIPs in Appendix C of Volume 2 through Volume 6 of this EPR Addendum.

Trees and shrubs located outside GO Station footprints but within the six metre and 12 metre buffer and have been identified for preservation (i.e., retention). Information on trees and shrubs identified for preservation are provided in TIPs in Appendix C of Volume 2 through Volume 6 of this EPR Addendum.

Operations and Maintenance – All GO Stations

Deterioration of tree vitality over time for trees and/or shrubs that are adjacent to the GO Stations is currently the only identified effect due to the Project during the operations/maintenance phase. It is noted that new growing conditions (i.e., new exposure to wind, sunscald, and root damage) may result in failure of trees or their branches.

4.3.2.2 Mitigation Measures

Construction – All GO Stations

As the Project design progresses, an Arborist Report will be completed for all trees and shrubs (i.e., woody vegetation) that may be impacted by the GO Stations, including trees/shrubs to be preserved, removed or injured. The Arborist Report will provide further details regarding construction disturbances and staging area impacts on trees/shrubs, identify suitable restoration/compensation measures to accommodate site-specific impacts, mitigation and replacement measures to offset vegetation loss and provide the appraisal values of trees and shrubs to be removed. The Arborist Report will refine and build upon the TIPs in Appendix C of Volume 2 through Volume 6 of this EPR Addendum.

Further consultation with potentially impacted property owners will be undertaken when the detailed tree and shrub impacts are known. Where tree permits are required on municipal land or private property adjacent to the GO Station footprints, Metrolinx will work with appropriate authorities as necessary to obtain all applicable permits and approvals. In order to mitigate against canopy loss, and vegetative cover, and as part of an ongoing commitment, Metrolinx is currently finalizing the Vegetation Compensation Protocol for Metrolinx RER Projects. Once

the Protocol has been finalized, consultation with key stakeholders including municipalities and Conservation Authorities will be undertaken, to discuss how the Protocol will apply to this Project. Vegetation that is removed will be compensated for in accordance with the provisions of this Protocol, as follows:

- **For Municipal/Private Trees:** Metrolinx will work with each municipality to develop a municipality-wide streamlined tree permitting/compensation approach for municipal and private trees that will be affected by Project development;
- **For Trees within Metrolinx Property:** Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property (includes trees within GO Station property and within the Barrie rail corridor). This will involve categorizing trees by community types/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with conservation authorities and municipalities to develop the final Vegetation Compensation Protocol;
- **Conservation Authorities:** For vegetation removals within conservation authority lands where required, applicable removal and restoration requirements will be followed (not applicable to the Spadina-Front, Bloor-Lansdowne and Innisfil GO Stations; however if it is determined that the GO Station works will require work within the TRCA or/or LSRCA regulated area, Metrolinx will engage with the TRCA and/or LSRCA and will adhere to TRCA and/or LSRCA's requirements for regulated areas to the greatest extent possible);
- **Federal lands:** For vegetation removals within federally-owned lands where required, applicable removal and restoration requirements will be followed (not applicable to any of the GO Stations); and
- **Tree End Use:** Metrolinx will develop options for the end use of trees removed from Metrolinx property (i.e., reuse/recycling options).

Any damaged trees will be pruned or removed through the implementation of proper arboricultural techniques, under supervision of an International Society of Arboriculture (ISA) Certified Arborist. As these are general mitigation and compensation measures based on land-ownership, only those that apply to the individual GO Stations will be followed when identifying future compensation requirements.

Timing windows for trees and shrubs that have been identified as part of the habitat of a SAR will be confirmed by the MNRF. To reduce the possibility of contravention of the MBCA, vegetation removal shall be scheduled to occur outside of the overall bird nesting season of April 1 to August 31 in any given year. Some birds may nest before and/or after this peak bird nesting season due to annual seasonal fluctuations. Therefore, if a nest of a migratory bird is found within the construction area outside of this nesting period it shall receive protection. If vegetation must be removed during the overall bird nesting season, nest and nesting activity searches will be conducted in areas defined as simple habitat[19]by a qualified Ecologist/Avian

[19] *Simple habitat refers to habitat that contain few nesting spots or few species of migratory birds, where identification of active nests or confirmed nesting activity can be completed with confidence. According to ECCC (2014), examples of simple habitat include the following:*

Biologist no more than 24 hours prior to vegetation removal. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (Cadman *et al.*, 2007). If vegetation removal must occur in complex habitats within the above-listed timing windows and absolutely cannot be avoided, the same BMPs such as nest and nesting activity searches described above will be undertaken. If a nesting migratory bird (or SAR protected under the ESA) is identified within or adjacent to the construction site, regardless of the timing window recommended, all activities will stop and the Contractor (with assistance from a qualified Ecologist/Avian Biologist) will discuss mitigation measures with the Environmental Inspector.

Prior to the commencement of construction, tree protection barriers will be installed in accordance with municipal by-laws, in accordance with the approved tree protection plans and Arborist Reports.

Measures beyond the standard tree protection hoarding may be required to protect trees where there is potential for "tree injury" (i.e., a reduction in the minimum tree protection distance or work that may be required within a TPZ). These measures cannot be determined at this stage as detailed design drawings showing the limits of work (i.e., clearing, grading, etc.), are required to accurately determine the TPZ, identify which trees will be subject to potential injury, and which remedial measure would be most applicable.

If it is determined that trees require pruning, trees shall be pruned in a manner that minimizes physical damage and promotes quick wound closure and regeneration. If earthworks are required immediately adjacent to a TPZ, and there is a potential to encounter roots, it is recommended that an exploratory exercise with an air spade be conducted.

There are several common impacts to trees that can occur during construction. A list of typical general notes, as well as protection details are provided in the TIPs in Appendix C of Volume 2 through Volume 6 of this EPR Addendum. The following are standard BMPs to implement prior to and during construction activities:

- Prior to construction, a site meeting shall be held with the Contractor(s) and Contract Administrator to review the clearing limits and confirm the installation location for the tree protection barrier;
- Tree protection barriers shall be installed as per the construction specifications and applicable municipal details as per the TIPs in Appendix C of Volume 2 through Volume 6 of this EPR Addendum. All supports and bracing to safely secure the barrier will be placed outside the TPZ;

- *Urban parks consisting mostly of lawn with a few isolated trees;*
- *Vacant lot with few possible nest sites;*
- *Previously cleared area where there is a lag between clearing and construction activities (and where ground nesters may have been attracted to nest in cleared areas or in stockpiles of soil); or*
- *Structure such as a bridge, beacon, tower or building (often chosen as a nesting spot by robins, swallows, phoebes, nighthawks, gulls and others).*

- The TPZ is considered a “no touch zone” where by there will be: no construction; no altering of grade by adding fill; no excavating, trenching, scraping, dumping or disturbance of any kind; no storage of construction materials, equipment, soil, construction waste or debris; no disposal of any liquids (i.e., concrete, gas, oil, paint); no movement of vehicles, equipment or pedestrians; and no parking of vehicles or machinery;
- Inspection of the tree protection barrier, including photographic records and deficiency notes, shall be undertaken by the site supervisor and submitted to the Contract Administrator prior to the commencement of construction, during construction and after construction is completed; and
- All removals should be felled into the work area to ensure that damage does not occur to the trees within the TPZ. Upon completion of the tree removals, all felled trees are to be removed from the site, and all brush chipped. All brush, roots and wood debris should be shredded into pieces that are smaller than 25 mm in size to ensure that any insect pests that could be present within the wood are destroyed.

Operations and Maintenance – All GO Stations

Maintenance, seasonal pruning or removal may be required to prevent woody material falling onto the Barrie rail corridor, parking areas, or GO Station property. Pruning and felling will be carried out by or under the direction of an ISA Certified Arborist. Tree and shrub replacement may be required to compensate adjacent landowners if the condition of off-site trees and shrubs deteriorates as a result of Project implementation, and compensation will be determined in accordance with the Vegetation Compensation Protocol.

4.3.2.3 Monitoring Activities

Construction – All GO Stations

Environmental Inspectors will be on-site during key construction activities (i.e., vegetation removal), as required, to ensure compliance with environmental requirements. The Environmental Monitors will be responsible for:

- On-site inspection as required during construction to ensure that only specified trees/shrubs are removed, fencing is intact and there is no damage caused to the remaining trees/shrubs and adjacent vegetation communities. Construction and/or silt fencing will be repaired if it is damaged. Any damaged/injured trees/shrubs will be pruned through the implementation of proper arboricultural techniques, under supervision of an ISA Certified Arborist or Forester; and
- Regular monitoring, to be defined prior to pre-construction land clearing, to confirm that activities do not encroach into nesting areas or disturb active nesting sites.

Restoration/compensation and/or post-construction monitoring may be required to ensure continued ecological function of natural features within or in the immediate vicinity of the GO Station footprints (includes the GO Stations, plus the Barrie rail corridor) as identified through the Vegetation Compensation Protocol for Metrolinx RER Projects. These activities include:

- Post-planting monitoring of restoration areas for one year after installation. One site visit will be conducted during the subsequent growing season to confirm survival of plantings and/or seed mix. Should the plantings and/or seed mix not survive, additional seeding and/or plantings will be undertaken one year thereafter with one additional monitoring visit in the following growing season;
- Additional restoration/compensation measures and/or monitoring may be required based on the results of additional surveys and consultations with regulatory agencies; and
- Restoration/compensation and/or monitoring will be confirmed through regulatory agency consultation during detailed design.

Operations and Maintenance – All GO Stations

Routine inspections will identify dead trees or limbs adjacent to the GO Station properties (including the segment along the Barrie rail corridor) that require maintenance for reduction of safety risks. An ISA Certified Arborist will inspect and assess trees on-site as well as on lands immediately adjacent annually (at a minimum) from the property.

4.3.3 Archaeological Resources

4.3.3.1 Potential Effects

Construction – All GO Stations

Land-disturbing activities have the potential to impact known and/or potential archaeological resources. The lands in the Spadina-Front, Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations study areas hold the potential for the recovery of both pre-contact and contact period archaeological resources.

Operations and Maintenance – All GO Stations

During operations and maintenance, no potential effects related to archaeological resources are anticipated.

4.3.3.2 Mitigation Measures

Construction – All GO Stations

With regard to the various zones of archaeological potential identified in the AAs provided in Appendix D of Volume 2 through Volume 6 of this EPR Addendum, additional AA studies will be completed in order to confirm mitigation requirements. Overall, the following mitigation measures apply:

- Areas determined to be disturbed do not require further assessment;
- If the final limits of the GO Stations are altered and fall outside the GO Station study area on which the Stage 1 AA is based, an additional Stage 1 AA is required to assess the new footprint;
- Lands that have undergone previous assessment and have been cleared of concern do not require further assessment; and

- No construction activities shall take place within the GO Station study areas prior to the MTCS confirming in writing that all archaeological requirements have been met. In the event that archaeological remains are discovered during construction activities, the consultant archaeologists, approval authority and the MTCS should be notified immediately.

GO Station-specific mitigation measures are:

- Spadina-Front GO Station:
  - Areas determined to be undisturbed will be subjected to a Stage 2 Archaeological Assessment (Stage 2 AA) in accordance with Section 2.1.2 of the 2011 S&G prior to construction activities to ensure no cultural heritage resources will be impacted;
  - Areas determined to be disturbed do not require further assessment;
  - Should deeply buried archaeological materials be encountered during construction, all work will cease and a professionally licenced archaeologist will be consulted to assess the cultural heritage value and significance of the archaeological deposits;
  - Areas identified to contain deeply buried archaeological potential must be subjected to a Stage 2 AA in accordance with Section 2.1.7, Standard 3 or 4 and Guideline 2 of the 2011 S&G, prior to construction activities; and
  - If the final limits of the Spadina-Front GO Station are altered and fall outside the current study area, an additional Stage 1 AA is required to assess the new footprint.
- Bloor-Lansdowne GO Station:
  - Areas determined to be undisturbed will be subjected to a Stage 2 Test pit survey in accordance with Section 2.1.2 of the 2011 S&G prior to construction activities to ensure no cultural heritage resources will be impacted;
  - Areas determined to be disturbed and previously assessed lands that were deemed clear from further assessment do not require further archaeological assessment;
  - Should deeply buried archaeological materials be encountered during construction, all work will cease and a professionally licenced archaeologist will be consulted to assess the cultural heritage value and significance of the archaeological deposits;
  - Areas identified to contain deeply buried archaeological potential must be subjected to a Stage 2 AA in accordance with Section 2.1.7, Standard 3 or 4 and Guideline 2 of the 2011 S&G, prior to construction activities; and
  - As identified by P057-0837-2016, the study area includes lands that may contain remnants of a historic cemetery related to the St Helens Roman Catholic Church (Figure A-18). As such, lands within 10 metres of known cemeteries require completion of a Cemetery Investigation prior to any proposed ground disturbance. A Stage 2 AA of these lands is required with additional archival research; and

- If the final limits of the Bloor-Lansdowne GO Station are altered and fall outside the current study area, an additional Stage 1 AA is required to assess the new footprint.

- Kirby GO Station:
  - Areas determined to be undisturbed will be subjected to a Stage 2 AA in accordance with Section 2.1.2 of the 2011 S&G prior to construction activities to ensure no cultural heritage resources will be impacted;
  - As identified by This Land Archaeology Inc. (TLA) in their assessment, a Stage 2 test pit survey at 5 meter intervals, in accordance with Section 2.1.2 of the 2011 S&G prior to construction activities to ensure no cultural heritage resources will be impacted, is required of the woodland area within the study area as no previous assessment was conducted within the property;
  - Areas determined to be disturbed do not require further assessment;
  - Areas previously assessed by TLA do not require further Stage 2 or 3 archaeological assessment, however they do fall subject to predevelopment topsoil removal, see next bullet;
  - As per the York Region Archaeological Management Plan (York Region, 2014), the predevelopment topsoil removal (stripping) within the study area is required of lands that are located within 1,000 metres of documented village sites and 300 metres of any current or former water source (see Figure A-11 in Volume 4 - Appendix D of this EPR Addendum). This stripping shall occur after Stage 2 AA and potential subsequent assessments have been conducted; and
  - If the final limits of the Kirby GO Station are altered and fall outside the current study area, an additional Stage 1 AA is required to assess the new footprint.

- Mulock GO Station:
  - Areas determined to be undisturbed will be subjected to a Stage 2 AA in accordance with Sections 2.1.2 of the 2011 S&G prior to construction activities to ensure no cultural heritage resources will be impacted;
  - Areas determined to be disturbed do not require further assessment;
  - Areas that were previously assessed and determined to hold low potential do not require further archaeological assessment; and
  - If the final limits of the Mulock GO Station are altered and fall outside the current study area, an additional Stage 1 AA is required to assess the new footprint.

- Innisfil GO Station:
  - Areas determined to be undisturbed, as well as identified by P316-083-2010, will be subjected to a Stage 2 AA in accordance with Sections 2.1.1 and 2.1.2 of the 2011 S&G prior to construction activities, to ensure that no cultural heritage resources will be impacted;

- Areas previously assessed by P057-0803-2015 do not require further archaeological assessment, as they have been subjected to subsequent Stage 3 and 4 AA;
- Areas determined to be disturbed do not require further assessment; and
- If the final limits of the Innisfil GO Station are altered and fall outside the current study area, an additional Stage 1 AA is required to assess the new footprint

4.3.3.3 Monitoring Activities

Construction – All GO Stations

The Environmental Inspector shall monitor land-disturbing activities to confirm they remain within the GO Station study areas subject to the AA(s). Any site personnel responsible for carrying out or overseeing land-disturbing activities shall be informed of their responsibilities in the event that an archaeological resource is encountered.

Operations and Maintenance – All GO Stations

No monitoring activities are required.

4.3.4 Cultural Heritage Resources

4.3.4.1 Potential Effects

Construction – All GO Stations

Construction activities associated with the GO Stations could potentially directly or indirectly impact the heritage attributes of the screened CHRs noted within Table 3-5. Impacts to properties are defined as:

- Direct: A direct impact would have a permanent effect on the CHVI of a property or result in the loss of a heritage attribute on all or part of the PHP. For example: removal or demolition of a building or structure in all or part of the structure, including individual heritage attributes; and
- Indirect: An indirect impact would be the result of an activity on or near the property that may affect its CHVI and/or heritage attributes, but it does not affect the use of the building or physically alter any heritage attribute. For example: isolation of a PHP from its surrounding environment, context or a significant relationship, vibration damage to a structure due to construction.

An assessment of potential effects on these properties as a result of the implementation of the GO Stations is provided in Table 4-6.

The following CHRs may be directly affected by the new GO Stations:

- Innisfil GO Station:
  - 1350 6th Line – the Innisfil GO Station will be constructed on a portion of the property east of the farmhouse.

The following properties of known or potential CHVI may be indirectly affected by the new GO Stations:

- Spadina-Front GO Station:
  - Bathurst Street Bridge;
  - Draper Street, Heritage Conservation District;
  - 517 Wellington Street West/31 Portland Street;
  - Fort York National Historic Site of Canada; and
  - 532/530 Front Street West.
- Bloor-Lansdowne GO Station:
  - 158 Sterling Road (Northern Aluminum Company Building);
  - 222 Lansdowne Avenue (National Cash Register Company);
  - 87 Wade Avenue;
  - 213 Sterling Road; and
  - 163 Sterling Road.
- Kirby GO Station:
  - 2480 Kirby Road; and
  - 11320 Keele Street.

Operations and Maintenance – All GO Stations

No potential effects to CHRs are anticipated during the operations and maintenance phase of the Project.

4.3.4.2 Mitigation Measures

Construction – All GO Stations

A HIA will be completed for the properties which are directly affected:

- Innisfil GO Station:
  - 1350 6th Line.

The HIA will be completed prior to GO Station construction (i.e., during detailed design) based on GO Station timelines and property access constraints. The HIA will be completed in accordance with the MTCS S&G and will be developed in consultation with, and submitted for review to, the MTCS and other heritage stakeholders (municipal planners and/or municipal heritage committees). The HIA will: identify and assess potential project-related impacts on the CHVI and heritage attributes of the heritage properties; discuss alternatives considered and recommend the best alternative; and, provide mitigation measures to avoid or reduce impacts on the CHVI and heritage attributes.

Although the property at 1350 6th Line has a Statement of Cultural Heritage Value or Interest, including a list of heritage attributes, the property has not been evaluated against O. Reg.10/06

criteria. A scoped CHER to evaluate the property against O. Reg.10/06 criteria must preceed the HIA.

In July 2018 Cultural Heritage Assessment Reports (CHARs) were prepared for Spadina-Front GO Station, Bloor-Lansdowne GO Station and Kirby GO Station to build on the findings of the CHSR and to identify potential adverse impacts to identified cultural heritage resources and to recommend mitigation measures to lessen or avoid any identified impacts. The results of the CHARs are included in this EPR Addendum.

The mitigation listed in Table 4-6 will be implemented for indirectly affected properties.

Table 4-6: Summary of Potential Cultural Heritage Impacts and Mitigation Measures for Properties Associated with GO Stations

CHR #	Name/Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Impact	Mitigation
Spadina-Front GO Station					
SP-1	Bathurst Street Bridge	Listed Metrolinx Conditional Provincial Heritage Property of Provincial Significance	The Statement of Cultural Heritage Value (SCHV) for the structure describes it as follows: "The Bathurst Street Bridge is a 10-panel. Warren riveted steel truss bridge spanning approximately 60 metres (200 feet) across the Union Station Railway Corridor (USRC) in downtown Toronto. As originally constructed in 1903 for the Grand Trunk Railway (GTR) where its line crossed the Humber River, the bridge is attributed to the Canadian Bridge Company. The bridge was made redundant in 1911 when the GTR was required to construct a girder bridge as part of the Toronto Grade Separation project. The 1903 bridge was disassembled and stored until 1916 when it was rebuilt over the railway tracks at Bathurst Street in a joint effort by the GTR and the City of Toronto. In 1931, the bridge was realigned after the City of Toronto straightened Bathurst Street. The Bathurst Street Bridge is one of the oldest remaining bridges in the City of Toronto."	Not within Vibration ZOI (property is >200m from Project footprint). No indirect adverse impacts identified.	No indirect adverse impacts identified. No mitigation measures are required.
SP-2	Draper Street, Heritage Conservation District	Part V Designation, OHA (By-Law 026-99)	The streetscape is generally characterized by the cohesive scale and design of the c.1881-1889 dichromatic brick duplex houses with mansard rooves, projecting bays, and party walls.	Indirect effect. Property is adjacent to the Spadina-Front GO Station and may experience indirect effects as a result of construction vibrations.	In order to mitigate potential indirect impacts from construction vibrations, the following mitigation measures will be undertaken: • Pre-construction consultations between the applicant and owners/occupants; • Pre-construction measurements of background vibration levels; • Pre-condition survey by means of a photographic record of potentially affected structure façades and all surfaces, including visible sections of building foundations, building cladding, doors, windows, interior wall finishes, surface pavement, sidewalks, signs and trees. Each of the elements should be rated on their general condition (new, good, fair, poor, severe), and visible defects will be photographed; and • Work that may exceed the vibration limits outlined in the City of Toronto By-law No. 514-2008 or that may cause structural damage should be monitored. These recommendations are consistent with the mitigation measures outlined in the Noise and Vibration Impact Assessment which forms part of the EPR Addendum for this Project. A Noise and Vibration

CHR #	Name/Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Impact	Mitigation
					Control Plan will be developed for the Project prior to construction. All measures outlined in the Noise and Vibration Control Plan will be implemented for the properties of known and potential CHVI that fall within the ZOI.
SP-4	517 Wellington Street West/31 Portland Street.	Part IV Designated (By-Law 758-79) Part V Designation (King-Spadina HCD, By-law 1111-2017)	The CHVI and attributes of the property are described in the by-law as follows: “This building is designated on architectural grounds. In 1909 the Copp Clark Publishing Company occupied one of the first industrial buildings on Wellington Street West. The architects, Wickson &. Gregg, were also responsible for the impressive four-storey warehouse and office building at the comer of Portland Street in 1912 when the Company completed its move from downtown Front Street These buildings are good example of functional design for industrial use with plain decorative brickwork and cast stone features at the entrances and in the parapet facades.”	Not within Vibration ZOI (structure is >50m from Project footprint). No indirect adverse impacts identified.	No indirect adverse impacts identified. No mitigation measures are required.
SP-5	532/530 Front Street West	None	This property has no previous heritage recognition. The potential CHVI and heritage attributes of the property are limited to the neo-Classical red brick former residential structure and its physical attributes.	Indirect effect. Property is adjacent to the Spadina-Front GO Station and may experience indirect effects as a result of construction vibrations.	In order to mitigate potential indirect impacts from construction vibrations, the following mitigation measures are recommended: • Pre-construction consultations between the applicant and owners/occupants; • Pre-construction measurements of background vibration levels; • Pre-condition survey by means of a photographic record of potentially affected structure façades and all surfaces, including visible sections of building foundations, building cladding, doors, windows, interior wall finishes, surface pavement, sidewalks, signs and trees. Each of the elements should be rated on their general condition (new, good, fair, poor, severe), and visible defects will be photographed; and • Work that may exceed the vibration limits outlined in the City of Toronto By-law No. 514-2008 or that may cause structural damage should be monitored. These recommendations are consistent with the mitigation measures outlined in the Noise and Vibration Impact Assessment which forms part of the EPR for this Project. A Noise and Vibration Control Plan will be developed for the Project prior to construction. All measures outlined in the Noise and Vibration Control Plan should be implemented for the properties of known and potential CHVI that fall within the ZOI.

CHR #	Name/Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Impact	Mitigation
SP-6	Fort York National Historic Site of Canada	Part V Designation, OHA (By-Law 420-85) and National Historic Site of Canada	The City of Toronto provides the following general description of the property: “Fort York was the first heritage conservation district designated in Toronto. The Heritage Conservation District includes the grounds of Historic Fort York and a portion of the remaining undeveloped Garrison Common to the west of the Fort.”	Not within Vibration ZOI (property is >200m from Project footprint). No indirect adverse impacts identified.	No indirect adverse impacts identified. No mitigation measures are required.
Bloor-Lansdowne GO Station					
BL-1	158 Sterling Road (Northern Aluminum Company Building)	Part IV Designation, OHA (By-law 969-2005)	This property is designated under Part IV of the OHA (By-law 969-2005). “The heritage attributes of the Northern Aluminium Company Building are found on the exterior walls and roof. Rising 10 stories, the structure features flat slab construction with the concrete exposed on the north façade. A classically detailed penthouse rises from the flat roof. The tripartite organization of the walls incorporates a two-storey base (currently reclad), a shaft with exposed concrete columns and brick infill, and an attic storey with a concrete cornice with dentils and a band course. Flat-headed openings mark all the elevations.”	Not within Vibration ZOI (structure is >15m from Project footprint). No indirect adverse impacts identified.	No indirect adverse impacts identified. No mitigation measures are required.
BL-2	222 Lansdowne Avenue (National Cash Register Company)	Part IV Designation, OHA (By-law 436-2003)	This property is designated under Part IV of the OHA (By-Law 0436-2003). The CHVI of the property lies in the c.1935 to 1936 structure’s association with the National Cash Register Company and the building’s design by Toronto architect, Thomas E. Muirhead. The by-law provides the following description of the physical features (heritage attributes) included in the designation: “Rising from smooth masonry foundations, the National Cash Register Company Building features a singlestorey rectangular plan with stone coping along the flat roofline. The principal (east) façade and side walls (north and south) are clad in yellow brick, with limestone detailing applied for the entrance surround, window sills, band courses and dentils. The principal façade features a tripartite design with a central projecting frontispiece that is	Not within Vibration ZOI (structure is >25m from Project footprint). No indirect adverse impacts identified.	No indirect adverse impacts identified. No mitigation measures are required.

CHR #	Name/Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Impact	Mitigation
			stepped above the flanking end pavilions. The three sections of the façade are linked by continuous band courses with dentils that extend above the door and window openings. The main entrance is positioned in the frontispiece. Double doors (the original doors have been replaced) are set in a stone surround that rises the height of the wall (the company's name was originally applied in bas-relief above the doors). Flat-headed window openings are placed in trios to flank the entry. On either side, brick piers organize pairs of flat-headed window openings that contain steel sash windows. The band courses, coping and paired window openings wrap around the easterly two bays of the end (north and south) walls. The openings on the north elevation contain steel sash windows. The rear (west) wall of the original building and the additions are not included in the Reasons for Designation."		
BL-4	226 St Helens Avenue	None	The main resource of the property at 226 St Helens Avenue is a three-storey building with a two-storey addition situated on the southwest corner of St Helens Avenue and Dora Avenue. It is a 19th century residential building constructed with Stretcher Bond method out of red and yellow brick. The recommended outcome of the Cultural Heritage Evaluation of the property at 226 St Helens Avenue in the City of Toronto is that it does not meet the criteria set out under the criteria of O. Reg. 9/06 or 10/06.	N/A	No mitigation measures are required.
BL-5	Earlscourt Park	None	The property at Earlscourt Park was subject to a CHER. The Metrolinx Heritage Committee determined that the property **does not** warrant identification as a Conditional Heritage Property based on the evaluative criteria set forth in O. Reg. 9/06 and 10/06. However, as a matter of due diligence, the potential impacts on the potential CHVI of the property will be considered here. The potential CHVI of the property lies in: • The Earlscourt Park Shelter; • The large dimensiosn of the park; • The overall landscaped design; and • The sports track.	No anticipated impacts on any CHVI or heritage attributes.	No mitigation measures are required.

CHR #	Name/Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Impact	Mitigation
BL-6	87 Wade Avenue	None	This property has no previous heritage recognition. The potential CHVI and heritage attributes of the property are limited to the industrial structure and its physical features.	Potential heritage attributes are immediately adjacent to Project footprint. Within Vibration ZOI and may experience indirect effects as a result of construction vibrations.	In order to mitigate potential indirect impacts from construction vibrations, the following mitigation measures are recommended: • Pre-construction consultations between the applicant and owners/occupants; • Pre-construction measurements of background vibration levels; • Pre-condition survey by means of a photographic record of potentially affected structure façades and all surfaces, including visible sections of building foundations, building cladding, doors, windows, interior wall finishes, surface pavement, sidewalks, signs and trees. Each of the elements should be rated on their general condition (new, good, fair, poor, severe), and visible defects will be photographed; and • Work that may exceed the vibration limits outlined in the City of Toronto By-law No. 514-2008 or that may cause structural damage should be monitored. These recommendations are consistent with the mitigation measures outlined in the Noise and Vibration Impact Assessment which forms part of the EPR Addendum for this Project. A Noise and Vibration Control Plan will be developed for the Project prior to construction. All measures outlined in the Noise and Vibration Control Plan should be implemented for the properties of known and potential CHVI that fall within the ZOI.
BL-7	213 Sterling Road	None	This property has no previous heritage recognition. The potential CHVI and heritage attributes of the property are limited to the industrial structure and its physical features.	Not within Vibration ZOI (structure is >8m from Project footprint). No indirect adverse impacts identified.	No indirect adverse impacts identified. No mitigation measures are required.
BL-8	163 Sterling Road	None	This property has no previous heritage recognition. The potential CHVI and heritage attributes of the property are limited to the industrial structure and its physical features.	Potential heritage attributes are immediately adjacent to Project footprint. Within Vibration ZOI and may experience indirect effects as a result of construction vibrations.	In order to mitigate potential indirect impacts from construction vibrations, the following mitigation measures are recommended: • Pre-construction consultations between the applicant and owners/occupants; • Pre-construction measurements of background vibration levels; • Pre-condition survey by means of a photographic record of potentially affected structure façades and all surfaces, including visible sections of building foundations, building cladding, doors, windows, interior wall finishes, surface pavement, sidewalks, signs and trees. Each of the elements should be rated on their general condition (new, good, fair, poor, severe), and visible defects will be photographed; and

CHR #	Name/Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Impact	Mitigation
					• Work that may exceed the vibration limits outlined in the City of Toronto By-law No. 514-2008 or that may cause structural damage should be monitored. These recommendations are consistent with the mitigation measures outlined in the Noise and Vibration Impact Assessment which forms part of the EPR Addendum for this Project. A Noise and Vibration Control Plan will be developed for the Project prior to construction. All measures outlined in the Noise and Vibration Control Plan should be implemented for the properties of known and potential CHVI that fall within the ZOI.
Kirby GO Station					
KI-1	2480 Kirby Road	Listed	The City of Vaughan provided the following description of the property: "2480 Kirby Road is included on the City of Vaughan Municipal Heritage Register. It features a bi-colour brick dwelling in the Ontario Gothic Revival style aka Ontario Cottage Style and is thought to have been built between 1860-1895. It is also a property that is associated with the former village community of Hope." The CHVI and heritage attributes are limited to the extant farmhouse structure and former farmyard.	Not within Vibration ZOI (structures are >300m from Project footprint). No indirect adverse impacts identified.	No mitigation measures are required.
KI-2	11390 Keele Street	Included on City of Vaughan Cultural Heritage Inventory	The recommended outcome of the Cultural Heritage Evaluation of 11390 Keele Street (ERA 2018) is that it does not meet the criteria set out under the criteria of O. Reg. 9/06 or O. Reg. 10/06.	N/A	No mitigation measures are required.
KI-3	11320 Keele Street	None.	This property has no previous heritage recognition. The potential CHVI and heritage attributes of the property are limited to the pre-1954 residential structure and its physical features.	Not within Vibration ZOI (structure is >60m from Project footprint). No indirect adverse impacts identified.	No mitigation measures are required.
Mulock GO Station					
-	No properties with CHVI identified	-		-	-
Innisfil GO Station					
IN-1	1350 6th Line	Part IV Designation, OHA (By-Law 037-11)	The designation by-law provides the following description of the property: "The stately farmhouse is located on the north side of the 6th Line Innisfil, east of the 20th Sideroad, and is crafted in	Directly Affected Property	A CHER (to evaluate the property against O. Reg.10/06 criteria) and HIA are required to be completed during detailed design.

CHR #	Name/Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Impact	Mitigation
			the “Georgian” style of architecture which became popular in England during the reigns of George I to IV from 1714 to 1830 and thus named after them. Local builders in Ontario added their own touches to this architecture including elements from other styles; hence the term Georgian “vernacular” (or local) style was created. The farmhouse was built in 1867 by the Sawyer family and has been owned by four generations of Sawyers, with Lloyd Sawyer and wife Isabel (Shipley) being the last ot occupy this property until 1953.” The heritage attributes are limited to the farmhouse and its physical features.		
IN-2	John Cowan Overpass	None.	The recommended outcome of the Cultural Heritage Evaluation of the John Cowan Overpass along 6th Line over the Barrie rail corridor in the Town of Innisfil is that it does not meet the criteria under O. Reg. 9/06 or O. Reg. 10/06 of the OHA.	N/A	No mitigation measures are required. In the event that this bridge is replaced as part of this Project, commemoration of John Cowan’s contributions to the community should be transferred to the new structure.
IN-3	1323 6th Line	None	The recommended outcome of the Cultural Heritage Evaluation of the property at 1323 6th Line is that it does not meet the criteria set out under O. Reg. 9/06 or O. Reg. 10/06 of the OHA.	N/A	No mitigation measures are required.

Operations and maintenance – All GO Stations

No mitigation measures are required during the operations and maintenance phase.

4.3.4.3 *Monitoring Activities*

Construction – All GO Stations

With respect to 1350 6th Line (IN-1), the HIA may identify monitoring recommendations. These monitoring recommendations will be implemented.

Vibration monitoring recommendations were made for the following properties within the vibration ZOI:

- Spadina-Front GO Station:
  - Draper Street HCD properties (SP-2); and
  - 532/530 Front Street West (SP-5).
- Bloor-Lansdowne GO Station:
  - 87 Wade Avenue (BL-6); and
  - 163 Sterling Road (BL-8).

Work that may exceed the vibration limits outlined in the City of Toronto By-law No. 514-2008 (all of the abovenoted properties are located in the City of Toronto) or that may cause structural damage should be monitored.

Operations and Maintenance – All GO Stations

No monitoring activities are required during the operations and maintenance phase.

4.3.5 *Socio-Economic Environment and Land Use*

4.3.5.1 *Potential Effects*

The SELUS' provided in Appendix F of Volume 2 through Volume 6 of this EPR Addendum were prepared to evaluate potential effects related to socio-economic and land use characteristics that could occur as a result of the Spadina-Front, Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations.

Pre-Construction Land Clearing/Property Acquisition – All GO Stations

Existing Land Use, Community Services, Amenities and Resources:

The GO Stations were designed to limit the need for land acquisition. Attempts were also made to avoid potential effects to sensitive land uses and small urban properties. Land acquisition information is based on data from January 2018. At the time of writing this EPR Addendum, discussions with Metrolinx, conservation authorities, and municipalities were ongoing related to acquisition of lands.

In order to accommodate the GO Stations, properties will need to be acquired (as temporary easements, permanent easements, or fee simple acquisitions, for purposes including pedestrian access, road widening, station infrastructure, road access, construction) as follows:

- Spadina-Front GO Station – No acquisition requirement anticipated;
- Bloor-Lansdowne GO Station – Approximately 1.0 ha of land zoned as mixed use, approximately 0.05 ha of land zoned as utility/transportation, and approximately 0.5 ha of land zoned as industrial;
- Kirby GO Station – Approximately 8.1 ha of land zoned as agricultural;
- Mulock GO Station – Approximately 8.6 ha of land zoned as employment and approximately 0.3 ha of land zoned as commercial; and
- Innisfil GO Station – Approximately 6.4 ha of land zoned as agricultural and approximately 0.08 ha of land zoned as open space.

These property acquisitions will result in direct loss of property; direct loss of active agricultural land; potential altered property value in the surrounding area outside the GO Station footprints (i.e., off-site buffer area); decreased future development potential in the surrounding off-site buffer area; loss of customer parking or reduced delivery areas for commercial lands; loss of existing vegetation or other visual effects which currently screen views of the Barrie rail corridor; and loss of secondary structures and amenity areas. Further details regarding the potential effects to individual property owners due to the implementation of the GO Stations are discussed in Appendix F of Volume 2 through Volume 6 of this EPR Addendum.

Current Development Applications:

Potential conflicts may occur with development applications situated within some of the GO Station study footprints. These were identified by the City of Toronto (Spadina-Front and Bloor-Lansdowne GO Stations), City of Vaughan (Kirby GO Station), Town of Newmarket (Mulock GO Station) and Town of Innisfil (Innisfil GO Station) Planning Departments. These are summarized in Table 4-7.

Table 4-7: Summary of Potential Development Application Conflicts

Address	Description	Status
Spadina-Front GO Station		
433 Front Street West	No potential conflict is foreseen. Development of the Spadina-Front GO Station requires coordination for the development at 433 Front Street West, as it involves a rail corridor overbuild (deck) of the existing active rail corridor to accommodate development, while maintaining the rail activities.	Under Review
Bloor-Lansdowne GO Station		
158 Sterling Road	Site Plan Application for a large redevelopment with eight blocks of development – Official Plan and Rezoning Amendments approved at OMB, two site plan	Site Plan Approval under review, Rezoning, Application for Consent and Minor Variance

Address	Description	Status
	approval applications on hold, draft plan of subdivision under OMB/LPAT appeal.	closed, Subdivision Approval appealed
1800 Davenport Road	Proposed single-storey industrial units.	Under Review by the City of Toronto
Kirby GO Station		
None	-	-
Mulock GO Station		
Western terminus of Silken Laumann Drive, west of the hydro corridor	Official Plan Amendment (OPA), a Zoning By-law Amendment, a Draft Plan of Subdivision and a Plan of Condominium.	OPA referred to LPAT. Zoning By-law referred to LPAT. Draft Plan of Subdivision Approved. Plan of Condominium Pending.
Innisfil GO Station		
None	-	-

Construction – All GO Stations

Existing Land Use, Community Services, Amenities and Resources:

Vehicle, Agricultural, Pedestrian, and Cyclist Traffic: Construction may result in the need for temporary road or lane closures causing access restrictions and detours to nearby residences, parks, businesses, institutions, and local transit routes. Whenever possible, road construction activities will occur during the day instead of at night. Pedestrians and cyclists may be negatively impacted by partial lane closures as they may be required to detour to avoid construction areas. Vehicles may be detoured. Delays at all intersections along the detour routes will be a result of additional detoured traffic volumes. These impacts and associated mitigation measures are further described in the TTIAs (Appendix I of Volume 2 through Volume 6 of the EPR Addendum).

All Land Uses: Temporary nuisance effects from increased noise, vibration, and dust (and associated diminished air quality conditions), may be experienced on lands in close proximity to the GO Stations. Nearby residents, businesses, and institutions may experience nuisance effects resulting from increased noise and vibration levels due to construction equipment and other construction related activities. Enjoyment of public and private recreational uses within the GO Station study areas may be affected by increased noise levels due to construction equipment and other construction related activities. Air quality effects to lands surrounding the GO Stations are documented in the AQIAs (EPR Addendum, Volume 2 through Volume 6,

Appendix G). Expected noise and vibration effects are documented in the NVIAs (EPR Addendum, Volume 2 through Volume 6, Appendix H).

Temporary use of adjacent lands may be required for construction purposes (i.e., access, establishment of equipment storage/staging/laydown areas, stockpiling of materials, etc.) through the use of construction easements or Temporary Limited Interests (TLIs). This too will affect all land uses whereby the lands are used for the purpose of entering on and occupying the land with all necessary vehicles, machinery, equipment and other material required to carry out the construction effort.

Utilities: The possible relocation and/or service interruptions to nearby properties may be required during the Project construction phase. Protection of utility infrastructure may also be necessary. These effects could be either temporary or permanent.

Existing Visual Characteristics:

All Land Uses: Properties of all land use types may experience temporary visual and aesthetic effects as a result of temporary storage sites for equipment, staging/laydown areas, stockpiling of materials and other construction activities. During construction, trees within the existing Barrie rail corridor and newly acquired lands for the GO Stations will need to be removed; the number and location of trees is described in the TIPs (EPR Addendum, Volume 2 through Volume 6, Appendix C), and will be finalized during the detailed design. This may result in the loss of a visual buffer that previously screened views of these corresponding areas. Tree removal may pose undesirable aesthetic effects on all land uses, including residences, businesses, institutions and parks. Viewscapes may also be affected for sensitive businesses such as restaurants with outdoor patios. There may be some longer term visual effects resulting from the removal of trees that currently provide a visual buffer from the Barrie rail corridor.

Socio-Economic Policies and Planning Context:

- Spadina-Front GO Station
  - No zoning conflicts anticipated for the City of Toronto Zoning By-Law 569-2013 and the Former City of Toronto Zoning By-Law 438;
  - City of Toronto OP – The GO Station is in accordance with planned land uses and urban structure designations in the GO Station footprint; and
  - Toronto Region Conservation Authority (TRCA) – There is no watercourse in the Spadina-Front study areas, nor are the areas located within the regulation limits of the TRCA.
- Bloor-Landsowne GO Station
  - According to the City of Toronto Zoning By-Law 569-2013 and the Former City of Toronto Zoning By-Law 438-86, lands within the GO Station footprint are zoned as residential, open space, employment industrial, and commercial, which is not consistent with a proposed station;

- City of Toronto OP – The GO Station is in accordance with planned land uses and urban structure designations in the GO Station footprint; and
- Toronto Region Conservation Authority (TRCA) – There is no watercourse in the Bloor-Lansdowne study areas, nor are the areas located within the regulation limits of the TRCA.

- Kirby GO Station
  - Provincial Policy Statement (PPS) – Presence of one PSW (Don River West Branch Headwater Wetland Complex) and one woodland in the Kirby study area documented by the MNRF. Effects to key natural heritage features (KNHFs) are documented in the NER (EPR Addendum, Volume 4, Appendix B);
  - The Greenbelt Plan area is outside of the Kirby GO Station footprint area therefore the Kirby GO Station is not required to follow the authority of the *Greenbelt Act*, 2017;
  - The Oak Ridges Moraine Conservation Plan, 2017 (ORMCP) area is located outside of the Kirby GO Station footprint. As such, the Kirby GO Station is not required to follow the authority of the *Oak Ridges Moraine Conservation Act*, 2001 (ORMCA);
  - According to the City of Vaughan Zoning By-law 1-88, lands at the Kirby GO Station footprint are zoned as agricultural, which is not consistent with a proposed station;
  - City of Vaughan Official Plan 2010 (VOP 2010) – The GO Station is in accordance with planned land uses in the Kirby GO Station footprint; and
  - TRCA – The Kirby GO Station study area is mapped within the authority's regulated area.
- Mulock GO Station
  - According to the Town of Newmarket Zoning By-law 2010-40, part of the lands within the Mulock GO Station footprint are zoned as Regulated Area and Other Natural Hazards Zone and as Flood Plain, which is not consistent with a proposed station;
  - Town of Newmarket OP – The GO Station is in accordance with planned land uses in the Mulock GO Station footprint;
  - LSRCA – A portion of the GO Station footprint area is within the LSRCA regulated limit; and
  - Temporary disruption to natural areas under the LSRCA jurisdiction, longer-term visual effects from construction – further details in the NER (EPR Addendum, Volume 5, Appendix B).
- Innisfil GO Station
  - According to the Town of Innisfil Comprehensive Zoning By-Law 080-13, lands in the Innisfil GO Station footprint are zoned as agricultural, open space, and residential rural, which is not consistent with a proposed station;

- County of Simcoe OP – The GO Station is in accordance with public transit-supportive policies. In addition, the County OP (2016) also recognizes the importance of limiting incompatible development adjacent to rail facilities, such as the existing Barrie rail corridor and the proposed Innisfil GO Station;
- Town of Innisfil OP – The GO Station is in accordance with planned land uses in the Innisfil GO Station footprint: “Rural Area”;
- LSRCA– The GO Station falls under the LSRCA jurisdiction but is not within the LSRCA regulated limit; and
- Potential effects of the Innisfil GO Station on the LSPP area and KNHF zones are discussed in the NER presented in Appendix B of Volume 6 of the BRCE EPR Addendum.

Operations and Maintenance – All GO Stations

Population and Economic Characteristics:

Once operational, the GO Stations will provide access to new job opportunities for those who could not previously travel beyond their local neighbourhood. The GO Stations will allow citizens to reduce vehicle gasoline costs, vehicle maintenance, insurance and other automobile related costs. It will improve the quality of life for local citizens by providing them with personal mobility and freedom by offering transportation options and will improve community health by supporting walkable communities and decreasing respiratory health concerns associated with automotive air pollution.

Existing Land Use, Community Services, Amenities and Resources:

All Land Uses: Property values tend to increase for properties located in close proximity to transit facilities as transit service increases, resulting in a positive effect.

Light spillage effects may occur from lighting at the GO Stations, including at GO Station access points.

Effects from increased noise, vibration, and dust (including diminished air quality conditions) on lands in close proximity to the GO Stations from GO Station operations are deemed to be insignificant. Air quality effects to lands surrounding the GO Stations are documented in the AQIAs (EPR Addendum, Volume 2 through Volume 6, Appendix G). Expected noise and vibration effects are documented in the NVIAs (EPR Addendum, Volume 2 through Volume 6, Appendix H).

Vehicle, Agricultural, Pedestrian, and Cyclist Traffic: Vehicle, agricultural, pedestrian and cyclist traffic effects are documented in the TTIAs (EPR Addendum, Volume 2 through Volume 6, Appendix I). Illegal parking at surrounding streets may result from insufficient parking spaces. Opening of the GO Stations is expected to have a positive effect on pedestrians and cyclists by providing accessible public transit and encouraging active transportation through a connection to the future TransCanada Pipeline Trail. Congestion and increased vehicle volumes in the GO Station study areas may have a negative effect on pedestrian and cyclist

comfort. Pedestrian and cyclist trips are expected to have a minor effect on traffic operations in the GO Station study areas.

Existing Visual Characteristics:

All Land Uses: Existing visual characteristics will be modified with the presence of the GO Stations. Light spillage effects may occur from lighting at the GO Stations required for both the GO Stations themselves, as well as ancillary infrastructure. Light reflected on trains at night may increase light spillage into adjacent properties. GO Station buildings and other components may be visible from the streets and buildings, changing the viewscapes for nearby residents and visitors to the area.

Crime prevention through environmental design (CPTED) may become more effective as a result of increased lighting and increased pedestrian and cycling movement near the GO Stations.

Socio-Economic Policies and Planning Context:

The GO Station operations will be in accordance with socio-economic and land use policies and planning context:

- Provincial Policy Statement (PPS) – the Project will support a multimodal system as it will provide connectivity to local and regional transit;
- Growth Plan for the Greater Golden Horseshoe (GPGGH) – the Project will provide opportunity for connecting people and goods through a multimodal and efficient transportation network. The Project will also support the local municipalities' direction to accommodate future growth, while also providing infrastructure to promote active transportation;
- Regional Transportation Plan (RTP) – the Project will accommodate growth and development in accordance with the RTP and the 2041 Draft RTP; and
- Barrie Corridor Planning Study – the Project will serve as an infrastructure improvement as identified within the study.

The GO Stations are generally in accordance with municipal OPs planned growth and transit-supportive policies.

4.3.5.2 Mitigation Measures

Pre-Construction Land Clearing/Property Acquisition – All GO Stations

Existing Land Use, Community Services, Amenities and Resources:

All Land Uses: Metrolinx is establishing a Vegetation Compensation Protocol for RER Projects. Vegetation that is removed will be compensated for in accordance with this Protocol, as documented in the TIPs (EPR Addendum, Volume 2 through Volume 6, Appendix C). Where appropriate, Metrolinx will seek to develop an aesthetically pleasing design for public facing infrastructure in consultation with affected municipalities and adjacent landowners.

Residential, Agricultural and Commercial Land Uses: Metrolinx will confirm specific property requirements prior to GO Station construction to determine predicted property impacts. Metrolinx will engage and negotiate with affected property owners regarding land acquisition and easements/TLIs required for the proposed works, and provide fair market value compensation to affected property owners in accordance with applicable laws.

Current Development Applications:

Metrolinx will confirm potential conflicts with the proposed development applications and engage and negotiate with appropriate parties regarding land acquisition in advance of GO Station construction.

Construction – All GO Stations

Existing Land Use, Community Services, Amenities and Resources:

Vehicle, Agricultural, Pedestrian, and Cyclist Traffic: Mitigation measures for nuisance effects from dust and noise/vibration will be implemented as documented in the TTIAs (EPR Addendum, Volume 2 through Volume 6, Appendix I). Adequate construction hauling routes will be determined in consultation with the affected municipalities. Site-specific Traffic Control and Management Plans will be prepared and implemented prior to GO Station construction to maintain reasonable access through work zones, as much as possible. Where it is not possible to maintain access, Metrolinx will consult directly with the affected property owners to establish a suitable mitigation strategy to be implemented.

All Land Uses: Mitigation measures will be taken as documented in the AQIAs (EPR Addendum, Volume 2 through Volume 6, Appendix G) and in the NVIAs (EPR Addendum, Volume 2 through Volume 6, Appendix H). Construction BMPs will be utilized to minimize any adverse effects from construction noise, vibration, and dust effects at nearby sensitive receptors. Construction work for “major transit projects” are not restricted to municipal noise by-laws. However, Metrolinx has committed to noise mitigation measures around timing including: whenever possible, road construction activities will occur during the day instead of at night; and if construction needs to be undertaken outside of the normal daytime hours, local residents and municipalities will be informed beforehand of the type of construction planned and the expected duration.

Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts. All stockpiled materials will be fenced and the construction footprint area will be minimized to prevent the construction zone from extending beyond that which is necessary.

A review will be completed prior to construction to identify temporary easements and/or TLIs for construction or other purposes to accommodate the GO Station work. Construction will be planned to limit the need for construction easements/TLIs to the extent possible. Construction laydown areas and easements/TLIs will be selected to minimize effects to the extent possible (i.e., vacant lands and industrial lands will be used as much as possible). Metrolinx will engage with affected land owners regarding easements/TLIs required for the proposed works in advance of GO Station construction.

Utilities: All temporary utility support and utility protection designs will achieve deflection requirements as well as horizontal and vertical clearance requirements of the utility authority for the protection of the utility. Coordination with the appropriate regional or municipal authority and utility authorities will be scheduled to ensure that all the necessary approvals and permits are obtained without delay to the construction schedule. Prior to the commencement of any operation affecting their system, the appropriate regional or municipal authority will be provided a notice of intention to commence the Work. A Designated Substances Survey for any structures that require demolition will be undertaken. All abatement/ management plans for these substances will be developed in accordance with the Occupational Health and Safety Act (OHSA), R.S.O. 1990 (MOL) and regulations. The Design-Builder will be required to obtain locates for underground utilities prior to commencing construction works and to report any discrepancies between locate information and the Agreement to Metrolinx. If any utility-related redesign is requested by the Design-Builder for their convenience, the Design-Builder will be responsible for acquiring the design approval from Metrolinx and the authority having jurisdiction.

Existing Visual Characteristics:

All Land Uses: Construction schedule delays will be avoided to the extent possible to minimize construction duration and corresponding visual impacts. All stockpiled materials will be fenced, and the construction footprint area will be minimized to the extent practical to prevent the construction zone from extending beyond that which is necessary.

Metrolinx is currently establishing a Vegetation Compensation Protocol for RER Projects. As such, vegetation that is removed will be compensated for in accordance with this Protocol as documented in the TIPs (EPR Addendum, Volume 2 through Volume 6, Appendix C).

Socio-Economic Policies and Planning Context:

Metrolinx, as a Provincial Crown Agency, is not generally subject to municipal permitting and approval requirements; regardless, Metrolinx works in co-operation with local municipalities to adhere to the intent of the relevant permit/approval requirements as they relate to potential zoning conflicts to the extent possible.

Operations and Maintenance – All GO Stations

Population and Economic Characteristics:

As there are no predicted effects during the operations and maintenance phase, no mitigation is required.

Existing Land Use, Community Services, Amenities and Resources:

All Land Uses: Operations will be carried out in accordance with applicable regulations and standards, including Ontario's ambient air quality criteria (AAQC) (PIBS#6570e01) (MOE, 2012), MOEE/GO Transit Noise and Vibration Protocol (MOEE, 1994) and the Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning Publication NPC-300 (MOECC, 2013). Mitigation measures related to noise, vibration and air quality will be implemented as described in Sections 4.3.6, 4.3.7 and 4.3.8 of this EPR Addendum, and

further in the AQIAs and the NVIAs (EPR Addendum, Appendix G and Appendix H of Volume 2 through Volume 6, respectively). The future use of electric trains on the Barrie rail corridor will further reduce air quality effects. Additional mitigation measures to reduce noise effects will be developed as part of detailed design, as required, based on noise modelling and projections. Mitigation measures related to transportation and traffic will be implemented as documented in the TTIAs (EPR Addendum, Volume 2 through Volume 6, Appendix I).

Existing Visual Characteristics:

All Land Uses: Where appropriate, Metrolinx will seek to develop an aesthetically pleasing design for public-facing infrastructure in consultation with municipalities and/or adjacent landowners. Light spillage will be taken into consideration in the detailed design stage of the GO Stations. Lighting will be minimized and controlled to prevent light spillage beyond the property line, as well as light pollution in the sky at night. In this regard, mitigation measures may include, but are not limited to:

- External visors on floodlights;
- Optimal light location, height and settings;
- Light shields such as walls of hedges;
- Various intensities and control of lighting of the GO Stations for different scenarios (i.e., a train passing by and reflecting light into the sky and onto neighbouring properties); and
- Shielded fixtures with efficient light bulbs surrounding the GO Stations.

Socio-Economic Policies and Planning Context:

As there are no predicted effects during the operations and maintenance phase, no mitigation is required.

4.3.5.3 Monitoring Activities

Pre-Construction Land Clearing/Property Acquisition – All GO Stations

Existing Land Use, Community Services, Amenities and Resources:

Residential, Agricultural and Commercial Land Uses: No monitoring activities are required.

Current Development Applications:

No monitoring activities are required.

Construction – All GO Stations

Existing Land Use, Community Services, Amenities and Resources:

Vehicle, Agricultural, Pedestrian, and Cyclist Traffic: Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction zones. Pedestrian and cyclist access areas within the construction work zone will be monitored to ensure they remain clear of obstructions and barriers to accessibility.

All Land Uses: Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction work zones. Monitoring will continue throughout the construction phase until activities are complete; all exposed soils have been stabilized and all construction waste has been cleaned up.

Utilities: Utility requirements to be monitored in conjunction with the detailed GO Station design and constructions requirements.

Existing Visual Characteristics:

All Land Uses: Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction work zones. Monitoring will continue throughout the construction phase until activities are complete, all exposed soils have been stabilized and all construction waste has been cleaned up. New planting will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects. Consultation with the affected municipalities and adjacent land owners will continue during construction.

Post-construction monitoring activities and timing will be confirmed as part of the Vegetation Compensation Protocol for Metrolinx RER Projects to be developed through the detailed design process. A Landscape Architect (licensed in the Province of Ontario) or qualified designate will be required to confirm the success of plant establishment through warranty inspections.

Socio-Economic Policies and Planning Context:

Metrolinx will work collaboratively with the affected municipalities to minimize effects on socio-economic features and existing land uses.

Operations and Maintenance – All GO Stations

Population and Economic Characteristics:

No monitoring activities are required.

Existing Land Use, Community Services, Amenities and Resources:

All Land Uses: Metrolinx will maintain ongoing inspection schedules to monitor the effectiveness of its GO Transit operations. Metrolinx's existing complaints procedure is in place to address any concerns raised by neighbouring land owners, the affected municipalities and/or the public. Ridership, intersection operations, parking demand, and transit stops at the GO Stations will be monitored.

Existing Visual Characteristics:

All Land Uses: Metrolinx will continue its ongoing inspection program to monitor the effectiveness of its GO Transit operations.

Socio-Economic Policies and Planning Context:

No monitoring activities are required.

4.3.6 Air Quality

4.3.6.1 Potential Effects

In summary, results of the dispersion modelling show that the Spadina-Front, Bloor-Lansdowne GO Station, Kirby, Mulock, and Innisfil GO Stations will not have a significant effect on local air quality. The Current scenario (2017) indicates that the emissions from the operation of the Barrie rail corridor are mostly negligible at the selected sensitive and critical receptors. The modelling results indicate that the Future No-Build scenario will have the least effect on air quality within all GO Station study areas. The Project's contribution is null when considering full electrification of the Barrie rail corridor offset by the air emissions associated with buses and/or passenger vehicles entering/exiting and circulating within the GO Station sites. The effects on air quality are deemed insignificant based on the small increases in ambient concentrations for most of the contaminants. The new annual limit for NO_2 is exceeded by the background concentrations at the Spadina-Front GO Station without considering any contribution from the Spadina-Front GO Station[20]. The predicted cumulative concentrations of B(a)P will exceed daily and annual limit values. These exceedances are attributed to high background levels that are currently significantly exceeding the limits for B(a)P. For the Kirby GO Station for Benzene specifically, these exceedances are also attributed to high background levels that are currently close to exceeding the limit values for Benzene. These predicted exceedances for Benzene and B(a)P are observed across the province, it is not a local issue and is not specific to this project. Expected impacts are shown in Table 4-8, Table 4-9, Table 4-10, Table 4-11 and Table 4-12.

Potential air quality effects associated with the new Spadina-Front GO Station for the future scenarios are mainly caused by the increased deceleration, acceleration and total travel time through the Spadina-Front study area of the remaining diesel trains due to the change of speed profiles from the new Spadina-Front GO Station.

Potential air quality effects associated with the new Bloor-Lansdowne GO Station for the future scenarios are mainly caused by the remaining diesel locomotives that will be travelling in the Bloor-Lansdowne study area (Milton rail corridor and Kitchener rail corridor).

Potential air quality effects associated with the new Kirby, Mulock and Innisfil GO Stations for the future scenarios are only caused by vehicles and buses that will circulate in the Kirby, Mulock, and Innisfil study areas.

[20] The Spadina-Front GO Station assessment was based on the CAAQS limit (24 µg/m^3) rather than the AAQS limit (60 µg/m^3). The result is more conservative based on the CAAQS.

Table 4-8: Summary of Expected Air Quality Impacts – Spadina-Front GO Station

Contaminant	Receptor ID	Averaging Period	Background Values (µg/m³)	Current 2017 Cumulative Concentrations (Maximum) (µg/m³)	Future No-Build (2028) Cumulative Concentrations (Maximum) (µg/m³)	Future Build (2028) Cumulative Concentrations (Maximum) (µg/m³)	Air Quality Threshold (µg/m³)	Percent of Threshold 2017	Percent of Threshold Future No-Build (2028)	Percent of Threshold Future Build (2028)
CO	R1	1-HR	441	441	441	442	36,200	1.2	1.2	1.2
	R1	8-HR	424	424	424	424	15,700	2.7	2.7	2.7
NO_2	R1	1-HR	49.1	51.5	50.6	50.9	400	12.9	12.6	12.7
	R1	24-HR	40.9	41.6	41.1	41.3	200	20.8	20.6	20.6
	R1	ANNUAL	27.7	27.9	27.76	27.81	24	-	**115.7**	**115.9**
$PM_{2.5}$	R1	24-HR	14	14.31	14.01	14.01	27	53	51.9	51.9
	R1	ANNUAL	8.7	8.78	8.7	8.7	8.8	99.8	98.9	98.9
Benzene	R1	24-HR	1	1	1	1	2.3	43.6	43.5	43.5
	R1	ANNUAL	0.8	0.8	0.8	0.8	0.45	**177.9**	**177.8**	**177.8**
1,3-Butadiene	R1	24-HR	0.1	0.1	0.1	0.1	10	1	1	1
	R1	ANNUAL	0.05	0.05	0.05	0.05	2	2.7	2.7	2.7
Formaldehyde	R1	24-HR	4	4.02	4	4	65	6.2	6.2	6.2
Acetaldehyde	R1	1/2-HR	N/A	1.10E-02	1.00E-03	1.30E-03	500	N/A	N/A	N/A
	R1	24-HR	2	2.01	2	2	500	0.4	0.4	0.4
Acrolein	R1	1-HR	N/A	5.00E-03	4.50E-04	6.20E-04	4.5	N/A	N/A	N/A
	R1	24-HR	0.2	0.2	0.2	0.2	0.4	50.3	50	50
B(a)P	R1	24-HR	0.000128	0.000129	0.000128	0.000128	0.00005	**257.5**	**256.0**	**256.0**
	R1	ANNUAL	0.000082	0.0000822	0.000082	0.000082	0.00001	**821.9**	**820.0**	**820.1**

Table 4-9: Summary of Expected Air Quality Impacts – Bloor-Lansdowne GO Station

Contaminant	Receptor ID	Averaging Period	Background Values (µg/m³)	Current 2017 Cumulative Concentrations (Maximum) (µg/m³)	Future No-Build (2028) Cumulative Concentrations (Maximum) (µg/m³)	Future Build (2028) Cumulative Concentrations (Maximum) (µg/m³)	Air Quality Threshold (µg/m³)	Percent of Threshold 2017	Percent of Threshold Future No-Build (2028)	Percent of Threshold Future Build (2028)
CO	R12	1-HR	457	480	473	473	36,200	1.3	1.3	1.3
	R12	8-HR	440	460	447	447	15,700	2.9	2.8	2.8
NO_2	R12	1-HR	50.9	110.8	65.8	65.8	400	27.7	16.4	16.4
	R12	24-HR	42.8	61.7	45.2	45.2	200	30.8	22.6	22.6
	R12	ANNUAL	27.7	33.7	28.5	28.5	60	56.2	47.6	47.6
$PM_{2.5}$	R12	24-HR	14.1	14.5	14.2	14.2	27	53.6	52.5	52.5
	R12	ANNUAL	7.7	7.83	7.73	7.73	8.8	89	87.8	87.8
Benzene	R12	24-HR	1.03	1.04	1.03	N/A	2.3	45.4	44.9	N/A
	R14	24-HR	1.03	N/A	N/A	1.03	2.3	N/A	N/A	44.9
	R12	ANNUAL	0.67	0.67	0.67	0.67	0.45	**150**	**149.1**	**149.1**
1,3-Butadiene	R12	24-HR	0.11	0.11	0.11	N/A	10	1.1	1.1	N/A
	R14	24-HR	0.11	0.11	N/A	0.11	10	1.1	N/A	1.1
	R12	ANNUAL	0.06	0.06	0.06	N/A	2	3	3	N/A
	R14	ANNUAL	0.06	0.06	N/A	0.06	2	3.0	N/A	3.0
Formaldehyde	R12	24-HR	4.21	4.29	4.23	4.23	65	6.6	6.5	6.5
Acetaldehyde	R12	½-HR	N/A	5.20E-02	3.00E-02	3.00E-02	500	0.01	0.01	0.01
	R12	24-HR	1.55	1.58	1.56	1.56	500	0.3	0.3	0.3
Acrolein	R12	1-HR	N/A	1.30E-02	6.90E-03	6.90E-03	4.5	0.3	0.2	0.2
	R12	24-HR	0.24	0.24	0.24	0.24	0.4	60.2	59.1	59.1
B(a)P	R12	1-HR	1.28E-04	1.30E-04	1.28E-04	N/A	5E-05	**259**	**257**	N/A
	R14	1-HR	1.28E-04	N/A	N/A	1.29E-04	5E-05	N/A	N/A	**258**
	R12	24-HR	8E-05	8.30E-05	8.2E-05	N/A	1E-05	**826**	**821**	N/A
	R14	24-HR	8E-05	N/A	N/A	8.2E-05	1E-05	N/A	N/A	**821**

Table 4-10: Summary of Expected Air Quality Impacts – Kirby GO Station

Contaminant	Receptor ID	Averaging Period	Background Values (µg/m³)	Current 2017 Cumulative Concentrations (Maximum) (µg/m³)	Future No-Build (2028) Cumulative Concentrations (Maximum) (µg/m³)	Future Build (2028) Cumulative Concentrations (Maximum) (µg/m³)	Air Quality Threshold (µg/m³)	Percent of Threshold 2017	Percent of Threshold Future No-Build (2028)	Percent of Threshold Future Build (2028)
CO	R12	1-HR	457	461	457	2,567	36,200	1.3	1.3	7.1
	R12	8-HR	440	440	440	937	15,700	2.8	2.8	6
NO_2	R12	1-HR	30.4	106.9	30.4	76.1	400	26.7	7.6	19
	R12	24-HR	26.5	31.2	26.5	31	200	15.6	13.2	15.5
	R12	ANNUAL	14.0	14.3	14	14.2	60	23.9	23.3	23.7
$PM_{2.5}$	R12	24-HR	12.8	12.9	N/A	N/A	27	47.6	N/A	N/A
	R10	24-HR	12.8	12.8	12.8	15.1	27	47.4	47.4	55.9
	R12	ANNUAL	6.67	6.67	N/A	N/A	8.8	75.8	N/A	N/A
	R10	ANNUAL	6.67	6.67	6.67	6.88	8.8	75.8	75.8	78.2
Benzene	R12	24-HR	0.65	0.65	0.65	1.71	2.3	28.3	28.3	74.3
	R12	ANNUAL	0.44	0.44	0.44	0.5	0.45	97.8	97.8	**110.7**
1,3-Butadiene	R12	24-HR	0.05	0.05	0.05	0.28	10	1.5	1.5	2.8
	R12	ANNUAL	0.03	0.03	0.03	0.04	2	1.3	1.3	1.9
Formaldehyde	R12	24-HR	4.2	4.22	4.21	4.45	65	6.5	6.5	6.8
Acetaldehyde	R12	½-HR	N/A	2.50E-02	0	6.80E+00	500	<0.01	0	1.4
	R12	24-HR	2	1.55	1.55	2.08	500	0.3	0.3	0.4
Acrolein	R12	1-HR	N/A	6.20E-03	0	3.60E-01	4.5	0.1	0	7.9
	R12	24-HR	0.24	0.24	0.24	0.27	0.4	58.9	58.8	67
B(a)P	R12	24-HR	1.3E-04	1.28E-04	1.28E-04	4.72E-04	5E-05	**257**	**256**	**943**
	R12	ANNUAL	8E-05	8.2E-05	8.2E-05	1.0E-04	1E-05	**820**	**820**	**1013**

Table 4-11: Summary of Expected Air Quality Impacts – Mulock GO Station

Contaminant	Receptor ID	Averaging Period	Background Values (µg/m³)	Current 2017 Cumulative Concentrations (Maximum) (µg/m³)	Future No-Build (2028) Cumulative Concentrations (Maximum) (µg/m³)	Future Build (2028) Cumulative Concentrations (Maximum) (µg/m³)	Air Quality Threshold (µg/m³)	Percent of Threshold 2017	Percent of Threshold Future No-Build (2028)	Percent of Threshold Future Build (2028)
CO	R6	1-HR	457	457	457	996	36,200	1.3	1.3	2.8
	R6	8-HR	440	440	440	598	15,700	2.8	2.8	3.8
NO_2	R6	1-HR	30.4	32.5	30.4	42.1	400	8.1	7.6	10.5
	R6	24-HR	26.5	27.7	26.5	27.7	200	13.8	13.2	13.9
	R6	ANNUAL	14	14.1	14.0	14.1	60	23.5	23.3	23.5
$PM_{2.5}$	R6	24-HR	12.8	12.8	12.8	13.2	27	47.4	47.4	48.8
	R6	ANNUAL	6.67	6.67	6.67	6.75	8.8	75.8	75.8	76.7
Benzene	R6	24-HR	0.65	0.65	0.65	0.94	2.3	28.3	28.3	40.8
	R6	ANNUAL	0.44	0.44	0.44	0.46	0.45	97.8	97.8	**102.3**
1,3-Butadiene	R6	24-HR	0.05	0.05	0.05	0.11	10	0.5	0.5	1.1
	R6	ANNUAL	0.03	0.03	0.03	0.03	2	1.5	1.5	1.5
Formaldehyde	R6	24-HR	4.21	4.22	4.21	4.28	65	6.5	6.5	6.6
Acetaldehyde	R6	½-HR	N/A	8.38E-04	-	1.74	500	<0.01	-	0.3
	R6	24-HR	1.55	1.55	1.55	1.7	500	0.3	0.3	0.3
Acrolein	R6	1-HR	N/A	1.90E-04	-	9.09E-02	4.5	<0.01	-	2.0
	R6	24-HR	0.24	0.24	0.24	0.24	0.4	59	59	61
B(a)P	R6	24-HR	1.28E-04	1.3E-04	1.3E-04	2.2E-04	5E-05	**256**	**256**	**444**
	R6	ANNUAL	8.2E-05	8.2E-05	8.2E-05	9.0E-05	1E-05	**820**	**820**	**895**

Table 4-12: Summary of Expected Results – Innisfil GO Station

Contaminant	Receptor ID	Averaging Period	Background Values (µg/m³)	Current 2017 Cumulative Concentrations (Maximum) (µg/m³)	Future No-Build (2028) Cumulative Concentrations (Maximum) (µg/m³)	Future Build (2028) Cumulative Concentrations (Maximum) (µg/m³)	Air Quality Threshold (µg/m³)	Percent of Threshold 2017	Percent of Threshold Future No-Build (2028)	Percent of Threshold Future Build (2028)
CO	R4	1-HR	457	460	N/A	N/A	36,200	1.3	N/A	N/A
	R3	1-HR	457	458	457	3,667	36,200	1.3	1.3	10.1
	R3	8-HR	440	440	440	1,335	15,700	2.8	2.8	8.5
NO_2	R4	1-HR	30.4	99.7	N/A	N/A	400	24.9	N/A	N/A
	R3	1-HR	30.4	51.6	30.4	102.9	400	12.9	7.6	25.7
	R4	24-HR	26.5	34.7	N/A	N/A	200	17.3	N/A	N/A
	R3	24-HR	26.5	29.1	26.5	34.7	200	14.5	13.2	17.3
	R4	ANNUAL	14	15.3	N/A	N/A	60	25.4	N/A	N/A
	R3	ANNUAL	14	14.2	14	14.6	60	23.7	23.3	24.4
$PM_{2.5}$	R4	24-HR	12.8	12.9	N/A	N/A	27	47.9	N/A	N/A
	R3	24-HR	12.8	12.8	12.8	15.6	27	47.5	47.4	57.7
	R4	ANNUAL	6.67	6.69	N/A	N/A	8.8	76	N/A	N/A
	R3	ANNUAL	6.67	6.67	6.67	6.93	8.8	75.8	75.8	78.70
Benzene	R4	24-HR	0.7	0.65	N/A	N/A	2.3	28.4	N/A	N/A
	R3	24-HR	0.7	0.65	0.65	2.27	2.3	28.3	28.3	98.7
	R4	ANNUAL	0.44	0.44	N/A	N/A	0.45	97.9	N/A	N/A
	R3	ANNUAL	0.44	0.44	0.44	0.53	0.45	97.8	97.8	**118.6**
1,3-Butadiene	R4	24-HR	0.05	0.05	N/A	N/A	10	0.5	N/A	N/A
	R3	24-HR	0.05	0.05	0.05	0.41	10	0.5	0.5	4.1
	R4	ANNUAL	0.03	0.03	N/A	N/A	2	1.5	N/A	N/A
	R3	ANNUAL	0.03	0.03	0.03	0.05	2	1.5	1.5	2.3
Formaldehyde	R4	24-HR	4.21	4.22	N/A	N/A	65	6.5	N/A	N/A
	R3	24-HR	4.21	4.22	4.21	4.58	65	6.5	6.5	7
Acetaldehyde	R4	½-HR	N/A	2.76E-02	N/A	N/A	500	0.01	N/A	N/A
	R3	½-HR	N/A	8.52E-03	-	8.80E+00	500	<0.01	-	1.8
	R4	24-HR	N/A	1.56	N/A	N/A	500	0.3	N/A	N/A
	R3	24-HR	1.55	1.55	1.55	2.37	500	0.3	0.3	0.5
Acrolein	R4	1-HR	N/A	6.28E-03	N/A	N/A	4.5	0.1	N/A	N/A
	R3	1-HR	N/A	1.93E-03	-	0.54	4.5	<0.01	-	12.1
	R4	24-HR	0.24	0.24	N/A	N/A	0.4	59	N/A	N/A
	R3	24-HR	0.24	0.24	0.24	0.29	0.4	58.9	58.8	71.5
B(a)P	R4	24-HR	1.28E-04	1.29E-04	N/A	N/A	5E-05	**257**	N/A	N/A
	R3	24-HR	1.28E-04	1.28E-04	1.28E-04	6.44E-04	5E-05	**256.4**	**256**	**1,288**
	R4	ANNUAL	8.20E-05	8.21E-05	N/A	N/A	1E-05	**821**	N/A	N/A
	R3	ANNUAL	8.20E-05	8.20E-05	8.20E-05	1.1E-04	1E-05	**820**	**820**	**1,129**

Construction – All GO Stations

The GO Stations construction activities consist of the construction of new structures, platforms, walkways, pedestrian bridge, parking, access roads and landscaped areas. Therefore, air emissions associated with the GO Station construction will typically include:

- Fugitive dust emissions (TSP, PM_{10} and $PM_{2.5}$) resulting from:
  - Clearing and grubbing of the GO Station sites;
  - Soil excavation and filling activities required to facilitate the site layout for the GO Stations;
  - The demolition of structures necessary to accommodate the GO Stations;
  - Cutting of existing and new concrete;
  - Stockpiling of soil and other friable construction materials;
  - Granular material loading and unloading activities;
  - Transport of soils and other friable construction materials via dump trucks; and
  - Movement of heavy and light vehicles on paved and unpaved roads.
- Emissions resulting from the combustion engines of construction equipment and machinery on-site.

In addition to the above, construction activities will result in temporary traffic disruption and detours, which can lead to increased traffic congestion, thereby increasing motor vehicle exhaust emissions on nearby roadways, which could result in elevated localized pollutant levels (or concentrations). However, compared with emissions from other motor vehicle sources in the GO Station study areas, emissions from construction equipment and machinery are generally insignificant with respect to compliance with provincial and federal ambient AAQC.

Operations and Maintenance – All GO Stations

During the operations and maintenance phase of the GO Stations, the major source of air emissions is generated by the combustion engines from buses in the bus loops and passenger vehicles in the PPUDO area and parking lots (where applicable). Fugitive dust emissions may also be generated from vehicles travelling to/from the GO Stations on nearby paved surfaces such as adjacent municipal roadways and on-site driveways.

The potential effect on local air quality during the operations and maintenance phase is predicted to be negligible for most of the contaminants. All sensitive and critical receptors located along the Barrie rail corridor have predicted concentrations that are lower than the applicable limit values with the exception of Benzene (Kirby GO Station) and B(a)P (all GO Stations). It is noted that the background levels for Benzene (Kirby GO Station) and B(a)P (all GO Stations) are already high in the GO Station study areas, and these contaminants could have an effect on air quality in the area. Continuous exposure to these contaminants can potentially cause human health effects; however, exposure to B(a)P and Benzene at normal background levels is unlikely to have any adverse effect on human health.

4.3.6.2 Mitigation Measures

Construction – All GO Stations

Best Management Practices (BMPs) will be implemented to mitigate potential air quality effects associated with the construction activities, which will be included in an Air Quality Management Plan. This plan will be implemented for the duration of the construction phase, and will address the areas of vehicle and construction equipment exhaust, potential traffic disruption and congestion, fugitive dust, and odour. Potential mitigation measures for these areas are:

- Implementation of dust suppression measures (i.e., application of water wherever appropriate, or the use of approved non-chloride chemical dust suppressants, where the application of water is not suitable) as needed to control fugitive dust emissions in accordance with the publication "Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities" (Cheminfo Services Inc., 2005);
- Stockpiling of soil and other friable materials in locations that are less exposed to wind (i.e., protected from the wind by suitable barriers or wind fences/screens) and far from sensitive receptors;
- Seeding, paving, covering, wetting, or otherwise treating disturbed soil surfaces as soon as reasonably possible after disturbance. Permanently stabilizing exposed soil areas with non-erodible material (i.e., stone or vegetation) as soon as reasonably possible after construction in the affected area is complete;
- Modifying work schedules when weather conditions could lead to adverse impacts (i.e., very dry soil and high winds);
- Removing all loose or unsecured debris or materials from empty trucks prior to leaving the GO Station sites;
- Covering all truckloads of dust-producing material, including use of dump trucks with retractable covers for the transport of soils and other friable materials;
- Minimizing the number of loadings and unloading of friable materials;
- Minimizing drop heights, using enclosed chutes, and covering debris bins used for deconstruction of affected structures;
- Reducing unnecessary traffic and implementation of speed limits on any unpaved surfaces;
- Vacuum sweeping or watering of all paved surfaces and roadways on which equipment and truck traffic enter and leave the construction areas;
- Washing of equipment and machinery, and use of wheel washes or mud mats where practical at construction site exits to limit the migration of soil and dust off-site;
- Ensuring that all construction vehicles, machinery, and equipment is equipped with current emission controls, which are in a state of good repair, that equipment is properly and regularly maintained, and compliant with applicable federal and provincial regulations for off-road diesel engines; and

- Site supervisors during the construction phase should monitor the site for wind direction and weather conditions to ensure that high-impact activities be reduced when the wind is blowing consistently towards nearby sensitive receptors. The site supervisor should also monitor for visible fugitive dust and take action to determine the root-cause in order to counteract this. Specific details to this effect should be included in the construction site's Dust Management Plan (DMP).

Operations and Maintenance – All GO Stations

Operations and maintenance of the GO Stations will be carried out in accordance with applicable regulations and standards, including Ontario's AAQC (PIBS#6570e01) (MOE, 2016). To improve general air quality around the GO Stations during the operations and maintenance phase, the following measures are recommended but not limited to:

- Erecting signs that encourage people to turn off their vehicles instead of idling for long periods of time;
- Implementing MUP connections to increase the number of passengers that are walking or cycling to access the GO Stations; and
- Designating parking spots that are only available for carpoolers, for stations with parking lots.

Dust emissions from the roads will be minimized by cleaning the roadways and parking lots.

4.3.6.3 Monitoring Activities

Construction – All GO Stations

Construction activities will be monitored by a qualified Environmental Inspector who will frequently review the effectiveness of the mitigation measures and construction BMPs to confirm that they are functioning as intended. In the event that mitigation measures and/or construction BMPs are not functioning as intended (or are ineffective), revised mitigation measures/BMPs designed to improve their overall effectiveness will be implemented. Dust levels will be monitored to assess the effectiveness of dust suppression measures and will be adjusted if required. Monitoring will continue throughout the construction phase until activities are complete, all exposed soils have been stabilized, and all construction waste has been cleaned up. A complaint response protocol for nuisance effects, such as dust, will also be established.

Operations and Maintenance – All GO Stations

Metrolinx maintains ongoing inspection schedules to monitor the effectiveness of its GO Transit operations. A complaints procedure is in place to address any concerns raised by neighboring land owners, municipalities or the public.

4.3.7 Noise

4.3.7.1 Potential Effects

Construction – All GO Stations

Construction activities associated with the GO Stations that are likely to cause potential noise

effects generally include:

- Soil excavation, grading, compaction;
- Vehicle movements, heavy lifting; and
- Existing track modifications and demolition.

The above potential effects are generally limited to the lands adjacent to the GO Stations and may be perceived as a short-term nuisance to affected building occupants, including nearby residents.

Stationary Noise – All GO Stations

Causes of potential noise effects can include GO Station public address systems and ancillary systems.

Operations and Maintenance – All GO Stations

Operations and maintenance activities associated with the GO Stations that are likely to cause potential noise effects generally include:

- Increased vehicle movements for station bus loops, PPUDO and parking (for stations with parking lots);
- Idling buses at the station (for stations with bus laybys);
- Station roof HVAC units;
- Emergency generators;
- Speed variation of rolling stock; and
- Incoming train bells/station bells and whistles.

The adjusted noise impacts between the Future Build and Future No Build cases, at all sensitive receptors, are below five dB as shown in Table 4-13.

Table 4-13: Point of Reception Noise Summary

Receptor		Distance to Track (metres)	Current Conditions (dBA)	Future 1 (No-Build) (dBA)	Future 2 (Build) (dBA)	Adjusted Noise Impact (dB)
Spadina-Front GO Station						
R1	Day	28	68	76	76	0
	Night	28	60	70	70	0
R2	Day	52	64	73	73	0
	Night	52	57	67	67	0
R3	Day	61	63	71	71	0
	Night	61	56	66	66	0
R4	Day	72	60	69	69	0
	Night	72	54	63	64	1
R5	Day	81	60	68	68	0
	Night	81	53	63	64	1

Receptor		Distance to Track (metres)	Current Conditions (dBA)	Future 1 (No-Build) (dBA)	Future 2 (Build) (dBA)	Adjusted Noise Impact (dB)
R6	Day	89	59	67	68	1
	Night	89	52	62	63	1
R7	Day	91	59	67	68	1
	Night	91	52	62	63	1
R8	Day	51	63	71	71	0
	Night	51	56	66	66	0
R9	Day	32	66	74	74	0
	Night	32	60	69	69	0
R10	Day	39	61	70	70	0
	Night	39	55	65	65	0
R11	Day	49	54	63	63	0
	Night	49	48	57	57	0
R12	Day	68	58	66	67	1
	Night	68	51	61	62	1
R13	Day	76	57	66	66	0
	Night	76	51	61	61	0
R14	Day	54	57	65	66	1
	Night	54	50	60	61	1
R15	Day	55	51	60	60	0
	Night	55	45	54	55	1
R16	Day	55	53	62	62	0
	Night	55	47	56	57	1
R17	Day	52	54	63	63	0
	Night	52	48	57	57	0
R18	Day	50	56	64	64	0
	Night	50	49	58	59	1
R19	Day	58	60	68	68	0
	Night	58	53	62	63	1
R20	Day	57	63	71	72	1
	Night	57	56	66	66	1
Bloor-Lansdowne GO Station						
R1	Day	32	49	55	55	0
	Night	32	44	52	52	0
R2	Day	46	47	50	50	0
	Night	46	44	50	50	0
R3	Day	68	52	53	53	0
	Night	68	45	49	49	0
R4	Day	28	56	58	56	-2
	Night	28	50	60	57	-3
R5	Day	41	57	59	58	-1
	Night	41	51	59	56	-3
R6	Day	64	54	56	54	-2
	Night	64	48	53	50	-3
R7	Day	68	54	55	54	-1

Receptor		Distance to Track (metres)	Current Conditions (dBA)	Future 1 (No-Build) (dBA)	Future 2 (Build) (dBA)	Adjusted Noise Impact (dB)
	Night	68	48	53	50	-3
R8	Day	61	58	59	58	-1
	Night	61	50	53	51	-2
R9	Day	31	51	55	53	-2
	Night	31	50	54	51	-3
R10	Day	32	56	57	55	-2
	Night	32	51	55	52	-3
R11	Day	181	55	55	55	0
	Night	181	46	47	47	0
R12	Day	314	49	50	50	0
	Night	314	43	45	45	0
R13	Day	90	50	51	51	0
	Night	90	43	47	47	0
R14	Day	114	60	61	61	0
	Night	114	50	54	53	-1
R15	Day	11	63	71	68	-3
	Night	11	56	67	64	-3
R16	Day	63	59	61	60	-1
	Night	63	48	52	51	-1
R17	Day	65	60	60	60	0
	Night	65	47	50	49	-1
R18	Day	65	57	58	57	-1
	Night	65	47	51	49	-2
R19	Day	110	58	58	58	0
	Night	110	49	50	50	0
R20	Day	109	58	59	59	0
	Night	109	49	51	50	-1
R21	Day	8	65	72	71	-1
	Night	8	57	68	67	-1
R22	Day	206	65	66	66	0
	Night	206	56	57	57	0
R23	Day	206	67	68	68	0
	Night	206	58	58	58	0
R24	Day	204	67	68	68	0
	Night	204	58	58	58	0
R25	Day	204	67	68	68	0
	Night	204	58	58	58	0
R26	Day	204	68	69	69	0
	Night	204	58	59	59	0
R27	Day	101	55	58	57	-1
	Night	101	48	53	53	0
R28	Day	157	69	70	70	0
	Night	157	59	60	60	0

Receptor		Distance to Track (metres)	Current Conditions (dBA)	Future 1 (No-Build) (dBA)	Future 2 (Build) (dBA)	Adjusted Noise Impact (dB)
R29	Day	151	68	69	69	0
	Night	151	59	59	59	0
R30	Day	135	65	65	65	0
	Night	135	56	57	57	0
R31	Day	119	63	63	63	0
	Night	119	55	56	56	0
R132	Day	88	59	60	60	0
	Night	88	53	54	54	0
R33	Day	67	58	59	59	0
	Night	67	52	54	54	0
R34	Day	53	59	60	60	0
	Night	53	52	56	56	0
R35	Day	123	54	55	55	0
	Night	123	51	52	52	0
R36	Day	122	55	57	56	-1
	Night	122	54	56	56	0
R37	Day	116	54	56	56	0
	Night	116	53	55	55	0
R38	Day	107	54	55	55	0
	Night	107	50	52	52	0
R39	Day	97	55	56	56	0
	Night	97	50	53	52	-1
R40	Day	89	56	56	56	0
	Night	89	51	54	54	0
R41	Day	79	59	59	59	0
	Night	79	52	55	55	0
R42	Day	87	59	59	59	0
	Night	87	51	54	54	0
R43	Day	84	56	56	56	0
	Night	84	49	52	52	0
R44	Day	77	59	59	59	0
	Night	77	52	54	53	-1
R45	Day	68	59	59	59	0
	Night	68	51	53	53	0
R46	Day	322	48	49	49	0
	Night	322	45	46	46	0
R47	Day	305	46	47	47	0
	Night	305	46	47	47	0
R48	Day	285	48	49	49	0
	Night	285	47	49	48	-1
R49	Day	277	48	50	49	-1
	Night	277	47	49	49	0
R50	Day	258	48	49	49	0

Receptor		Distance to Track (metres)	Current Conditions (dBA)	Future 1 (No-Build) (dBA)	Future 2 (Build) (dBA)	Adjusted Noise Impact (dB)
	Night	258	48	49	49	0
R51	Day	249	50	51	51	0
	Night	249	49	51	50	-1
R52	Day	234	69	69	69	0
	Night	234	59	59	59	0
R53	Day	285	69	70	70	0
	Night	285	60	60	60	0
R54	Day	278	68	69	69	0
	Night	278	60	60	60	0
R55	Day	268	58	58	58	0
	Night	268	53	59	59	0
R56	Day	31	59	58	58	0
	Night	31	56	57	57	0
Kirby GO Station						
R1	Day	285	60	61	62	1
	Night	285	54	56	56	0
R2	Day	381	68	69	69	0
	Night	381	62	63	63	0
R3	Day	391	68	69	69	0
	Night	391	62	63	63	0
R4	Day	393	68	69	69	0
	Night	393	62	63	63	0
R5[1]	Day	313	53	55	55	0
	Night	313	52	54	54	0
R6	Day	380	66	67	67	0
	Night	380	60	61	61	0
R7	Day	459	59	60	60	0
	Night	459	52	54	54	0
R8	Day	348	69	70	70	0
	Night	348	63	64	64	0
R9[2]	Day	365	59	60	60	0
	Night	365	56	57	57	0
R10	Day	359	61	62	62	0
	Night	359	57	58	59	1
R11[3]	Day	307	58	60	61	1
	Night	307	50	53	53	0
R12	Day	328	65	66	66	0
	Night	328	59	60	60	0
Mulock GO Station						
R1	Day	111	57	57	57	0
	Night	111	53	49	49	0
R2	Day	185	58	59	59	0
	Night	185	52	50	50	0

Receptor		Distance to Track (metres)	Current Conditions (dBA)	Future 1 (No-Build) (dBA)	Future 2 (Build) (dBA)	Adjusted Noise Impact (dB)
R3	Day	294	64	65	65	0
	Night	294	56	56	56	0
R4	Day	317	62	63	63	0
	Night	317	55	54	54	0
R5[4]	Day	397	65	66	66	0
	Night	397	57	58	58	0
R6	Day	505	66	67	67	0
	Night	505	57	58	58	0
R7	Day	532	66	67	67	0
	Night	532	57	58	58	0
R8	Day	556	67	68	68	0
	Night	556	59	60	60	0
R9	Day	357	54	55	55	0
	Night	357	47	47	47	0
R10	Day	375	54	55	55	0
	Night	375	47	46	46	0
R11	Day	395	54	55	55	0
	Night	395	47	46	46	0
R12	Day	279	55	56	56	0
	Night	279	47	47	47	0
R13	Day	167	53	53	52	-1
	Night	167	46	47	47	0
Innisfil GO Station						
R1	Day	280	56	68	68	0
	Night	280	47	59	59	0
R2[5]	Day	190	51	62	62	0
	Night	190	44	53	52	-1
R3	Day	58	53	58	56	-2
	Night	58	50	54	51	-3
R4	Day	57	54	58	56	-2
	Night	57	50	54	51	-3
R5	Day	57	53	57	55	-2
	Night	57	50	54	51	-3
R6	Day	57	54	57	55	-2
	Night	57	50	54	50	-4
R7	Day	58	54	56	54	-2
	Night	58	51	54	51	-3
R8	Day	62	53	56	53	-3
	Night	62	51	54	51	-3

[1]R5 corresponds to SR035 in the EPR dated August 2017. (RWDI, 2017)
[2]R9 corresponds to SR036 in the EPR dated August 2017. (RWDI, 2017)
[3]R11 corresponds to SR037 in the EPR dated August 2017. (RWDI, 2017)
[4]R5 corresponds to SR074 in the EPR dated August 2017. (RWDI, 2017)
[5]R2 corresponds to SR132 in the EPR dated August 2017. (RWDI, 2017)

4.3.7.2 Mitigation Measures

Construction

Construction BMPs will be utilized to minimize any adverse effects from construction noise at nearby sensitive receptors. Prior to construction, a Noise and Vibration Control Plan shall be developed and implemented to reduce the noise impacts at sensitive receptors. According to municipal by-laws, construction activities carried out under the direction of Provincial Agencies such as Metrolinx are not restricted to the Noise By-law hours as noted below:

- Spadina-Front and Bloor-Lansdowne GO Stations: According to clause 2.1C of City of Toronto Municipal Code Chapter 591, construction work for "major transit projects" is not restricted to the Noise By-law hours;
- Kirby GO Station: According to the City of Vaughan By-Law 96-2006 construction activities carried out under the direction of Provincial Agencies such as Metrolinx are not restricted to the Noise By-law hours;
- Mulock GO Station: According to the Town of Newmarket Noise By-law No. 2004-94 activities carried out under the direction of Provincial Agencies such as Metrolinx are not restricted to the Noise By-law hours; and
- Innisfil GO Station: According to the Town of Innisfil Noise By-law No. 122-16 Commercial Construction activities carried out under the direction of Provincial Agencies such as Metrolinx are not restricted to the Noise By-law hours.

However, Metrolinx has committed to take the following noise mitigation measures:

- Whenever possible, road construction activities will occur during the day instead of at night;
- If construction needs to be undertaken outside of the normal daytime hours, local residents and municipalities will be informed beforehand of the type of construction planned and the expected duration;
- Construction equipment will meet the noise level specifications in MOECC guidelines NPC-115 and NPC-118;
- Noise control measures will be implemented, i.e.:
  - Implement noise compliance checks to ensure equipment levels are in compliance with MOECC guidelines NPC-115 and NPC-118;
  - Keep equipment well-maintained and fitted with efficient muffling devices;
  - Restrict idling of equipment to the minimum necessary to perform the specified work;
  - Avoid unnecessary revving of engines and switch off equipment when not required (do not idle);
  - Coordinate 'noisy' operations such that they will not occur simultaneously, where possible;
  - Use rubber linings in chutes and dumpers to reduce impact noise, where possible;

- Minimize drop heights of materials; and
- Route haulage/dump trucks on main road where possible, rather than quieter residential roads.

In addition to the above measures, Metrolinx will implement a communications protocol to provide advance notification of construction works to affected persons to inform them of the timing and duration of construction activities including anticipated noise effects.

Note that MOL requirements and Ontario's OHSA and Regulations (Reg. 213/91-105) (Government of Ontario, 2018) specify obligations for dump trucks to be equipped with automatic audible reversal alarms when operated in reverse.

During construction work if it is determined that there is a need to further reduce noise effects, additional mitigation measures may be considered and implemented, where appropriate.

Stationary Noise – All GO Stations

During detailed design, the station public address system, ancillary systems, and any other stationary noise sources shall be designed so that the one-hour equivalent sound level does not exceed the higher of the applicable exclusion limit value given in NPC-300, or the background sound level.

Operations and Maintenance – All GO Stations

Noise mitigation measures are not deemed to be necessary during the operations and maintenance phase.

4.3.7.3 Monitoring Activities

Construction – All GO Stations

Construction activities will be monitored by a qualified Environmental Inspector who will frequently check the effectiveness of the mitigation measures and the execution of construction BMPs. Should the Environmental Inspector confirm the prescribed mitigation measures and/or BMPs are not functioning as planned, revised mitigation measures and/or BMPs designed to improve effectiveness will be implemented. The revised measures shall be reinstated as required in a timely manner.

A complaints protocol will be prepared and implemented for receiving, investigating and addressing construction noise complaints from the public during construction of the Mulock GO Station. The protocol will include a plan for how the public is to be notified of their options for lodging a complaint.

Monitoring equipment will be installed, as required, to measure and document noise levels at various points to provide empirical data for the assessment of complaints.

Stationary Noise – All GO Stations

A complaints procedure is in place to address any concerns raised by neighbouring land owners, the municipalities, or the public.

Operations and Maintenance – All GO Stations

Metrolinx and GO Transit have ongoing inspection programs to monitor and upkeep its equipment and infrastructure. Maintaining good working order of its property is anticipated to reduce incidents of community exposure to excessive noise emissions. A complaints procedure is in place to address any concerns raised by neighbouring land owners, the affected municipalities, or the public.

4.3.8 Vibration

4.3.8.1 Potential Effects

With implementation of the proposed GO Stations, trains in the vicinity of the GO Stations would be traveling at slower speeds as they accelerate/decelerate when leaving/approaching the GO Stations. Typically, lower train speeds correlate to lower vibration levels. Therefore, the introduction of the GO Stations is unlikely to exacerbate baseline vibration levels. A review of all study areas did not identify any commercial, institutional, or industrial land uses for which the Project related potential change in vibration levels could have an impact.

Construction – All GO Stations

Construction activities associated with the GO Stations likely to cause potential vibration effects generally include:

- Soil excavation, grading, compaction;
- Vehicle movements, heavy lifting; and
- Existing track modifications and demolition

The above potential effects are generally limited to the lands adjacent to the GO Stations and may be perceived as a short-term nuisance to affected building occupants, including nearby residents.

Operations and Maintenance – All GO Stations

Operations and maintenance activities associated with the GO Stations are likely to cause potential vibration effects. Specifically, significant vibration sources include:

- Spadina-Front GO Station: Diesel operated bidirectional passenger rail services along the Lakeshore West, Milton, Kitchener and Barrie rail corridors; freight trains; and automobile traffic along adjacent local streets;
- Bloor-Lansdowne GO Station: Diesel operated passenger rail service along the Barrie rail corridor; diesel operated passenger rail service along the Kitchener rail corridor; diesel operated service along the Milton rail corridor; traffic volumes along Bloor Street West, Dundas Street West, Lansdowne Avenue and Symington Avenue;
- Kirby GO Station: Diesel operated rail services along the Barrie rail corridor; traffic volumes along Keele Street and Kirby Road; and crossovers and switches;
- Mulock GO Station: Diesel operated rail services along the Barrie rail corridor; traffic volumes along Mulock Drive and Bayview Avenue; and crossovers and switches; and

- Innisfil GO Station: Diesel operated rail services along the Barrie rail corridor; ongoing construction associated with the new Sleeping Lion residential development located east of the GO Station; and crossovers and switches.

Overall vibration levels remain below 0.14 mm/sec RMS or changes to vibration levels remain below 25 percent where the pre-Project vibration level is greater than 0.14 mm/sec. This is shown in Table 4-14.

Table 4-14: Vibration Receptor Summary

Receptor	Existing Velocity RMS (mm/s)	Future 1 (No Build) Velocity RMS (mm/s)	Future 2 (Build) Velocity RMS (mm/s)	Increase in Vibration Levels due to Project
Spadina-Front GO Station				
R1	0.07	0.07	0.11	0.04
R2	0.04	0.04	0.06	0.02
R3	0.03	0.03	0.05	0.02
R4	0.02	0.02	0.04	0.02
R5	0.02	0.02	0.03	0.01
R6	0.03	0.03	0.02	-0.01
R7	0.03	0.03	0.02	-0.01
R8	0.06	0.06	0.04	-0.02
R9	0.10	0.10	0.06	-0.04
R10	0.08	0.08	0.05	-0.03
R11	0.06	0.06	0.03	-0.03
R12	0.03	0.03	0.04	0.01
R13	0.03	0.03	0.04	0.01
R14	0.04	0.04	0.06	0.02
R15	0.04	0.04	0.06	0.02
R16	0.04	0.04	0.06	0.02
R17	0.06	0.06	0.08	0.02
R18	0.06	0.06	0.08	0.02
R19	0.05	0.05	0.07	0.02
R20	0.05	0.05	0.07	0.02
Bloor-Lansdowne GO Station				
R1	0.05	0.05	0.05	-0.00
R2	0.03	0.04	0.04	-0.00
R3	0.02	0.03	0.03	-0.00
R4	0.05	0.06	0.03	-0.03
R5	0.04	0.04	0.02	-0.02
R6	0.03	0.03	0.02	-0.01
R7	0.02	0.03	0.02	-0.01

Receptor	Existing Velocity RMS (mm/s)	Future 1 (No Build) Velocity RMS (mm/s)	Future 2 (Build) Velocity RMS (mm/s)	Increase in Vibration Levels due to Project
R8	0.03	0.03	0.02	-0.01
R9	0.05	0.06	0.03	-0.03
R10	0.05	0.05	0.03	-0.02
R11	0.01	0.01	0.01	-0.00
R12	0.01	0.01	0.01	0.00
R13	0.02	0.02	0.04	0.02
R14	0.02	0.02	0.01	-0.01
R15	0.11	0.13	0.07	-0.06
R16	0.03	0.03	0.03	0.00
R17	0.03	0.03	0.03	0.00
R18	0.03	0.03	0.09	0.06
R19	0.02	0.02	0.02	0.00
R20	0.02	0.02	0.02	0.00
R21	0.16	0.19	0.19	0.00
R22	0.01	0.01	0.01	0.00
R23	0.01	0.01	0.01	0.00
R24	0.01	0.01	0.01	0.00
R25	0.01	0.01	0.01	0.00
R26	0.01	0.01	0.01	0.00
R27	0.02	0.02	0.02	0.00
R28	0.01	0.01	0.01	0.00
R29	0.01	0.01	0.01	0.00
R30	0.01	0.02	0.02	0.00
R31	0.01	0.02	0.02	0.00
R32	0.02	0.02	0.02	0.00
R33	0.02	0.03	0.03	0.00
R34	0.03	0.03	0.03	0.00
R35	0.01	0.02	0.01	0.00
R36	0.01	0.02	0.01	0.00
R37	0.02	0.02	0.02	0.00
R38	0.02	0.02	0.02	0.00
R39	0.02	0.02	0.02	0.00
R40	0.02	0.02	0.02	0.00
R41	0.02	0.02	0.02	0.00
R42	0.02	0.02	0.02	0.00

Receptor	Existing Velocity RMS (mm/s)	Future 1 (No Build) Velocity RMS (mm/s)	Future 2 (Build) Velocity RMS (mm/s)	Increase in Vibration Levels due to Project
R43	0.02	0.02	0.02	0.00
R44	0.02	0.02	0.02	0.00
R45	0.02	0.03	0.02	0.00
R46	0.01	0.01	0.01	0.00
R47	0.01	0.01	0.01	0.00
R48	0.01	0.01	0.01	0.00
R49	0.01	0.01	0.01	0.00
R50	0.01	0.01	0.01	0.00
R51	0.01	0.01	0.01	0.00
R52	0.01	0.01	0.01	0.00
R53	0.01	0.01	0.01	0.00
R54	0.01	0.01	0.01	0.00
R55	0.01	0.01	0.01	0.00
R56	0.05	0.05	0.05	0.00
Kirby GO Station				
R1	0.02	0.03	0.03	0.00
R2	0.02	0.02	0.02	0.00
R3	0.01	0.02	0.02	0.00
R4	0.01	0.02	0.02	0.00
R5[1]	0.02	0.03	0.03	0.00
R6	0.05	0.07	0.07	0.00
R7	0.04	0.06	0.04	-0.02
R8	0.02	0.02	0.01	-0.01
R9[2]	0.05	0.07	0.01	-0.05
R10	0.05	0.07	0.01	-0.06
R11[3]	0.06	0.08	0.02	-0.07
Mulock GO Station				
R1	0.05	0.07	0.01	-0.05
R2	0.03	0.04	0.01	-0.03
R3	0.02	0.02	0.01	-0.02
R4	0.02	0.02	0.02	+0.00
R5[4]	0.01	0.02	0.01	-0.01
R6	0.01	0.02	0.02	0.00
R7	0.03	0.05	0.05	0.00
R8	0.01	0.01	0.01	0.00

Receptor	Existing Velocity RMS (mm/s)	Future 1 (No Build) Velocity RMS (mm/s)	Future 2 (Build) Velocity RMS (mm/s)	Increase in Vibration Levels due to Project
R9	0.02	0.02	0.02	0.00
R10	0.02	0.02	0.02	0.00
R11	0.01	0.02	0.02	0.00
R12	0.02	0.03	0.04	0.01
R13	0.03	0.05	0.02	-0.03
R14	0.05	0.07	0.01	-0.05
R15	0.03	0.04	0.01	-0.03
R16	0.02	0.02	0.01	-0.02
R17	0.02	0.02	0.01	-0.02
R18	0.01	0.02	0.01	-0.01
R19	0.01	0.02	0.02	0.00
R20	0.03	0.05	0.05	0.00
R21	0.01	0.01	0.01	0.00
Innisfil GO Station				
R1	0.02	0.02	0.01	-0.01
R2[5]	0.02	0.02	0.05	0.03
R3	0.08	0.08	0.04	-0.05
R4	0.08	0.08	0.04	-0.05
R5	0.08	0.08	0.04	-0.05
R6	0.08	0.08	0.05	-0.04
R7	0.08	0.08	0.05	-0.03
R8	0.08	0.08	0.08	-0.03

[1]*R5 corresponds to SR035 in the EPR dated August 2017 (RWDI, 2017).*
[2]*R9 corresponds to SR036 in the EPR dated August 2017 (RWDI, 2017).*
[3]*R11 corresponds to SR037 in the EPR dated August 2017 (RWDI, 2017).*
[4]*R5 corresponds to SR074 in the EPR dated August 2017. (RWDI, 2017)*
[5]*R2 corresponds to SR132 in the EPR dated August 2017. (RWDI, 2017)*

4.3.8.2 Mitigation Measures

Construction – All GO Stations

Construction BMPs will be utilized to minimize any adverse effects from construction vibration at nearby sensitive receptors. Prior to construction, a Noise and Vibration Control Plan shall be developed and implemented to reduce the vibrations impacts at sensitive receptors. The plan will include the following details for vibration:

- Whenever possible, road construction activities will occur during the day instead of at night;

- If construction needs to be undertaken outside of the normal daytime hours, local residents and municipalities will be informed beforehand of the type of construction planned and the expected duration;
- Vibration control measures are being implemented, e.g.:
  - Use of construction methods which may minimize vibration, where possible; and
  - Use of lower vibration-generating equipment where practical.

In addition to the above measures, Metrolinx will develop a monitoring/verification plan to demonstrate that the mitigation measures above are appropriate, functioning correctly, and that acceptable vibration levels at sensitive receivers are maintained for the duration of construction.

Blasting operations are generally prohibited. If blasting is unavoidable the Contractor must obtain approval from the pertinent municipality and undertake a detailed impact assessment and implement appropriate mitigation measures to ensure compliance with local by-laws and MOECC guidelines, including NPC-119 Blasting, as documented in the Model Municipal Noise Control By-law (Ontario Ministry of the Environment, 2008).

No specific construction vibration mitigation measures are anticipated to be required to address potential building damage, assuming there will be no impact or vibratory pile driving, and that vibratory rollers will be set back at least eight metres from existing structures and buildings.

During construction work if it is determined that there is a need to further reduce vibration effects, additional mitigation measures may be considered and implemented.

Operations and Maintenance – All GO Stations

Vibration mitigation measures are not deemed to be necessary during the operations and maintenance phase, as the objective was not exceeded by 25 percent at any receptor.

4.3.8.3 Monitoring Activities

Construction – All GO Stations

Construction activities will be monitored by a qualified Environmental Inspector who will frequently check the effectiveness of the mitigation measures and the execution of the Noise and Vibration Control Plan. Should the Environmental Inspector confirm the prescribed mitigation measures and/or BMPs in the plan are not functioning as planned, revised mitigation measures and/or BMPs designed to improve effectiveness of the plan will be implemented. The revised measures shall be reinstated as required in a timely manner.

Should the Contractor or Environmental Inspector notice or be made aware of property or infrastructure damage due to construction vibration, work in the area will stop immediately. At this time, a restoration plan will be developed in consultation with the property or infrastructure owner, and the work will be completed using alternative methods to prevent further damage.

Monitoring equipment will be installed, as required, to measure and document vibration levels at various points to provide empirical data for the assessment of complaints. Monitoring equipment shall be capable of alarming the contractor when prohibited limits are exceeded.

Operations and Maintenance – All GO Stations

Metrolinx and GO Transit have ongoing inspection programs to monitor and upkeep its equipment and infrastructure. Maintaining good working order of its property is anticipated to reduce incidents of community exposure to excessive vibration emissions. A complaints procedure is in place to address any concerns raised by neighbouring land owners, municipalities, or the public.

4.3.9 Traffic and Transportation Infrastructure

4.3.9.1 Potential Effects

As previously noted a Transportation Brief was completed in lieu of a full TTIA for the Spadina-Front GO Station and therefore the assessment of effects, mitigation measures and monitoring activities is less involved than that of the other GO Stations.

4.3.9.1.1 Traffic Assessment

A queing analysis was completed for the TTIAs for Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations. These are provided in Appendix I of Volume 3 through Volume 6 of this EPR Addendum.

- Spadina-Front GO Station – Road closure or reduced lanes during construction will temporarily impede traffic flow in the vicinity of the GO Station;
- Bloor-Lansdowne GO Station – Overall, the majority of turning movements in the Bloor-Lansdowne study area will not be impacted by either diverted traffic or site-generated traffic, as the existing lanes are anticipated to have the capacity to accommodate additional volumes of vehicles without significant additional delays, or will not experience additional demand as a result of construction or site-generated traffic:
  - Construction:
    - Delays at all intersections along the detour route resulting from additional detoured traffic volumes; and
    - Critical movements for some intersections along the detour route are expected to operate above capacity.
  - Operations and Maintenance:
    - Potential effects to traffic operations as a result of additional site-generated traffic may be experienced at some intersections in the opening year (2025) and the 5-year horizon (2030).
- Kirby GO Station – Overall, the operation of the majority of turning movements in the Kirby study area will not be impacted by either diverted traffic or site-generated traffic. The existing travel lanes in the Kirby study area are anticipated to have the capacity to accommodate additional volumes of vehicles without significant additional delays, or will not experience additional demand as a result of construction or site-generated traffic:
  - Construction:

- Construction vehicles along haul route of Teston Road and Keele Street is anticipated to be minimal relative to forecasted background traffic volumes; and
- If construction is undertaken during the nighttime, traffic operations at intersections along the detour route will not experience significant additional delay resulting from detoured traffic volumes from Kirby Road.

- Operations and Maintenance:
  - Potential effects to traffic operations caused by site-generated traffic may be incurred by additional site-generated traffic in the Kirby study area.

- Mulock GO Station – Overall, the majority of turning movements in the Mulock study area will not be impacted by either diverted traffic or site-generated traffic, as the existing lanes are anticipated to have the capacity to accommodate additional volumes of vehicles without significant additional delays, or will not experience additional demand as a result of construction or site-generated traffic:
  - Construction:
    - A haul route for construction vehicles is identified along Mulock Drive; however, construction vehicle volumes are minimal relative to anticipated background traffic volumes, and unlikely to create potential effects to traffic operations at intersections along the haul route; and potential effects to traffic operations at intersections along the detour route resulting from additional detoured traffic volumes.
  - Operations and Maintenance:
    - Potential effects to traffic operations caused by site-generated traffic may be incurred by additional site-generated traffic in the Mulock study area.
- Innisfil GO Station – Overall, the majority of turning movements in the Innisfil study area will not be impacted by site-generated traffic, as the existing lanes are anticipated to have the capacity to accommodate additional volumes of vehicles while maintaining operations with acceptable levels of delay, or will not experience additional demand because of site generated traffic:
  - Construction:
    - 6th Line is identified as the proposed haul route, but volumes of construction vehicles will be minimal relative to anticipated background traffic on the corridor, thus delays to traffic operations are not anticipated within the Innisfil study area; and
    - Vehicle traffic may be obstructed while work is being undertaken adjacent to or within the 6th Line right-of-way (ROW).
  - Operations and Maintenance:

- Potential effects to traffic operations caused by site-generated traffic may be incurred by additional site-generated traffic in the Innisfil study area.

4.3.9.1.2 Site Circulation Assessment (Operations Only)

- Spadina-Front GO Station – not applicable for a Transportation Brief;
- Bloor-Lansdowne GO Station:
  - Emergency service vehicles (i.e., Fire, Police, and Ambulance) will be able to utilize municipal roads to reach any part of the GO Station site – excluding the rail corridor and GO Station platforms;
  - There are no potential anticipated safety concerns with site circulation as there are multiple vehicle, pedestrian, and cyclist accesses to the Bloor-Lansdowne GO Station;
  - All vehicles entering the site will travel through the intersection of St Helens Avenue and Bloor Street West; and
  - There are no expected queuing issues in 2025 or 2030, as queue lengths can be accommodated by the storage capacity of the Accessible Drop-Off Spaces (ADOS) access.
- Kirby GO Station:
  - Emergency vehicles will be able to utilize an internal circulation route within the parking lot to reach any parts of the GO Station site – excluding the rail corridor and GO Station platforms;
  - As three accesses to the GO Station site are provided via Keele Street and Kirby Road vehicles will be able to exit Kirby GO Station even if one of these accesses is obstructed in case of an emergency; and
  - Queuing issues and delays may be expected at Kirby GO Station during the P.M. peak hour in 2030/2035, with queues of up to 90 metres.
- Mulock GO Station:
  - Emergency service vehicles (i.e., Fire, Police, and Ambulance) will be able to utilize an internal circulation route within the parking lot to reach any part of the GO Station site – excluding the rail corridor and GO Station platforms;
  - As multiple accesses to the GO Station site are provided via Steven Court and Carberry Street, vehicles will be able to exit Mulock GO Station even if one of these accesses is obstructed in case of an emergency;
  - Maintenance vehicles will be able to access the future SWS and the SWM facility south of the GO Station via a ramp from the parking lot that terminates in a hammerhead-type turn around;
  - There are potential issues with maintenance vehicles blocking or being blocked by traffic to and from the parking lot;

- All vehicles entering the site will travel through the intersection of Mulock Drive and Steven Court/Kent Drive, or the intersection of Bayview Avenue and Carberry Street. Passenger pick-up and drop-off (PPUDO) vehicles will enter the GO Station site via the northern access road from Steven Court;
- Vehicles heading towards the parking lot can use either of the northern and southern access roads from Steven Court; and
- There are no expected queuing issues in 2025 or 2030, as queueing is not expected to exceed 40 metres at either exit in the A.M. and P.M. peak hours.

- Innisfil GO Station:
  - All vehicles entering the site will travel through the signalized access on the south side of the GO Station;
  - Emergency service vehicles (i.e., Fire, Police, and Ambulance) will be able to utilize an internal circulation route within the parking lot to reach any part of the GO Station site – excluding the rail corridor and GO Station platforms. However, access to the northern parking lot is provided by a single access, which may pose potential issues if obstructed during an emergency;
  - Maintenance vehicles will be able to access the future SWM facility at the north end of the GO Station via the GO Station's internal road network;
  - There are potential issues with maintenance vehicles blocking or being blocked by traffic to and from the parking lot; and
  - Queuing at the main signalized access is not expected to exceed 65 metres in 2035 during the P.M. peak period, which can be accommodated without blocking the upstream parking lot access.

4.3.9.1.3 Parking Assessment (Operations Only)

- Spadina-Front GO Station – not applicable for a Transportation Brief;
- Bloor-Lansdowne GO Station:
  - The Bloor-Lansdowne GO Station will not provide any parking spaces in the opening year (2025);
  - It is not anticipated that users accessing Bloor-Lansdowne GO Station will require parking, given the urban nature of the GO Station. However, it is possible that some users may choose to use vehicles to access Bloor-Lansdowne GO Station despite the lack of on-site parking. This may lead to additional circulating vehicles looking for parking spaces within the GO Station property and surrounding neighbourhood streets, which may result in undesired on-street parking and potential issues for pedestrians and cyclists on the streets; and
  - Additional parking demand on streets in the immediate vicinity of the Bloor-Lansdowne GO Station may also be induced by drivers picking up or dropping off passengers in areas other than the designated ADOS area;

- Kirby GO Station:
  - The Kirby GO Station will provide 1,000 parking spaces. This is intended to relieve existing parking demand at King City GO Station and potential future parking demand at Maple GO Station;
  - Expected combined carpool vehicles and drive and park vehicles using the parking lot is approximately 1,100 spaces in the 2030 horizon year, based on Metrolinx's modal splits and ridership projections (Metrolinx, 2016c);
  - The proposed parking supply is sufficient to accommodate these vehicles and to also potentially relieve existing parking demand at nearby GO Stations along the Barrie rail corridor. However, parking demand may grow to 1,400 vehicles per day in 2035; and
  - Limited parking supply may lead to additional circulating vehicles looking for parking spaces within the GO Station property and surrounding neighbourhood streets, which may result in undesired on-street parking and potential issues for pedestrians and cyclists on the street. The inability to find a parking space may also cause drivers who would normally travel to the Kirby GO Station to choose to drive to other nearby GO Stations that have a parking supply surplus, thus increasing traffic congestion near other GO Stations outside the Kirby study area.
- Mulock GO Station:
  - The Mulock GO Station will provide 700 parking spaces in the opening year (2025). This will be sufficient for the number of passengers using the vehicle mode to access the GO Station. However, this allowance of parking spaces may be insufficient by 2030, when it is estimated that over 1,700 vehicle round trips requiring parking spaces may be made from the GO Station;
  - Limited parking supply may lead to additional circulating vehicles looking for parking spaces within the GO Station property and surrounding neighbourhood streets, which may result in undesired on-street parking and potential issues for pedestrians and cyclists on the street; and
  - The inability to find a parking space may also cause drivers who would normally travel to the Mulock GO Station to choose to drive to other nearby GO Stations that have a parking supply surplus, thus increasing traffic congestion near other GO Stations outside the Mulock study area.
- Innisfil GO Station:
  - The Innisfil GO Station will provide approximately 350 parking spaces in the opening year (2025), protecting for the provision of an additional 150 parking spaces under full build-out. In 2035, however, projected parking demand may exceed supply. This may lead to additional circulating vehicles looking for parking spaces within the GO Station property and surrounding neighbourhood streets, which may result in undesired on-street parking and potential issues for pedestrians and cyclists on the street; and

- The inability to find a parking space may also cause drivers who would normally travel to the Innisfil GO Station to choose to drive to other nearby GO Stations if a parking supply surplus is present at those GO Stations, thus increasing traffic congestion and delay at other GO Stations outside the Innisfil study area.

4.3.9.1.4 Pedestrian and Cycling Access

- Spadina-Front GO Station - Increased pedestrian flow along sidewalk adjacent to the GO Station and at key intersections;
- Bloor-Lansdowne GO Station:
  - Construction:
    - Pedestrians and cyclists will be impacted by the partial closure of Bloor Street West and the full closure of Davenport Road during the Bloor-Lansdowne GO Station construction unless pedestrian and cyclist access across the work zones is provided;
    - If access through the work zone is not provided, the closest detour route available around a Bloor Street West closure would be via Wallace Avenue, 400 metres away; and
    - The closest detour route available for a Davenport Road closure would be via Dupont Avenue, 400 metres away. While such detours might be feasible for cyclists, they are lengthy alternatives for pedestrians and may be deemed infeasible.
  - Operations and Maintenance:
    - Once open, the Bloor-Lansdowne GO Station is expected to have a positive impact on pedestrians in the area;
    - The GO Station will be constructed with extensive pedestrian infrastructure that is expected to tie into the existing sidewalk network on Bloor Street West, St Helens Avenue, Merchant Lane, and the future Greenway on the east side of the Barrie rail corridor. This will encourage passengers to use active transportation modes when accessing the GO Station;
    - Dedicated bicycle infrastructure currently does not exist on Bloor Street West in the immediate vicinity of the Bloor-Lansdowne GO Station;
    - There are plans to connect the Bloor-Lansdowne GO Station to the future Greenway on the east side of the rail ROW, and the existing WTRP. However, there are no east-west corridors for cyclists immediately adjacent to the Bloor-Lansdowne GO Station;
    - There will be positive impacts on cyclist comfort and the cycling mode share through the implementation of the connections to other cycling infrastructure in the Bloor-Lansdowne study area;

- Based on the ridership (Metrolinx, 2016d) and mode split projections developed by Metrolinx, it is expected that there will be an additional 15 cycling trips and 168 walking trips generated by the GO Station by 2030 during the peak hour. The increase in the number of pedestrians may cause crowding at the waiting areas of some crosswalks, for example, at the intersection of Bloor Street West and St Helens Avenue, or at the intersection of Bloor Street West and Lansdowne Avenue;
- The pedestrian and cyclist trips are expected to have a minor effect on traffic operations in the Bloor-Lansdowne study area where potential conflicts may be observed for turning vehicles; and
- The pedestrian and cyclist bridge over Davenport Road will provide a direct active transportation connection between the Greenway and Earlscourt Park in the north of the Bloor-Lansdowne study area after its completion. This pedestrian and cyclist bridge may have an impact on the operations of adjacent traffic signals at the intersections of Davenport Road at Caledonia Park Road, and Davenport Road at Symington Avenue. The bridge may also have an impact on drivers' sightlines to adjacent traffic signals on Davenport Road.

- Kirby GO Station:
  - Construction:
    - During construction, Kirby GO Station is unlikely to impact pedestrian infrastructure in the Kirby study area, as there are currently no sidewalks on Kirby Road near the existing at-grade crossing of the Barrie rail corridor at Kirby Road; and
    - Cyclist activity may be negatively impacted, as cyclists on Kirby Road in the Kirby study area will now be required to detour to Teston Road or King Vaughan Road, both of which are two km away.
  - Operations and Maintenance:
    - After the opening of the Kirby GO Station, if connections between Kirby GO Station and existing active transportation infrastructure in the Kirby study area are made by the municipalities, Kirby GO Station has the potential to positively impact pedestrian and cyclist activity in the Kirby study area by providing the means for commuters to travel to Kirby GO Station by foot or by bicycle. However, further positive impacts on pedestrians and cyclist activity in the Kirby study area are minimal due to the lack of accessible destinations and infrastructure beyond the immediate vicinity of Kirby GO Station;
    - The preferred design for the GO Station proposes a connection between the future MUP along the TransCanada pipeline and the station which would support active transportation and transit interconnectivity to existing communities east of Keele Street and also provide access to the NMRP;

- Congestion and increased vehicle volumes in the Kirby study area following increased trips to and from Kirby GO Station may also negatively impact pedestrian and cyclist comfort;
- Based on the ridership (Metrolinx, 2016e) and mode split projections developed by Metrolinx, it is expected that there will be an additional 800 walking trips and 200 cycling trips generated per day by the GO Station by 2035, with 191 walking trips and 48 cycling trips occurring during the peak hour;
- Under existing conditions, the number of pedestrians observed at the intersection closest to the proposed Kirby GO Station (Keele Street and Kirby Road) is extremely low (under 5 crossing each leg in the peak hour); and
- The increase in the number of pedestrians may cause crowding at the waiting areas of some crosswalks, for example, at the intersection of Kirby Road and Keele Street. These pedestrian and cyclist trips are expected to have a minor effect on traffic operations in the Kirby study area, as cyclists potentially conflict with right-turning vehicles, and pedestrians crossing an intersection can conflict with left-turning and right-turning vehicles.

- Mulock GO Station:
  - Construction:
    - Pedestrians and cyclists will be impacted by the closure of Mulock Drive during Mulock GO Station construction unless pedestrian and cyclist access across the work zone is provided; and
    - If access through the work zone is not provided, the closest detour route available across the Barrie rail corridor will be on Water Street, which represents a detour of over one km. While such a detour might be feasible for cyclists, it is a lengthy alternative for pedestrians and may be deemed infeasible.
  - Operations and Maintenance:
    - Once open, the Mulock GO Station is expected to have a positive impact on pedestrians in the area;
    - The GO Station will be constructed with extensive pedestrian infrastructure that is expected to tie into the existing sidewalk network on Mulock Drive. This will encourage passengers to use active transportation modes when accessing the GO Station. However, pedestrian crossings at Mulock Drive west of the GO Station are limited as pedestrians will need to take the pedestrian underpass at the existing Tom Taylor/Nokiidaa Trail, or cross at Cane Parkway over 500 metres west of the Barrie rail corridor. Maintaining these facilities in the winter will also be a key requirement for providing access to the GO Station;
    - Congestion due to increased vehicle volumes in the Mulock study area following the opening of the Mulock GO Station, particularly at the intersections of Mulock

Drive at Steven Court and at Bayview Avenue, may negatively impact pedestrian and cyclist comfort due to additional conflict points;

- Dedicated bicycle infrastructure currently does not exist on Mulock Drive and there are no connections between the Mulock GO Station and the existing cycling infrastructure network. Positive impacts of the Mulock GO Station on either cyclist comfort or the cycling mode share are unlikely unless connections to the existing cycling infrastructure in the Mulock study area are provided;
- Based on the ridership (Metrolinx, 2016e) and mode split projections developed by Metrolinx, it is expected that there will be an additional 73 cycling trips and 219 walking trips generated by the GO Station by 2030, with 52 walking trips and 17 cycling trips occurring during the peak hour;
- Under existing conditions, the number of pedestrians observed at the intersection closest to the proposed Mulock GO Station – that is, Mulock Drive at Steven Court/Kent Drive, are extremely low with less than five crossing each leg in the peak hour. Cyclist levels at the intersection were very low, with none observed during peak hours during the collection of TMC;
- Some users who use local transit are also likely to cross the street while transferring between the westbound bus stop on the northeast corner of the intersection of Steven Court/Kent Drive and Mulock Drive and the Mulock GO Station, or to cross the intersection of Bayview Avenue and Carberry Street when transferring to northbound or southbound buses on Bayview Avenue; and
- The increase in the number of pedestrians may cause crowding at the waiting areas of some crosswalks, for example, at the intersection of Mulock Drive and Steven Court/Kent Drive, as well as Bayview Avenue and Carberry Street. The pedestrian and cyclist trips are expected to have a minor effect on traffic operations in the Mulock study area where potential conflicts may be observed for turning vehicles.

- Innisfil GO Station:
  - Construction:
    - As existing active transportation activity on 6th Line near the proposed Innisfil GO Station is low and there are no dedicated active transportation facilities expected on 6th Line by 2020, no potential effects to pedestrian or cyclist travel are anticipated during construction of the proposed Innisfil GO Station.
  - Operations and Maintenance:
    - Once open, the Innisfil GO Station is expected to have a positive impact on pedestrians in the area. The GO Station will be constructed with pedestrian infrastructure that is expected to tie into the future sidewalk and multi-use trail network at 6th Line. This will encourage passengers to use active transportation modes when accessing the GO Station;

- Congestion due to increased vehicle volumes in the Innisfil study area following the opening of the Innisfil GO Station, particularly at the vehicle accesses to Innisfil GO Station, may negatively impact pedestrian and cyclist comfort due to additional conflict points;
- There is a MUP on the north side of 6th Line from St. John's Road to east of the Barrie rail corridor crossing, however there are no connections between the Innisfil GO Station and the existing cycling infrastructure network;
- The 6th Line upgrades planned by the Town of Innisfil include a multi-use trail on the north side of the road. Positive impacts of the Innisfil GO Station on either cyclist comfort or the cycling mode share are unlikely unless connections to the planned cycling infrastructure in the Innisfil study area are provided by the Town;
- Based on the ridership (Metrolinx, 2016f) and mode split projections developed by Metrolinx, it is expected that there will be 82 cycling trips and 274 walking trips generated by the GO Station by 2035, with 66 walking trips and 20 cycling trips occurring during the peak hour; and
- Under existing conditions, the number of pedestrians observed at intersections on 6th Line is extremely low, with less than five at each leg in the peak hour. The increase in the number of pedestrians may cause crowding at the waiting areas of the crossing at the main signalized access to Innisfil GO Station. The pedestrian and cyclist trips are expected to have a minor effect on traffic operations in the Innisfil study area where potential conflicts may be observed for turning vehicles.

4.3.9.1.5 Transit Assessment

- Spadina-Front GO Station – not applicable for a Transportation Brief;
- Bloor-Lansdowne GO Station:
  - Construction:
    - The Bloor-Lansdowne GO Station may present short-term potential effects on local transit services for the duration of Bloor-Lansdowne GO Station construction;
    - The full closure of Davenport Road may require the TTC 127 Davenport bus route to be detoured. Detouring this route may remove service from bus stops on Davenport Road between Symington Avenue and Lansdowne Avenue. Detouring this route may also increase travel time on the route by two minutes under uncongested traffic conditions;
    - Additional delay at the intersections of Symington Avenue and Dupont Street and Lansdowne Avenue and Dupont Street along the detour route under construction conditions may further lengthen travel times on the route; and
    - The TTC 26 Dupont and 47 Lansdowne bus routes may also face delays from detoured traffic on Lansdowne Avenue, and Dupont Street for the duration of the road closures.

- Operations and Maintenance:
  - The construction of the Bloor-Lansdowne GO Station will provide a direct pedestrian link between regional transit at the GO Station and local transit at the Lansdowne TTC Station. This provides a potential solution to the last-mile problem[21] by enabling users to access their ultimate destinations via local transit after disembarking Bloor-Lansdowne GO Station, as the Lansdowne TTC Station provides connections to multiple transit routes;
  - It is expected that there will be up to 133 additional local transit trips in the 2030 horizon year during the A.M. and P.M. peak hours. Existing and future ridership, route capacity, and crowding issues on transit routes near Bloor-Lansdowne GO Station are unknown at this time, however, the additional local transit trips may create crowding issues on some routes if buses on the route are already at or near capacity; and

    Additional local transit trips may also cause additional crowding on the eastbound and westbound subway trains at Lansdowne TTC Station on the Bloor-Danforth Subway Line (Line 2).

- Kirby GO Station:
  - Construction:
    - If construction is undertaken during the nighttime, minimal delays are expected to the 22 King City bus route during construction as traffic operations will remain similar to that of background conditions; and
    - Transit users will experience minimal additional congestion due to additional vehicles on Keele Street detouring around the Kirby Road closure.
  - Operations and Maintenance:
    - After opening, Kirby GO Station may have a positive impact on transit users and transit service in the Kirby study area;
    - There is one existing bus route that could make a connection at Kirby GO Station: the YRT 22 King City bus. The connection to rapid transit at Kirby GO Station may increase ridership on this route, in turn potentially increasing the frequency of buses on these routes. The construction of Kirby GO Station is also supportive of the planned implementation of Frequent Transit Network corridors on Kirby Road and Keele Street between 2027 and 2031. These existing and planned transit routes provide potential opportunities to connect local bus transit routes with the RER trains at the Kirby GO Station;

[21] *The last mile problem describes the difficulty experienced by a user in travelling from a transportation hub to their final destination, especially in a context where local transit or active transit connections are limited.*

- If connections between local bus routes and Kirby GO Station are provided by YRT, there is potential for ridership on local bus routes to increase. Increases in local transit ridership provide opportunity and justification for local transit authorities to increase service on local bus routes. However, there is potential that bus routes in the Kirby study area will be delayed by additional traffic due to vehicles heading towards and away from Kirby GO Station;
- Transit routes may also be delayed while exiting Kirby GO Station by high conflicting traffic volumes. Furthermore, local riders' travel times may increase, as buses will need time to enter and exit Kirby GO station; and
- It is expected that there will be up to 255 additional local transit trips during the A.M. and P.M. peak hours in the 2035 horizon year. Existing and future ridership, route capacity, and crowding issues on the transit routes are not known. However, the additional local transit trips may create crowding issues on some routes of buses under future conditions.

- Mulock GO Station:
  - Construction:
    - The Mulock GO Station may present short-term potential effects on local transit services for the duration of Mulock GO Station construction; and
    - Closure of Mulock Drive to construct a second and third rail track at the existing at-grade rail crossing on the Barrie rail corridor at Mulock Drive will require the YRT 57 and 57A Mulock bus route to be detoured:
      - Detouring these routes will remove service from up to four bus stops on Mulock Drive between Yonge Street and Bayview Avenue; and
      - Detouring these routes will also increase travel time four minutes under uncongested traffic conditions. Congestion at the intersections of Yonge Street along the detour route may further lengthen travel times on the route.
    - The YRT 56 Gorham – Eagle bus route, which operates in an east west direction along Eagle Street between Yonge Street and Bayview Avenue may also encounter nighttime congestion from detoured traffic on Eagle Street at Water Street and Prospect Street.
  - Operations and Maintenance:
    - The additional site-generated traffic from passengers accessing the Mulock GO Station may create some congestion at intersections on Mulock Drive or Bayview Avenue, increasing travel time on the 54 Bayview and 57 Mulock transit routes;
    - Based on the ridership (Metrolinx, 2016e) and mode split projections developed by Metrolinx, it is expected that there will be an additional 255 local transit trips generated by the GO Station by 2030, with 61 additional local transit trips in the 2030 horizon year during the morning and afternoon peak hours; and

- Existing and future ridership, route capacity, and crowding issues on the transit routes are unknown at this time, however, the additional local transit trips may create crowding issues on some routes if buses on the route are already at or near capacity.

- Innisfil GO Station:
  - Construction:
    - Construction of the Innisfil GO Station is not likely to affect operation of microtransit services. However, as some construction of the Innisfil GO Station is expected to take place immediately adjacent to 6th Line, local transit stops on 6th Line present by 2020 may be obstructed or inaccessible during construction.
  - Operations and Maintenance:
    - After the opening of Innisfil GO Station, it is expected that there will be up to 85 microtransit trips in the 2035 horizon year generated by the Innisfil GO Station during the morning and afternoon peak hours. These additional site-generated trips may create a shortage of microtransit drivers, particularly during the A.M. and P.M. peak hours;
    - Demand for microtransit at the Innisfil GO Station may also create crowding in the PPUDO area during the P.M. peak hour if microtransit drivers arrive early in anticipation of riders disembarking the GO train and transferring to microtransit; and
    - When formalized local transit is developed for Innisfil, there are opportunities to connect local transit routes with the Innisfil GO Station. However, the additional local transit trips may cause crowding issues on future local transit routes.

4.3.9.2 Mitigation Measures

Recommendations such as the need for an additional road infrastructure or signal timing changes are under municipal control and cannot be adjusted by Metrolinx. Metrolinx will ensure that the recommendations contained in this EPR Addendum (Appendix I, Volume 2 through Volume 6) are shared with the applicable municipalities and transit authorities for their consideration in mitigating traffic impacts. The TTIAs provided in Appendix I, Volume 2 through Volume 6 of this EPR Addendum provide additional details and analysis into proposed mitigation measures for traffic and transportation effects of the Project on the Project study area.

4.3.9.2.1 Traffic Assessment

The TTIAs for the Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations have stated that a Construction Traffic Management Plan (CTMP) will be developed as a mitigation measure for the construction phase of the GO Stations, which will include:

- Provision of advance notice of construction to travellers and emergency service providers in the GO Station study areas prior to commencement of work;

- Variable message signs to provide additional route options for road users to minimize delays throughout the network; and
- Coordination with emergency service providers to identify potential safety issues associated with construction prior to commencement of work.

Individual GO Station mitigation measures were identified:

- Spadina-Front GO Station – Development of a traffic management plan to minimize traffic delays during construction;
- Bloor-Lansdowne GO Station:
  - Construction:
    - Signal timings that may help reduce delays at critical movements.
  - Operations and Maintenance:
    - Signal timing changes to reflect additional site-generated volumes will help improve intersection operations in the opening year and 5-year horizon (2030); and
    - Adjustment of signal timings that may help reduce delays at critical movements.
- Kirby GO Station:
  - Construction:
    - Only mitigation is above-mentioned CTMP.
  - Operations and Maintenance:
    - Adjustment of signal timing changes to accommodate additional traffic generated by the station, in order to reduce delays at some signalized intersections in the Kirby study area;
    - Geometric improvements at some intersections and streets already identified for improvement in the City of Vaughan and York Region TMPs; and
    - Signalization of the southern station access (Access 3) on Keele Street in 2030 will be helpful in reducing delays to vehicles exiting the station.
- Mulock GO Station:
  - Construction:
    - Adjustment of signal timings to better accommodate increased flow of traffic along the designated detour route during construction.
  - Operations and Maintenance:
    - Adjustment of signal timing changes to accommodate additional traffic generated by the station, in order to reduce delays at some signalized intersections in the Mulock study area.

- Innisfil GO Station:
  - Construction:
    - Undertaking work within the ROW in stages and shifting the alignment of the lanes slightly north or south to accommodate work on the south or north side of 6th Line, respectively can enable 6th Line to maintain one lane of travel in each direction.
  - Operations and Maintenance:
    - Adjustment of signal timing changes to accommodate additional traffic generated by the station, in order to reduce delays at some signalized intersections in the Innisfil study area; and
    - Conversion of some two-way stop controlled intersections to four-way stops to better serve altered traffic patterns and reduce delays after the opening of Innisfil GO Station.

4.3.9.2.2 Site Circulation Assessment (Operations Only)

- Spadina-Front GO Station – not applicable for a Transportation Brief;
- Bloor-Lansdowne GO Station – There are no effects from site circulation that are likely to require mitigation measures;
- Kirby GO Station:
  - Queuing within Kirby GO Station can be mitigated through the signalization of the southern access on Keele Street;
  - The proposed access is located roughly 200 m from the intersection of Keele Street and Peak Point Boulevard. This distance is less than the 215 m required for signalized intersections by the York Region Access Guideline (York Region, 2007);
  - However, good coordination with the signal at the intersection of Keele Street and Peak Point Boulevard would ensure minimal impacts to traffic flow on Keele Street; and
  - Installation of this signal would reduce expected queues at this access to no more than 80 metres in 2030.
- Mulock GO Station – Maintenance vehicles can avoid blocking or being blocked by traffic going in and out of the parking lot by limiting maintenance activities to outside the morning and afternoon peak periods; and
- Innisfil GO Station:
  - Maintenance vehicles can avoid blocking or being blocked by traffic going in and out of the parking lot by limiting maintenance activities to outside the morning and afternoon peak periods; and
  - Extending the southbound phase at the signalized access at Innisfil GO Station can be employed to reduce queues resulting from additional traffic exiting through the signalized access.

4.3.9.2.3 Parking Assessment (Operations Only)

The TTIAs for the GO Stations outside of Toronto (Kirby, Mulock and Innisfil GO Stations) have stated that Transportation Demand Management (TDM) strategies to encourage the use of carpooling, transit, and active modes may reduce the potential demand for parking spaces at the Kirby, Mulock and Innisfil GO Stations:

- This can be achieved by partnering with employers in the GTHA to offer carpooling financial incentives (i.e., through the Smart Commute program);
- Enhancement and extension of the existing bicycle and pedestrian facility network can also help to encourage the use of active transportation, particularly for users who live close to the Kirby, Mulock and Innisfil GO Stations;
- Alternately, enhancement of the existing local transit system service with integration with the Kirby, Mulock and Innisfil GO Stations may help to increase the transit mode share of passengers boarding trains at the Kirby, Mulock and Innisfil GO Stations; and
- Future TDM measures to be developed in consultation with Metrolinx and the municipalities.

Individual GO Station mitigation measures were identified:

- Spadina-Front GO Station – not applicable for a Transportation Brief;
- Bloor-Lansdowne GO Station:
  - Enhancement of existing parking enforcement strategies;
  - Enhancement of TDM strategies should the demand of parking supply exceed availability; and
  - Streets in the Bloor-Lansdowne study area may benefit from the increased enforcement of street parking policies to reduce illegal on-street parking and ensure that there are enough parking spaces for residents within the Bloor-Lansdowne study area who rely on on-street parking.
- Kirby GO Station:
  - If parking demand continues to increase beyond parking supply, then the construction of additional parking spaces at the Kirby GO Station may be considered. However, the construction of additional parking spaces may have negative environmental effects, and implicitly encourage users to drive to the Kirby GO Station rather than taking alternate modes of travel (i.e., bus, bicycle). Furthermore, construction of a parking lot will occupy prime land that could otherwise be developed into dense, transit-supportive developments.
- Mulock GO Station:
  - The TDM strategies were the only mitigation measures identified.
- Innisfil GO Station:

- The TDM strategies were the only mitigation measures identified.

4.3.9.2.4 Pedestrian and Cycling Assessment

The TTIAs for the Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations have stated that a CTMP will be developed as a mitigation measure for the construction phase of the GO Stations. This will include best practices for ensuring that pedestrian and cyclist access through the work zone is maintained in order to minimize lengthy detours, and that proper signage is implemented to alert pedestrians and cyclists of detours.

Individual GO Station mitigation measured are as follows:

- Spadina-Front GO Station
  - Construction – not applicable for a Transportation Brief.
  - Operations and Maintenance:
    - Provide a tunnel connection between the main GO Station access location and the north side of Front Street West just west of Spadina Avenue as part of the PATH/The Well development;
    - Implement a crosswalk on the south leg of the Front/Spadina intersection. Depending on traffic implications this crossing may be implemented in the form of an overpass or tunnel;
    - Signalization of the new pedestrian crosswalk at the west GO Station access location to accommodate pedestrians/ cyclists and ensure safety for all road users;
    - Widening of the west crosswalk at the intersection of Spadina Avenue and Front Street West;
    - Implementation of improved pedestrian crossing and pavement markings on the north crosswalk at the intersection of Front Street West and Draper Street; and
    - Extension of the improved sidewalk along the south side of Front Street West westerly to Bathurst Street.
- Bloor-Lansdowne GO Station:
  - Construction:
    - Development of above-mentioned CTMP; and
    - Access through the work zone should be provided for pedestrians and cyclists during the closure of Davenport Road and the partial closure of Bloor Street West during station construction.
  - Operations and Maintenance:
    - After GO Station opening, pedestrian and cyclist comfort in the Bloor-Lansdowne study area can be improved by maintaining clear, visible signage, good street illumination, and/or road markings designating pedestrian crossings, walkways, and designated bicycle routes;

- Due to the complex proposed layout of the Bloor-Lansdowne GO Station integrated with the existing GS, new connection to Lansdowne TTC Station, and multiple points of pedestrian/cyclist access to the GO Station, as well as proper signage and wayfinding is critical for this GO Station;
- Increasing the size of the pedestrian waiting areas at crosswalks at intersections where increases in pedestrian traffic is expected, such as at the intersection of Bloor Street West at St Helens Avenue, or at the intersection of Bloor Street West and Lansdowne Avenue, may be helpful in reducing crowding on active transportation facilities in the Bloor-Lansdowne study area;
- Efforts should be made to integrate the Bloor-Lansdowne GO Station with existing and proposed active transportation infrastructure;
- Winter maintenance on active transportation pathways, if conducted regularly, will enable the paths to remain as accessible active transportation route options for travelers at all times of the year. Additional lighting along these paths may increase pedestrian and cyclist comfort during nighttime or the winter;
- After GO Station opening, implementation of active transportation-supportive infrastructure and connections will be helpful in reducing pedestrian and cyclist discomfort stemming from increased traffic volumes in the Bloor-Lansdowne study area;
- Pedestrian and cyclist mode shares in the Bloor-Lansdowne study area are likely to increase following the completion of the Bloor-Lansdowne GO Station if efforts are made to connect the GO Station to existing pedestrian and cyclist infrastructure. The potential impacts of the pedestrian and cyclist bridge over Davenport Road on the traffic signals operations, and potential vehicle sightline obstructions in the Bloor-Lansdowne study area will be addressed during the detailed design stage; and
- The bridge will be designed such that its structure will minimize its impact on sightlines to existing traffic signals, enabling drivers to come to a safe stop at intersections.

- Kirby GO Station:
  - Construction – Development of above-mentioned CTMP.
  - Operations and Maintenance:
    - After GO Station opening, pedestrian and cyclist comfort in the Kirby study area can be improved by maintaining clear, visible signage, good street illumination, and/or road markings designating pedestrian crossings and designated bicycle routes;
    - Increasing the size of pedestrian waiting areas at crosswalks at intersections where increases in pedestrian traffic is expected, such as at the intersection of

Keele Street and Kirby Road, may be warranted to reduce crowding at the sidewalks near the intersection;

- Efforts should be made to integrate Kirby GO Station with existing pedestrian infrastructure;
- Consideration of connections on Keele Street and Kirby Road to Kirby GO Station should be given;
- Expansion of existing bicycle facilities on Keele Street, and construction on dedicated bicycle facilities on Kirby Street should also be undertaken;
- The implementation of the connection between the proposed TransCanada MUP and Kirby GO Station shown in the Preferred Design and the implementation of the envisioned improvements to the cycling infrastructure network detailed in the York Region TMP (York Region, 2016a) will ensure positive net effects of Kirby GO Station on pedestrian and cyclist ridership within the study area by providing active transportation connections to community destinations and relieving potential congestion on other active transportation facilities in the study area, including at intersection crosswalks and other crossings;
- Active transportation connections on Keele Street and Kirby Road to Kirby GO Station should be considered. Expansion of existing bicycle facilities on Keele Street, and construction on dedicated bicycle facilities on Kirby Street should also be undertaken;
- Implementation of the envisioned improvements to the cycling infrastructure network as detailed in the York Region TMP will also ensure positive net effects of Kirby GO Station on cyclist ridership within the Kirby study area (York Region, 2016a);
- Signalization of Access 3 by 2030, as discussed in the Kirby GO Station TTIA in Appendix I of Volume 4 of this EPR Addendum, can also help to relieve pedestrian discomfort while crossing Keele Street, by providing more routing options for pedestrians when travelling between the existing residential area east of Keele Street, and Kirby GO Station. Signalization of Access 3 could decrease travel distance for pedestrians using that access (relative to crossing at the existing intersections at Keele Street and Kirby Road, or at Keele Street and Peak Point Boulevard;
- After GO Station opening, implementation of active transportation-supportive infrastructure and connections will be helpful in reducing pedestrian and cyclist discomfort stemming from increased traffic volumes in the Kirby study area; and

- Pedestrian and cyclist mode shares in the Kirby study area are likely to increase following the completion of Kirby GO Station if efforts are made to connect Kirby GO Station to existing pedestrian and cyclist infrastructure. Mulock GO Station:
  - Construction – Development of above-mentioned CTMP.

- Operations and Maintenance:
  - After GO Station opening, pedestrian and cyclist comfort in the Mulock study area can be improved by maintaining clear, visible signage, good street illumination, and/or road markings designating pedestrian crossings and designated bicycle routes;
  - Increasing the size of the pedestrian waiting areas at crosswalks at intersections where increases in pedestrian traffic is expected, such as at the intersection of Mulock Drive and Steven Court/Kent Drive, may be warranted to reduce crowding at the sidewalks;
  - Effort should be made to integrate the Mulock GO Station with existing pedestrian infrastructure;
  - Consideration should be given to the connections to Audrie Sanderson Park south of the Mulock GO Station. The existing Tom Taylor/Nokiidaa Trail should be enhanced as it provides the closest pedestrian crossing west of the GO Station. Winter maintenance on the crossing should be given the same priority as surrounding sidewalks. Additional lighting at the existing Trail under Mulock Drive and signage indicating the presence of the crossing should be provided;
  - Effort should also be made to make connections between existing cycling infrastructure and the Mulock GO Station;
  - Implementation of the envisioned improvements to the cycling infrastructure network as detailed in the York Region TMP (York Region, 2016a) will also ensure positive net effects of the Mulock GO Station on cyclist ridership within the Mulock study area. These improvements include providing connections between the GO Station and the Tom Taylor/Nokiidaa Trail, coupled with Dennis Park, Stonehaven Avenue, and William Roe Boulevard;
  - After GO Station opening, implementation of active transportation-supportive infrastructure and connections will be helpful in reducing pedestrian and cyclist discomfort stemming from increased traffic volumes in the Mulock study area; and
  - Pedestrian and cyclist mode shares in the Mulock study area are likely to increase following the completion of the Mulock GO Station if efforts are made to connect the GO Station to existing pedestrian and cyclist infrastructure.

- Innisfil GO Station:
  - Construction – Development of above-mentioned CTMP.
  - Operations and Maintenance:
    - After GO Station opening, pedestrian and cyclist comfort in the Innisfil study area can be improved by maintaining clear, visible signage, good street illumination, and/or road markings designating pedestrian crossings and designated bicycle routes;

- Increasing the size of pedestrian waiting areas at crosswalks at intersections where increases in pedestrian traffic is expected, such as at the exits of the Innisfil GO Station, or the intersection of 6th Line and Webster Boulevard, may be warranted to reduce crowding at the sidewalks;
- Effort should be made to integrate the Innisfil GO Station with existing and planned pedestrian and cyclist infrastructure. Consideration should be given to the connections to the future trail system east of Innisfil GO Station;
- Implementation of the envisioned improvements to the cycling infrastructure network as detailed in the Town of Innisfil TMP and the Town of Innisfil Trails Master Plan will also ensure positive net effects of the Innisfil GO Station on cyclist ridership within the Innisfil study area. These improvements include providing connections between the GO Station and the future sidewalk and multi-use trail on 6th Line;
- Metrolinx will ensure that the recommendations regarding the maintenance and improvement of pedestrian facilities are shared with the Town of Innisfil for their consideration in enhancing active transportation connections in the Innisfil study area;
- After GO Station opening, implementation of active transportation-supportive infrastructure and connections will be helpful in reducing pedestrian and cyclist discomfort stemming from increased traffic volumes in the Innisfil study area; and
- Pedestrian and cyclist mode shares in the Innisfil study area are likely to increase following the completion of the Innisfil GO Station if efforts are made to connect the GO Station to existing pedestrian and cyclist infrastructure.

4.3.9.2.5 Transit Assessment

- Spadina-Front GO Station – not applicable for a Transportation Brief;
- Bloor-Lansdowne GO Station:
  - Construction:
    - The TTC should be notified well in advance of the Bloor-Lansdowne GO Station construction or road closures;
    - All road closures due to Bloor-Lansdowne GO Station construction should be coordinated with the TTC to identify the best detour routes for transit vehicles, and to minimize transit travel time while maintaining a high LOS for transit users; and
    - The TTC should consider notifying customers of potential travel delays and service disruptions in advance of the Bloor-Lansdowne GO Station construction.
  - Operations and Maintenance:
    - Bloor-Lansdowne GO Station provides an opportunity to increase transit ridership at Lansdowne TTC Station if transit connections are successfully optimized;

- Effective wayfinding between the Bloor-Lansdowne GO Station and Lansdowne TTC Station should be provided to ensure that passengers transferring between regional and local transit can move efficiently between routes. This includes updating signage at Lansdowne TTC Station to reflect additional transit connections from the TTC Station;
- The TTC may consider scheduling infrequent local transit services to align with scheduled GO train arrivals at the Bloor-Lansdowne GO Station to minimize passenger wait times; and
- Effectively facilitating transfers between the Bloor-Lansdowne GO Station and local transit routes by minimizing delay to passengers on the transit route when entering and exiting the GO Station, and by aligning the schedules of infrequent local transit routes to GO train arrival times, will serve to optimize the experience of transit users in the Bloor-Lansdowne study area.

- Kirby GO Station:
  - Construction:
    - York Region Transit (YRT) should be notified well in advance of Kirby GO Station construction or road closures;
    - All road closures due to Kirby GO Station construction should be coordinated with YRT to identify the best detour routes for transit vehicles, and to minimize transit travel time while maintaining a high LOS for transit users; and
    - York Region Transit (YRT) should consider notifying customers of potential travel delays and service disruptions in advance of Kirby GO Station construction.
  - Operations and Maintenance:
    - Increased travel times for transit vehicles caused by additional site-generated traffic may be experienced upon the opening of the GO Station;
    - Techniques to reduce the travel times of transit vehicles at these locations, such as transit pre-emption technology at traffic signals or high-occupancy vehicle lanes, may be beneficial in reducing delay at intersections on a route;
    - York Region Transit (YRT) should also consider scheduling infrequent local transit services to align with scheduled GO train arrivals at the Kirby GO Station to minimize passenger wait times; and
    - Effectively facilitating transfers between the Kirby GO Station and local transit routes by minimizing delay to passengers on the transit route when entering and exiting the GO Station, and by aligning the schedules of infrequent local transit routes to GO train arrival times will serve to optimize the experience of transit users in the Kirby study area.

- Mulock GO Station:
  - Construction:
    - York Region Transit (YRT) should be notified well in advance of Mulock GO Station construction or road closures;
    - All road closures due to Mulock GO Station construction should be coordinated with YRT to identify the best detour routes for transit vehicles, and to minimize transit travel time while maintaining a high LOS for transit users; and
    - York Region Transit (YRT) should consider notifying customers of potential travel delays and service disruptions in advance of Mulock GO Station construction.
  - Operations and Maintenance:
    - Increased travel times for transit vehicles caused by additional site-generated traffic may be experienced upon the opening of the GO Station;
    - Techniques to reduce the travel times of transit vehicles at these locations, such as transit pre-emption technology at traffic signals or high-occupancy vehicle lanes, may be beneficial in reducing delay at intersections on a route;
    - York Region Transit (YRT) should also consider scheduling infrequent local transit services to align with scheduled GO train arrivals at the Mulock GO Station to minimize passenger wait times; and
    - Effectively facilitating transfers between the Mulock GO Station and local transit routes by minimizing delay to passengers on the transit route when entering and exiting the GO Station, and by aligning the schedules of infrequent local transit routes to GO train arrival times will serve to optimize the experience of transit users in the Mulock study area.
- Innisfil GO Station:
  - Construction:
    - During construction, microtransit service providers and transit agencies operating routes within the Innisfil study area should be notified well in advance of Innisfil GO Station construction. Innisfil GO Station construction should be coordinated with transit agencies to identify any transit stops that may need to be removed or relocated in the vicinity of the work zone during construction.
  - Operations and Maintenance:
    - The Town of Innisfil may consider increasing the supply of microtransit drivers by creating a monetary registration bonus for any new drivers who register to supply microtransit services following the opening of the Innisfil GO Station;
    - There is also opportunity to increase the mode share of microtransit for travellers at the Innisfil GO Station by designating Innisfil GO Station as a “Key Destination” with a subsidized fare;

- Consideration should be given to increasing the number of PPUDO spaces specifically designated for microtransit vehicles;
- If crowding in the PPUDO area persists, dwell time in the PPUDO area should be restricted to reduce the number of vehicles in the PPUDO area at any given time. Signage may be useful in reducing dwell time in the PPUDO area; and
- When formalized local transit is developed for the Town of Innisfil at the Innisfil GO Station, local transit services should be scheduled to align with GO train and bus arrivals at the Innisfil GO Station to minimize passenger wait times. Aligning the schedules of local transit routes to GO train and bus arrival times will serve to optimize the experience of transit users in the Innisfil study area by facilitating transfers between transit services with minimal delay.

4.3.9.3 Monitoring Activities

For all GO Stations, ridership should be monitored to confirm mode share projections and ridership growth rates developed by Metrolinx. Ridership on local transit routes should also be monitored, and service frequency increased to accommodate increased ridership if necessary. Consideration should be given to improving active transportation infrastructure, increasing the number of parking spaces designated for carpool vehicles, or implementing other TDM strategies should the demand of parking supply exceed availability.

- Spadina-Front GO Station:
  - Following construction of the GO Station and local improvements, pedestrian and cyclist activity will be monitored to determine if additional measures are required; and
  - Monitor the effectiveness of the traffic management/control strategies and adjust as necessary during the construction period.
- Bloor-Lansdowne GO Station:
  - Transit time along routes interfacing with the Bloor-Lansdowne GO Station should be monitored, and service schedules adjusted if necessary; and
  - Waiting areas on the bus and subway platforms at Lansdowne TTC Station should be monitored for crowding.
- Kirby GO Station:
  - Parking lots should be monitored for excessive queuing at parking lot exits or confusion due to parking lot layout, so that mitigation measures can be identified if necessary; and
  - Crosswalks and other pedestrian infrastructure at the intersections of Keele Street at Kirby Road, and at Keele Street and Peak Point Boulevard, should be monitored for crowding issues.
- Mulock GO Station:

- Transit time along routes interfacing with the Mulock GO Station should be monitored, and service schedules adjusted if necessary; and
- The transit stops at the intersections of Steven Court/Kent Drive at Mulock Drive and Mulock Drive at Bayview Avenue should be monitored for crowding.

- Innisfil GO Station:
  - Monitoring should be undertaken to ensure that vehicular traffic on 6th Line remains unobstructed by construction activities for the duration of construction;
  - Construction progress should also be monitored closely and travelers in the Innisfil study area should be notified of any changes in construction schedule; and
  - Intersections and traffic volumes in the Innisfil study area should be monitored to identify delays incurred by either background traffic growth or site-generated traffic so that appropriate and timely mitigation measures such as signal timing changes can be developed and refined.

4.4 Impact Assessment, Mitigation and Monitoring Plan Summary

The impact assessment, mitigation and monitoring plan are summarized in Table 4-15 below.

Table 4-15: Impact Assessment, Mitigation and Monitoring Plan Summary

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
Wildlife, Terrestrial Habitat, Aquatic Habitat, and Significant Natural Areas – Pre-Construction and Land Clearing/Property Acquisition			
Significant Natural Areas	**All GO Stations:** Construction laydown areas and easements identified prior to GO Station construction could potentially result in the loss of or disturbance to, natural areas present within the GO Station study areas. **Spadina-Front** No removal of Significant Natural Areas, however they may be affected by adjacent land clearing. A small (0.09 ha) piece of the mineral cultural meadow ELC community is located within the Spadina-Front GO Station footprint. There are no effects anticipated for this piece of land. Some isolated vegetation removals will be required to accommodate the Spadina-Front GO Station. **Bloor-Lansdowne** No Significant Natural Areas are present within the Bloor-Lansdowne study area, although the Bloor-Lansdowne GO Station will involve the removal of 3.63 ha of ELC communities. A total of 0.79 ha of the ELC to be removed is RNFP area located within the north study area associated with the Earlscourt Park MUP bridge. Additionally, the ELC communities to be removed are comprised of the following: • 0.48 ha of Dry-Moist Old Field Meadow; • 0.48 ha of Green Lands; • 1.75 ha of Mineral Cultural Thicket; • 0.12 ha of Cultural Thicket; • 0.14 ha Dry-Fresh Exotic Deciduous Forest; and • 0.04 ha of Business Sector. **Kirby GO Station** Significant Natural Areas including, PSWs and Significant Woodlands are present within the Kirby study area. Although these areas will not be removed, they may be affected by	**All GO Stations** Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects. Additional mitigation measures are as follows: • Clearing and grubbing will occur and a detailed ESC Plan will be developed to limit damage to the remaining natural areas. • Retain existing vegetation within the GO Station study areas to the extent practicable. Vegetation removal will be kept to a minimum, limited to within the construction disturbance area and should be scheduled to occur outside of the breeding bird timing window of April 1 to August 31 of any given year; • Areas for vegetation removal will be refined during detailed design, if required (i.e., change in construction disturbance area, final staging areas); • Detailed clearing, ESC Plans and Restoration Plans will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects and approved Landscape Plans will be developed prior to construction; • Adhere to relevant OPSS for clearing and grubbing (OPSS 201), site preparation and tree protection (OPSS 801). When practicable, prune or top the vegetation instead of grubbing/uprooting, if required; • All work zones will be clearly marked on detailed design drawings and the ESC Plan to indicate that no work will occur outside the work zone; • All culverts, bridges and in-water structures will be designed to meet appropriate storm design requirements in order to avoid hydrologic affects; • All construction laydown areas and easements will be located to avoid natural features (Candidate and Confirmed) to the extent possible; • Where avoidance is not possible, any vegetation removal will occur in accordance with the timing windows; and • Any construction laydown areas or easements located within the Candidate or Confirmed Habitat of Endangered or Threatened Species will be subject to applicable requirements under the ESA, 2007. **In wetlands (Mulock and Kirby GO Stations):** • Where possible a setback from all developments of between 30-120 metres from all PSWs will be maintained. Setback distance will be determined through impact and	**All GO Stations** A qualified Environmental Inspector will conduct regular monitoring, to be defined prior to pre-construction landing clearing, to confirm that all activities are conducted in accordance with mitigation plans and all work is conducted from within the specified work zones. The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects. An Environmental Inspector will inspect and confirm ESC measures are functioning properly, that they are properly maintained throughout the construction phase and that all work is conducted from within the specified work zones.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	adjacent land clearing. The Kirby GO Station will involve the removal of 8.12 hectares (ha) of ELC communities, including: • 7.8 ha of Intensive Agriculture; • 0.2 ha of Cultural Meadow; and • 0.12 ha of Deciduous Forest. No removal of Significant Natural Areas, although they may be affected by adjacent land clearing. **Innisfil GO Station** No Significant Natural Areas are present within the Innisfil study area, although the Innisfil GO Station will involve the removal of 7.11 ha of Intensive Agricultural ELC communities. **Mulock GO Station** It is anticipated that portions of unevaluated wetlands and Significant Valleylands will be lost as result of the Mulock GO Station. The Mulock GO Station will involve the removal of 1.07 hectares (ha) of ELC communities, including: • 0.9 ha of Cultural Meadow; and • 0.17 ha of Meadow Marsh. Removal of portions of unevaluated wetlands.	mitigation analysis of individual wetlands and wetland components. All impacts, mitigation and proposed setbacks measures will be discussed with the TRCA and MNRF; and • Hydrology is of central importance to the ecological health, function and value of wetlands. Changes to the water balance directly influence the chemical and physical properties of these features, and in doing so determine the diversity of flora and fauna that can be present. Therefore, it is vital to preserve the water balance of wetlands to prevent detrimental changes resulting from development. Wetlands will be restored as necessary to maintain the stability and function of the wetland. Compensation measures will be determined in further consultation with the TRCA and MNRF. **In woodlands (Mulock and Kirby GO Stations):** • Applicable TPZs will be established in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects; • Barriers will be installed around trees to be protected using material approved by the affected municipality; and • No stockpiles, storage or disturbance to grade will occur within the TPZ to minimize soil compaction and root damage. • All construction laydown areas and easements will be located to avoid natural features (Candidate and Confirmed) to the extent possible; • Where avoidance is not possible, vegetation removal will occur in accordance with the timing windows; and • Any construction laydown areas or easements located within the Candidate or Confirmed Habitat of Endangered or Threatened Species will be subject to applicable requirements under the ESA, 2007. **In Valleylands (Mulock GO Station):** • Work on steep slopes will be limited to the extent possible. In areas subject to LSRCA regulations, detailed clearing, ESC Plans and Restoration Plans will be submitted to the LSRCA for voluntary review.	
Wildlife Habitat	**Spadina-Front, Bloor-Lansdowne, Innisfil GO Stations** No Candidate or Confirmed SWH are located within the Spadina-Front, Bloor-Lansdowne, or Innisfil study areas. **Mulock GO Station** Removal of portions of Significant and Candidate SWH and Habitat for SCC.	**All GO Stations** Compensation measures for habitats located within Natural Areas where habitats do not coincide with a Significant Natural Area will be developed, as appropriate. Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects., if habitat for SAR is identified during additional (future) field studies, mitigation measures for pre-construction land clearing will be implemented as follows:	**All GO Stations** An Environmental Inspector will conduct regular monitoring, to be defined prior to pre-construction landing clearing, to confirm that all activities are conducted in accordance with mitigation plans and all work is conducted from within the specified work zones.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	Kirby GO Station Portions of the Significant and Candidate SWH and Habitat for SCC may be removed. Most of these wildlife habitat features overlap with natural areas.	• Where habitats could not be identified due to access restrictions (i.e., reptile hibernacula, rare woodlands, seeps and springs), preconstruction surveys will be conducted. Any significant findings will be reported to the applicable municipality and the applicable conservation authorities. Compensation will be addressed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects; • Any vegetation clearing shall take place outside of the breeding bird timing window; generally, from April 1 to August 31 of any given year (Different windows may apply to habitats of SAR, subject to permitting requirements); • If clearing must occur within this window, a qualified Ecologist Ecologist/Avian Biologist will first search the affected area. Any active nests will be flagged and all clearing within the associated habitat will be avoided until the Ecologist/Avian Biologist confirms that the birds have fledged and the nest is no longer active; • If a nesting migratory bird (or SAR protected under the ESA) is identified within or adjacent to the construction site, regardless of the timing window, all activities will stop and the Contractor (with assistance from a qualified Ecologist/Avian Biologist) will discuss mitigation measures with the Environmental Inspector. In addition, Metrolinx will contact the MNRF and ECCC to discuss applicable mitigation measure options. The Contractor will proceed based on the mitigation measures established through discussions with Metrolinx, the MNRF and/or ECCC; and • Compensation measures for habitats located within Natural Areas where habitats do not coincide with a Significant Natural Area will be developed, as appropriate. Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects.	The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.
Species at Risk	**Spadina-Front, Bloor-Lansdowne, Mulock, Innisfil GO Stations** No areas identified as Candidate or Confirmed Habitat of Endangered and Threatened Species have been identified within the GO Station study areas. If SAR habitat is identified within the GO Station study areas as part of additional (future) field investigations, removal of this habitat may be subject to the ESA which prohibits the killing, harming or harassing of Endangered and Threatened species and destruction of their habitats. Mitigation measures are to be determined based on presence or absence of SAR. Detailed site surveys are required to determine the presence or absence of SAR.	**All GO Stations** All requirements of the ESA will be met, including the following: • Findings of site surveys will be reported to the MNRF; • During the detailed design phase, the GO Station construction (including pre-construction land clearing) will be designed to avoid the loss of any Confirmed Habitat of Endangered or Threatened Species to the extent possible. Where loss cannot be avoided, the MNRF will be contacted and all requirements under the ESA, will be met, including any species-specific registration, compensation and/or permitting requirements; • Timing windows for any necessary removal of any Confirmed Endangered or Threatened Species habitat will be developed in consultation with the MNRF in association with any self-registration or permitting requirements; and	**All GO Stations** Monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	• Background review and consultation with the MNRF (after survey windows were closed) has indicated ten Threatened or Endangered species to potentially reside within the Bloor-Lansdowne study area, four within the Spadina-Front study area, and six within the Innisfil study area. • Ten Threatened or Endangered species could potentially be residing with the Mulock study area. Targeted surveys were completed for Bobolink (*Dolichonyx oryzivorus*) and Meadowlark (*Sturnella magna*); no individuals were recorded. **Kirby GO Station** Areas identified as Significant and Candidate Significant Habitat of Endangered and Threatened species may be cleared. Removal of this habitat may be subject to the ESA which prohibits the killing, harming, or harassing of Endangered and Threatened Species and the destruction of their habitats.	• Should a SAR be encountered that is not identified on relevant permits, all work will cease within the immediate work area and the MNRF will be contacted. Detailed site surveys will be undertaken prior to GO Station construction to confirm the presence or absence of the following species: **Spadina-Front GO Station** Peregrine Falcon, Common Nighthawk, Chimney Swift and Barn Swallow. **Bloor-Lansdowne GO Station** Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Bank Swallow, Barn Swallow, Bobolink, Chimney Swift, Eastern Meadowlark, Eastern Hog-nosed Snake, and Butternut. **Kirby GO Station** Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Bank Swallow, Barn Swallow, Bobolink, Chimney Swift, Cerulean Warbler, Eastern Meadowlark, Jefferson Salamander; and Butternut. **Mulock GO Station** Eastern Small-foot Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Bank Swallow, Barn Swallow, Bobolink, Chimney Swift, Eastern Meadowlark and Butternut. **Innisfil Station** Little Brown Bat, Northern Myotis, Tri coloured Bat, Bank Swallow, Barn Swallow Eastern Meadowlark, and Butternut. **Bloor-Lansdowne, Kirby, Mulock, and Innisfil GO Stations** With regards to Butternut trees: • Detailed site investigations will be undertaken prior to GO Station construction to confirm whether any additional Butternut trees of all sizes (including seedlings) are present within 25 metres from the GO Station footprints (50 metres for the Innisfil GO Station); • During the detailed design phase, the GO Stations will be designed to avoid the removal of Butternut trees to the extent possible; • Register habitat damage or tree removal and submit a BHA to the MNRF. A BHA will be conducted for all Butternut trees that must be removed. All findings will be reported to the MNRF; and	

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		• Where loss of a retainable tree cannot be avoided, the MNRF will be contacted and all requirements under the ESA will be met through the preparation of a Butternut Compensation Planting Plan. Additional mitigation measures may apply once the recommended targeted surveys have been completed as part of additional (future) field investigations prior to GO Station construction.	
Nests of Migratory Birds	**All GO Stations** Clearing of trees, shrubs and ground vegetation has the potential to destroy or disturb nests of migratory birds which are protected under the MBCA.	**All GO Stations** Timing windows for tree and shrub removal that have been identified as part of the habitat of a SAR will be confirmed by the MNRF. To reduce the possibility of contravention of the MBCA, vegetation removal shall be scheduled to occur outside of the breeding bird timing window of April 1 to August 31 of any given year. Some birds may nest before and/or after this peak bird nesting season due to annual seasonal fluctuations. Therefore, if a nest of a migratory bird is found within the construction area outside of this nesting period it shall still receive protection. If vegetation must be removed during the breeding bird timing window: • Nest and nesting activity searches will be conducted in areas defined as simple habitat by a qualified Ecologist/Avian Biologist no more than 24 hours prior to vegetation removal. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (Cadman *et al*., 2007); • If an active nest or confirmed nesting activity of a migratory bird is observed in simple habitat, regardless of the timing window recommended, a species-specific buffer area following ECCC guidelines will be applied to the nest or confirmed nesting activity wherein no vegetation removal will be permitted until the young have fledged from the nest. The radius of the buffer will depend on species, level of disturbance and landscape context (MOECC, 2016) (Government of Canada, 2017b), which will be confirmed by a qualified Ecologist/Avian Biologist, but will protect a minimum of ten metres around the nest or nesting activity; and • The results of all nest searches will be documented at the end of each survey day in a Technical Memorandum, including information on the searcher, date, time conducted, weather conditions, habitat type, vegetation community type, observations of breeding activity, observations of confirmed nests including co-ordinates, and, if required, the buffer applied to identified breeding/nesting sites. If vegetation removal must occur in complex habitats within the above-listed timing windows and absolutely cannot be avoided, the same BMPs such as nest and nesting activity searches described above will be undertaken. Suitable human-made structures within the GO Station study areas should be inspected for evidence of active bird nests during the breeding bird timing window prior to the	**All GO Stations** An Environmental Inspector will conduct regular monitoring, to be defined prior to pre-construction land clearing, to confirm that activities do not encroach into nesting areas or disturb active nesting sites.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		onset of construction activities in order to determine appropriate nesting preventative measures (i.e., netting). Compensation measures for habitats located within Natural Areas where habitats do not coincide with a Significant Natural Area will be developed, as appropriate. Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects.	
Wildlife, Terrestrial Habitat, Aquatic Habitat, and Significant Natural Areas – Construction			
Significant Natural Areas, Wildlife Habitat and Species at Risk	**All GO Stations** Grading and soil disturbance during construction can lead to erosion and sedimentation within potential natural features and areas. This can affect the quality of habitat, and can disturb ground vegetation, thereby adversely affecting wildlife habitat. Stockpiled materials, equipment or construction activities could accidentally encroach into and disturb natural features and areas beyond the GO Station footprints. Additionally, soils beyond the GO Station footprints could also become compacted or disturbed if activities were to extend beyond the GO Station footprints.	**All GO Stations** A SMP will be prepared by a Qualified Professional as defined in O. Reg. 153/04 for managing soil materials on-site (includes excavation, location of stockpiles, reuse, and off-site disposal). • The SMP will include a strategy to prevent Bank Swallow nesting in stockpiled or exposed soils. All work zones will be clearly marked on detailed design drawings and the ESC Plan to indicate that no work will occur outside the work zone. The ESC measures will be implemented prior to GO Station construction and maintained during the construction phase in accordance with the ESC Plan. • If the ESC or dewatering measures are not functioning properly, no further work in the affected areas will occur until the problem is addressed. All disturbed areas within the construction site will be stabilized and re-vegetated as soon as conditions allow. The ESC measures will be left in place until all areas within the construction site have been stabilized and will then be removed. Wet weather restrictions shall be applied during site preparation and excavation. **Spadina-Front and Bloor-Lansdowne GO Stations** Erosion and sediment control (ESC) Plans and Dewatering Plans will be developed prior to GO Station construction in consultation with the TRCA and will conform to industry BMPs, as well as recognized standard specifications. The ESC Plan shall also take into account the ESC Guidelines for Urban Construction (2006). **Kirby GO Station** An ESC Plan and Dewatering Plan will be developed prior to construction in consultation with the TRCA and will conform to industry BMPs and recognized standard specifications. The ESC Plan shall also take into account the GGHACA Erosion and Sediment Control Guidelines for Urban Construction. The ESC Plan will outline a	**All GO Stations** An Environmental Inspector will conduct regular inspections, to be defined prior to GO Station construction, to confirm ESC measures are functioning properly and are properly maintained throughout the construction phase. An Environmental Inspector will conduct regular monitoring, to be defined prior to GO Station construction, to confirm that all activities are conducted in accordance with mitigation plans and all work is conducted from within the specified work zone.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		process of resolving issues of extended encroachment, including clean-up, maintenance of ESC measures, and consideration of alternative ESC measures. **Mulock** Erosion and sediment control (ESC) Plans and Dewatering Plans will be developed prior to GO Station construction in consultation with the LSRCA and will conform to industry BMPs and recognized standard specifications. The ESC Plan shall also take into account the Technical Guidelines for Stormwater Management Submissions (LSRCA, 2016). A Geohazard Assessment Report will be completed prior to detailed design of the Mulock GO Station to assess the erosion hazard and risk to river channel and bank stability potentially resulting the development of the Mulock GO Station. The Geohazard Assessment Report will inform the infrastructure and bank treatments required to manage these hazards. **Innisfil GO Station** Erosion and sediment control (ESC) Plans and Dewatering Plans will be developed prior to GO Station construction in consultation with the LSRCA and will conform to industry BMPs and recognized standard specifications. The ESC Plan shall also take into account the Technical Guidelines for Stormwater Management Submissions (LSRCA, 2016).	
	Kirby GO Station Amphibian and reptile injuries and mortalities associated with road crossings.	**Kirby GO Station** Mitigation measures outlined in Best Management Practices for Mitigating the Effects of Roads on Amphibian and Reptile Species at Risk in Ontario (MNRF, 2016), will be applied as required (i.e.: tunnels) to minimize effect of amphibian and reptile road crossings.	**Kirby GO Station** An Environmental Inspector will inspect and confirm the Amphibian and Reptile crossing measures are functioning properly. GO Station staff and maintenance contractors are responsible for ensuring the crossings are properly maintained throughout the operation phase.
	All GO Stations There is potential for spills of fuel or other hazardous materials to occur during refueling of construction equipment or other construction activities. This can potentially affect the groundwater quality, and the health of vegetation and wildlife within natural areas.	**All GO Stations** A Construction Emergency Response and Communications Plan will be developed and implemented prior to construction and followed throughout the construction phase (includes spill response plans). A Hazardous Materials and Fuel Handling Plan will be developed prior to GO Station construction, to confirm that fuels and other hazardous materials are handled and stored in a safe manner during the construction process. The plan will take into consideration the proximity to WHPA locations and associated Vulnerable Areas. Hazardous material and fuel storage, refueling and maintenance of construction equipment will occur within designated areas only.	**All GO Stations** Workers will report any instances of spills to their supervisors.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		A Spill Prevention and Contingency Plan will be developed and will be in place prior to construction of the GO Stations. Personnel will be trained in how to apply the plans and the plans will be reviewed on a regular basis to strengthen their effectiveness and facilitate continuous improvement. Spills or depositions into natural features will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. A hydrocarbon spill response kit will be on-site at all times during the work. Spills will be reported to the Ontario Spills Action Centre at 1-800-268-6060.	
	All GO Stations Disturbance to lands and vegetation clearing has the potential to introduce and allow for the spread of invasive species through natural areas. Invasive species can prevent other native species from becoming re established.	**All GO Stations** All requirements under the ISA will be met, including the following mitigation measures: • All disturbed areas within the construction site will be re-vegetated as soon as conditions allow; • A SMP will be prepared by a Qualified Professional as defined in O. Reg. 153/04 for managing soil materials on-site (includes excavation, location of stockpiles, reuse and off-site disposal); • In accordance with the SMP, topsoil will be stockpiled separately from other soil materials and used for restoration to facilitate natural regeneration of native species through preservation of the existing seed bank; • Where re-vegetation is required, a native seed mix, which does not contain invasive species, will be used; • Ash trees, leaves, logs, or wood chips will not be removed out of the Regulated Area, as identified on the CFIA website (CFIA, 2014). This is necessary to prevent the spread of the EAB to un-infested areas in Ontario. The Contractor must dispose of all wood at a registered Waste Facility; and • If extensive invasion of non-native species is identified as a result of the GO Stations, contingency measures may include an applicable herbicide application. A herbicide application plan will be developed as required and submitted to the conservation authority for review.	**All GO Stations** Areas of re-vegetation will require watering and will be monitored by an Environmental Inspector for at least two years to confirm at least an 80 percent survival rate and confirm that non-native and invasive species are not becoming pervasive as a result of the GO Stations, unless otherwise specified within the Vegetation Compensation Protocol for Metrolinx RER Projects.
	All GO Stations Tunnel construction will require dewatering and the discharge of extracted water to the environment. Dewatering may be required for other sub surface work.	**All GO Stations** All requirements under the OWRA, R.S.O. 1990, c. O.40 with respect to water taking, management and discharge to the quality of water discharging into natural receivers will be met, including the following mitigation measures and best practices: • Approval of water takings in accordance with the MOECC PTTW process or within the EASR framework.	**All GO Stations** An Environmental Inspector will be on-site during any dewatering within 120 metres of natural features. The Environmental Inspector will confirm that the filter bag is working appropriately and that no sediment is entering significant natural features.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		Spadina-Front and Bloor-Lansdowne GO Stations • Any discharge from dewatering will be discharged to a City of Toronto sewer in accordance with the applicable City of Toronto Sewer Use By-law. **Kirby, Mulock and Innisfil GO Stations** • Any discharge from dewatering should outlet to a vegetated area at least 30 metres from a significant natural feature or watercourse utilizing a sediment filter bag; • In the event of sediment discharge, all operations will stop immediately until the problem can be resolved; and • If significant changes in water levels/seepage areas are noted, operations will cease until water levels recover.	
	All GO Stations The development of the GO Stations will result in an increase of impermeable surface, which may lead to increased stormwater runoff. Further, the development has the potential to affect the existing water balance of the wetlands, woodlands and watercourses within the study area;	**All GO Stations** Changes to site water balance and specifically base water balance of natural features represent a risk to the ecological health and function of the natural features present. To mitigate the increase in runoff from the impervious areas, and the potential impact to natural features the Stormwater Management Plan will be designed to meet water balance targets, and provide the framework for safe conveyance of storm runoff from the site.	**All GO Stations** An Environmental Inspector will conduct regular inspections to ensure stormwater management measures are functioning properly, and are capable of maintaining the base water balance of natural features within the study area.
	All GO Stations Dust created as a result of construction has the potential to settle on adjacent vegetation, disturbing wildlife and their habitat.	**All GO Stations** Dust from the work areas will be controlled through suppressants (i.e., water).	**All GO Stations** An Environmental Inspector will conduct regular inspections of dust emissions, to be defined prior to GO Station construction, to confirm dust control watering frequency and rates are adequate.
	All GO Stations Noise, vibration and lighting associated with the construction of the GO Stations has the potential to affect sensitive flora and fauna, and the quality of their habitat.	**All GO Stations** To the extent possible construction equipment will be maintained and methods will be designed to avoid levels of noise, vibration and lighting that could represent an effect to sensitive flora and fauna.	**All GO Stations** An Environmental Inspector will conduct regular inspections of noise, vibration, and lighting levels to be defined prior to Project construction, to confirm levels are acceptable and represent a minimal effect to sensitive flora and fauna.
Nests of Migratory Birds	**All GO Stations** Clearing (removal) of trees and shrubs has the potential to disturb or destroy nests of migratory birds.	**All GO Stations** Vegetation (tree/shrub) clearing (removal) will take place outside of the breeding bird timing window generally from approximately April 1 to August 31 of any given year. It is noted that different windows may apply to habitats of SAR, which will be confirmed prior to GO Station construction, and potentially subject to permitting requirements.	**All GO Stations** An Environmental Inspector will regularly monitor construction to confirm that activities do not encroach into nesting areas or disturb active nesting sites.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		If clearing must occur within this window a qualified Ecologist/Avian Biologist will first search the affected area. Any active nests will be flagged and all clearing within the associated habitat will be avoided until the qualified Ecologist/Avian Biologist confirms that the birds have fledged and the nest is no longer active. If a nesting migratory bird (or SAR protected under the ESA) is identified within or adjacent to the construction site, regardless of the timing window, all activities will stop and the Contractor (with assistance from a qualified Ecologist/Avian Biologist) will discuss mitigation measures with the Environmental Inspector. In addition, Metrolinx will contact the MNRF and ECCC to discuss applicable mitigation options. The Contractor will proceed based on the mitigation measures established through discussions with Metrolinx, the MNRF and/or ECCC. The results of all nest searches will be documented at the end of each survey day in a Technical Memorandum, including information on the searcher, date, time conducted, weather conditions, habitat type, vegetation community type, observations of breeding activity, observations of confirmed nests including co-ordinates, and, if required, the buffer applied to identified breeding/nesting sites. If vegetation removal must occur in complex habitats within the above-listed timing windows and absolutely cannot be avoided, the same BMPs such as nest and nesting activity searches described above will be undertaken.	
Significant Valleylands	**Mulock GO Station** Any steep slopes associated with Valleylands could be disturbed by vegetation removal, grading work and the movement of large equipment which could result in erosion, slumping or slope failure.	**Mulock GO Station** Geotechnical studies will be completed prior to GO Station construction to identify any design and mitigation requirements in, and around, Valleylands. Detailed design plans will be submitted to the LSRCA for voluntary review in order to confirm that all work is in compliance with O. Reg. 166/06 and O. Reg. 179/06. Wet weather restrictions will be applied during site preparation and excavation. Work will be avoided in Valleylands during periods of excessive precipitation and/or excessive snow melt.	**Mulock GO Station** An Environmental Inspector will conduct regular inspections, to be defined prior to GO Station construction, to confirm that all work is conducted in accordance with plans and any recommendations provided through the conservation authority voluntary review.
Fish Habitat	**Mulock GO Station** The GO Station work carried out in, and around, water may potentially cause harm to harm fish. **Kirby GO Station** The GO Station work carried out in, and around, water may potentially cause harm to fish.	**Mulock and Kirby GO Stations** An Aquatic Habitat Assessment Report will be prepared prior to GO Station construction to identify specific effects and mitigation associated with detailed culvert and bridge design plans. All in-water work will be conducted in accordance with the timing windows to be identified in the Aquatic Habitat Assessment Report.	**Mulock and Kirby GO Station** An Environmental Inspector will conduct regular inspections, to be defined prior to GO Station construction, to confirm that all work is conducted in accordance with the *Fisheries Act* and any associated permits/approvals.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		The footprint of disturbed areas will be minimized to the extent possible. Vegetated buffers will be left in place adjacent to watercourses/waterbodies to the maximum extent possible. Wet weather restrictions will be applied during site preparation and excavation. Work will be avoided near watercourses during periods of excessive precipitation and/or excessive snow melt. All culverts, bridges and in-water structures will be designed to meet appropriate storm design requirements in order to avoid hydrologic affects. All requirements under the *Fisheries Act* will be met including any Self-Assessments or permitting.	
Tree Removal	**All GO Stations** Trees and shrubs present within the GO Station footprints (i.e. construction envelope) will require removal. The approximate removals based on field visits are as follows: **Spadina-Front** 498 **Bloor-Lansdowne** 2,692 (South study area) 841 (North study area) **Kirby** 316 **Mulock** 146 **Innisfil** 832	**All GO Stations** Metrolinx will coordinate compensation with public agencies through the implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects. Vegetation that is removed will be compensated for in accordance with the provisions of the Protocol for Municipal/Private Trees, trees within Metrolinx property, and trees within the conservation authority areas. An Arborist Report will be prepared as the design progresses to detail proposed works, impacts and removals per the GO Stations, on private, conservation authority, areas and municipal property.	**All GO Stations** Monitor success and tend to new plantings in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects. Restoration/Compensation and/or post-construction monitoring to assess condition of plantings/natural features implemented as part of the Vegetation Compensation Protocol for Metrolinx RER Projects. Monitoring of restoration areas for one year after installation. Deficiencies will be rectified within a one year period following the one year after installation.
Tree Injury/Tree Preservation	**All GO Stations** Impacts to trees adjacent to the work zone may result in tree injury. Deterioration of trees' vitality over time that are adjacent to the GO Station may occur. **Spadina-Front GO Station** Trees present within the six-metre buffer from the proposed Spadina-Front GO Station footprint may be impacted by the Spadina-Front GO Station if their minimum TPZ cannot be met. Or, tree injury occurs when either tree protection hoarding cannot be placed at the minimum required distance from the trunk due to constraints or conflicts. Given the current inventory of the Spadina-Front GO Station footprint, no trees have been identified for injury during construction.	**All GO Stations** An Arborist Report will detail protection and preservation (i.e., retention) measures for all trees to be preserved (i.e., establish TPZ and implement tree protection barriers). Measures beyond the standard tree protection hoarding may be required to protect trees where there is potential for 'tree injury' (i.e., a reduction in the minimum tree protection distance or work that may be required within a TPZ). These measures cannot be determined at this stage as detailed design drawings showing the limits of work (i.e., clearing, grading, etc.) are required to accurately determine the TPZ, identify which trees will be subject to potential injury, and which remedial measure would be most applicable. If determined that trees require pruning, trees shall be pruned in a manner that minimizes physical damage and promotes quick wound closure and regeneration. If earthworks are required immediately adjacent to a TPZ, and there is a potential to	**All GO Stations** Environmental Inspectors will be on-site during key construction activities (i.e., vegetation removal), as required, to ensure compliance with environmental requirements. The Environmental Inspectors will be responsible for: On-site inspection as required during construction to ensure that only specified trees and/or shrubs are removed, fencing is intact and there is no damage caused to the remaining trees and/or shrubs and adjacent vegetation communities. Construction and/or silt fencing will be repaired if it is damaged. Any damaged/injured trees and/or shrubs will be pruned through the implementation of proper arboricultural techniques, under supervision of an ISA Certified Arborist or Forester.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity

	Bloor-Lansdowne GO Station
	
	Tree injury occurs when either tree protection hoarding cannot be placed at the minimum required distance from the trunk due to constraints or conflicts, or where the minimum TPZ overlaps with the construction limits. Given the current inventory of the proposed Bloor-Lansdowne GO Station footprint, the following have been identified for injury:
	
	• South Section
	  ◆ Two trees (658 and 720) is located on City property within the six metres of the Bloor-Lansdowne GO Station footprint.
	• North Section
	  ◆ Four trees: 808, 809, 849 and 826 located within City Parkland and RNFP area within 12 metres of the Bloor-Lansdowne GO Station footprint; and
	  ◆ One tree (855) located on private property within six metres of the Bloor-Lansdowne GO Station footprint.
	
	Kirby GO Station
	
	Given that the current inventory of trees and other woody vegetation (i.e., shrubs) was only completed for the Barrie rail corridor which is largely associated with the proposed Kirby GO Station footprint, no trees and/or shrubs were identified for injury. Further assessments for tree and shrub injury, as a result of construction, will be carried out once PTEs are obtained.
	
	Mulock GO Station
	
	Tree injury occurs when either tree protection hoarding cannot be placed at the minimum required distance from the trunk due to constraints or conflicts, or where the minimum TPZ overlaps with the construction limits. Given the current inventory of the proposed Mulock GO Station footprint, the following have been identified for injury based on their TPZ relative to the Mulock GO Station footprint:
	
	• One tree situated on the Barrie rail corridor within ten metres of the Mulock GO Station footprint; and
		encounter roots, it is recommended that an exploratory exercise with an air spade be conducted.	

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	• One tree situated on private property, within ten metres of the Mulock GO Station footprint. The current inventory of trees and/or shrubs (i.e., woody vegetation) are located outside the proposed Mulock GO Station footprint, but are within the ten metre buffer and have been identified for preservation (i.e., retention): • Two shrubs with DBH measurements less than ten cm DBH situated within the Barrie rail corridor, but within ten metres from the Mulock GO Station footprint; • One tree with DBH greater than ten cm situated on the Barrie rail corridor within ten metres of the Mulock GO Station footprint; • Two trees with DBH greater than ten cm situated on private property within ten metres of the Mulock GO Station footprint; and • Two trees situated on public property within the ten metre buffer from the Mulock GO Station footprint. **Innisfil GO Station** Tree injury occurs when either tree protection hoarding cannot be placed at the minimum required distance from the trunk due to constraints or conflicts, or where the minimum TPZ overlaps with the construction limits. Given that the current inventory of trees and other woody vegetation (i.e., shrubs) was only completed for the Barrie rail corridor, which is largely associated with the Innisfil GO Station footprint, no trees and/or shrubs were identified for injury. Further assessments for tree and shrub injury, as a result of construction, will be carried out once PTEs are obtained as discussed previously. The current inventory of trees and/or shrubs (i.e., woody vegetation) was only completed for the Barrie rail corridor. Nonetheless, the following trees and/or shrubs are located outside the Innisfil GO Station footprint within the six-metre buffer area and have been identified for preservation (i.e., retention): • Four trees equal to or greater than ten cm DBH; and • 14 trees less than ten cm DBH.		

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
Wellhead Protection Areas (WHPA-D)	**Mulock GO Station** Though the Mulock GO Station study area is within a WHPA, transportation infrastructure is not subject to Source Water Protection regulations as it is unlikely to cause negative effects. However, there is potential for spills of fuels or other hazardous materials to occur during fueling of construction equipment or other construction activities. This can affect groundwater quality.	**Mulock GO Station** Prior to Mulock GO Station construction a Hazardous Materials and Fuel Handling Plan will be developed to confirm that fuels and other hazardous materials are handled and stored in a safe manner during the construction process. The plan will take into consideration the proximity to WHPA locations and associated Vulnerable Areas.	**Mulock GO Station** An Environmental Inspector will conduct regular inspections, to be defined prior to Mulock GO Station construction, to confirm that hazardous material transport and refueling is conducted outside of WHPAs and in accordance with the Hazardous Materials and Fuel Handling Plan.
Wildlife, Terrestrial Habitat, Aquatic Habitat, and Significant Natural Areas – Operations and Maintenance			
Significant Natural Areas, Wildlife Habitat, Species at Risk and Nests of Migratory Birds	**All GO Stations** Grading or earth moving required for maintenance purposes can result in erosion and sedimentation within adjacent natural features and areas, degrading habitats and harming vegetation and wildlife.	**All GO Stations** Any major maintenance work that would result in the replacement or upgrade of major infrastructure components requiring earth-moving will be conducted in accordance with the applicable mitigation measures listed under the construction phase. Any required permitting or authorizations will be obtained, as required.	**All GO Stations** Monitoring will be undertaken subject to the scale of the maintenance work. Monitoring similar to that required during construction may be required for large-scale maintenance and replacement work.
	All GO Stations Routine vegetation management practices carried out by Metrolinx for the safe operation of the Barrie rail corridor will be undertaken to keep the corridor ROW clear and free of any vegetation that could disrupt sight lines or interrupt the movement of train traffic. Trees adjacent to the rail ROW may need to be trimmed and new vegetation may need to be cleared. Trimming has the potential to harm healthy trees and allow disease or rot to expand. Use of chemical pesticides to maintain areas around the GO Station also has the potential to affect groundwater and adjacent natural features and areas if not applied correctly.	**All GO Stations** Any herbicide applications to clear vegetation within the corridor ROW will be applied in accordance with industry BMPs and regulations including conservation authority requirements. If herbicides are applied, only staff certified in their application will undertake the work. Herbicides will not be applied on windy days when there is greater potential for drift to adjacent natural areas. Any tree clearing or limb trimming will be limited to meet necessary safety clearances. Trees will be trimmed by a Qualified Professional to limit tree damage.	**All GO Stations** Contractors, GO Station staff and maintenance contractors are responsible for monitoring the effects of trimming and herbicide application. Any significant concerns will be reported to superiors for timely resolution.
	All GO Stations Spills of fuel and other hazardous materials (i.e., de-icing substances during winter months, pesticides, etc.) could occur as a result of maintenance activities. Spills have the potential to affect potential ground and surface water quality and kill or harm vegetation and wildlife.	**All GO Stations** An Emergency Response and Communications Plan will be developed and followed throughout the operations and maintenance phase (includes spill response and contingency plans). Metrolinx will develop spill prevention and contingency plans for the GO Station. Personnel will be trained in how to apply the plans and the plans will be reviewed on a regular basis to strengthen their effectiveness and facilitate continuous improvement. Hazardous material and fuel storage, refueling and maintenance of equipment will occur within designated areas only. Spills or depositions into natural features/areas will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency	**All GO Stations** GO Station staff and maintenance contractors are responsible for reporting spills and other issues and ensuring their timely resolution.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		plan. A hydrocarbon spill response kit will be on-site at all times during the work. Spills will be reported to the Ontario Spills Action Centre at 1-800-268-6060.	
Tree Removal/ Injury/Preservation	**All GO Stations** Deterioration of tree vitality over time for trees and/or shrubs that are adjacent to the GO Stations (including the section of the Barrie rail corridor) was the only identified effect due to the GO Sations during the operations/maintenance phase of the Project. It is noted that new growing conditions (i.e., new exposure to wind, sunscald and root damage) may result in failure of trees or their branches.	**All GO Stations** Maintenance, seasonal pruning or removal may be required to prevent woody material falling onto the Barrie rail corridor, parking areas, or GO Station properties. Pruning and felling will be carried out by or under the direction of an ISA Certified Arborist. Tree and shrub replacement may be required to compensate adjacent landowners if the condition of off-site trees and shrubs deteriorates as a result of GO Station implementation. Compensation will be determined in accordance with the Vegetation Compensation Protocol.	**All GO Stations** Routine inspections to identify dead trees or limbs adjacent to and within the GO Station properties (including the Barrie rail corridor and GO Station parking areas) that require removal or maintenance (i.e., pruning) for safety. An ISA Certified Arborist will inspect and assess trees on-site and on lands immediately adjacent annually (at minimum) from Metrolinx property.
Wellhead Protection Areas (WHPA-Q)	**Mulock and Kirby GO Stations** The Mulock and Kirby GO Station study areas are within a WHPA-Q. Within areas classified as WHPA-Q activities that reduce recharge represent a water quantity threat.	**Kirby GO Station** Recharge within the study area will be maintained to the extent possible. The TRCA will be consulted regarding any potential requirements for recharge management related to parking lots and buildings that will be constructed as part of the Project. The MOECC will also be consulted regarding demand (i.e. water taking) requirements specific to source protection in the Source Protection Plans. **Mulock GO Station** Recharge within the study area will be maintained to the extent possible. The LSRCA will be consulted regarding any potential requirements for recharge management related to parking lots and buildings that will be constructed as part of the Mulock GO Station. The MOECC will also be consulted regarding demand (i.e. water taking) requirements specific to source protection in the Source Protection Plans.	**Kirby GO Station** Recharge with the study area will be monitored regularly to ensure compliance with the TRCA recharge management policies and the demand requirements of the Approved Source Water Protection Plan for the CTC Source Water Protection Area. **Mulock GO Station** Recharge with the study area will be monitored regularly to ensure compliance with the LSRCA recharge management policies and the demand requirements of the Source Protection Plan for the Lakes Simcoe and Couchiching/Black River Source Protection Area.
Archaeological Resources – Construction			
Areas of Archaeological Potential	**All GO Stations** Land-disturbing construction activities have the potential to impact known and/or potential archaeological resources in areas of archaeological potential identified in Stage 1 AA, Appendix D of Volume 2 through Volume 6 of this EPR Addendum.	**All GO Stations** If final limits of the GO Stations are altered and fall outside the current study areas, an additional Stage 1 AA is required to assess the new footprint. **Spadina-Front GO Station** Areas determined to be undisturbed will be subjected to a Stage 2 AA in accordance with Section 2.1.2 of the 2011 S&G prior to construction activities to ensure no CHRs will be impacted. Areas determined to be disturbed do not require further assessment. Should deeply buried archaeological materials be encountered during construction, all work will cease and a professionally licenced archaeologist will be consulted to assess the cultural heritage value and significance of the archaeological deposits.	**All GO Stations** The Environmental Inspector shall monitor land-disturbing activities to confirm they remain within the GO Station study areas subject to the AA(s). Any site personnel responsible for carrying out or overseeing land-disturbing activities shall be informed of their responsibilities in the event that an archaeological resource is encountered.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		Areas identified to contain deeply buried archaeological potential must be subjected to a Stage 2 AA in accordance with Section 2.1.7 of the 2011 S&G prior to construction activities. **Bloor-Lansdowne GO Station** Areas determined to be undisturbed will be subjected to a Stage 2 AA in accordance with Section 2.1.1 and 2.1.2 of the 2011 S&G prior to construction activities to ensure no CHRs will be impacted. Areas determined to be disturbed and previously assessed lands that were deemed clear from further assessment do not require further AA. Should deeply buried archaeological materials be encountered during construction, all work will cease and a professionally licenced archaeologist will be consulted to assess the cultural heritage value and significance of the archaeological deposits. Areas that hold archaeological potential for deeply buried archaeological resources must be subjected to a Stage 2 AA in accordance with Section 2.1.7 of the 2011 S&G prior to construction activities. As identified by P057-0837-2016, the Bloor-Lansdowne study area includes lands that may contain remnants of a historic cemetery related to the St Helens Roman Catholic Church. As such, lands within ten metres of known cemeteries require completion of a Cemetery Investigation prior to any proposed ground disturbance. A Stage 2 AA of these lands is required with additional archival research. **Kirby GO Station** Areas determined to be undisturbed will be subjected to a Stage 2 AA in accordance with Sections 2.1.2 of the 2011 S&G prior to construction activities to ensure no cultural heritage resources will be impacted. As identified by TLA in their assessment, a Stage 2 test pit survey at 5 meter intervals, in accordance with Sections 2.1.2 of the 2011 S&G prior to construction activities to ensure no cultural heritage resources will be impacted, is required of the woodland area within the study area as no previous assessment was conducted within the property. Areas determined to be disturbed do not require further assessment. Areas previously assessed by TLA do not require further Stage 2 or 3 archaeological assessment, however they do fall subject to predevelopment topsoil removal, see recommendation 5.	

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		As per the York Region Archaeological Management Plan (York Region, 2014), the predevelopment topsoil removal (stripping) within the study area is required of lands that are located within 1,000 metres of documented village sites and 300 metres of any current or former water source (see Figure A-11 in Volume 4 - Appendix D of this EPR Addendum). This stripping shall occur after Stage 2 AA and potential subsequent assessments have been conducted. If the final limits of the Kirby GO Station are altered and fall outside the current study area, an additional Stage 1 AA is required to assess the new footprint. **Mulock GO Station** Areas determined to be undisturbed will be subjected to a Stage 2 AA test pit survey in accordance with Section 2.1.2 of the 2011 S&G prior to construction activities to ensure no CHRs will be impacted. Areas determined to be disturbed do not require further assessment. Areas that were previously assessed and determined to hold low potential do not require further AA. **Innisfil GO Station** Areas determined to be undisturbed, as well as identified by P316-083-2010, will be subjected to a Stage 2 AA in accordance with Sections 2.1.1 and 2.1.2 of the 2011 S&G prior to construction activities to ensure no CHRs will be impacted. Areas previously assessed by P057-0803-2015 do not require further AA as they have been subjected to subsequent Stage 3 and 4 AA. Areas determined to be disturbed do not require further assessment.	
Archaeological Resources – Operations and Maintenance			
Archaeological Resources Lands	**All GO Stations** Upon completion of construction, no potential effects related to archaeological resources are anticipated.	**All GO Stations** No mitigation measures are required.	**All GO Stations** No monitoring activities are required,
Cultural Heritage Resources – Construction			
Areas of Cultural Potential	**All GO Stations** **Spadina-Front GO Station** Potentially directly affected properties: None. Potentially indirectly affected properties:	**<u>Directly Affected Properties</u>** **Innisfil GO Station** 1350 6th Line – The property at 1350 6th Line is designated under the Part IV of the OHA (By-Law 037-11) and a Statement of Cultural Heritage Value or Interest, with a list of heritage attributes, is outlined in the designation by-law. During detailed design the	**Innisfil GO Station** • 1350 6th Line (IN-1) - The HIA may identify monitoring recommendations. These monitoring recommendations will be implemented. Vibration monitoring recommendations were made for the following properties within the vibration ZOI:

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	• Bathurst Street Bridge – Outside of the vibration ZOI, no potential effects anticipated. • Draper Street, Heritage Conservation District – Within the vibration ZOI, potential indirect effects may result from construction vibrations. • 517 Wellington Street West/31 Portland Street – Outside of the vibration ZOI, no potential effects anticipated. • Fort YorkNational Historic Site of Canada – Outside of the vibration ZOI, no potential effects anticipated. • 532/530 Front Street West – Within the vibration ZOI, potential indirect effects may result from construction vibrations. **Bloor-Lansdowne GO Station** Potentially directly affected properties: • 226 St Helens Avenue - The recommended outcome of the Cultural Heritage Evaluation of the property at 226 St Helens Avenue in the City of Toronto is that it does not meet the criteria set out under the criteria of O. Reg. 9/06 or O. Reg. 10/06. No potential effect on CHVI. • Earlscourt Park - The recommended outcome of the Cultural Heritage Evaluation of the property at Earlscourt Park in the City of Toronto is that it does not meet the criteria set out under the criteria of O. Reg. 9/06 or O. Reg. 10/06. No potential effect on CHVI. Potentially indirectly affected properties: • 158 Sterling Road – Outside of the vibration ZOI, no potential effects anticipated. • 222 Lansdowne Avenue – Outside of the vibration ZOI, no potential effects anticipated. • 87 Wade Avenue – Within the vibration ZOI, potential indirect effects may result from construction vibrations. • 213 Sterling Road – Outside of the vibration ZOI, no potential effects anticipated. • 163 Sterling Road – Within the vibration ZOI, potential indirect effects may result from construction vibrations.	property will undergo a CHER to evaluate it against O.Reg.10/06 (for provincial significance) and an HIA. A HIA will be completed for 1350 6th Line during detailed design. The HIA will: identify and assess potential project-related impacts on the CHVI and heritage attributes of the property; discuss alternatives considered and recommend the best alternative; and, provide mitigation measures to avoid or reduce impacts on the CHVI and heritage attributes. **Indirectly Affected Properties** In July 2018 CHARs were prepared for Spadina-Front, Bloor-Lansdowne and Kirby GO Stations to build on the findings of the CHSR and to identify potential adverse impacts to identified cultural heritage resources and to recommend mitigation measures to lessen of avoid any identified impacts. Based on the results of the CHARs, the following mitigation measures will be undertaken. Potential indirect effects due to construction vibration were identified for the following properties within the vibration Zone of Influence (ZOI): **Spadina-Front GO Station** • Draper Street HCD properties; and • 532/530 Front Street West. **Bloor-Lansdowne GO Station** • 87 Wade Avenue; and • 163 Sterling Road. In order to mitigate potential indirect impacts from construction vibrations, the following mitigation measures will be undertaken: • Pre-construction consultations between the applicant and owners/occupants; • Pre-construction measurements of background vibration levels; • Pre-condition survey by means of a photographic record of potentially affected structure façades and all surfaces, including visible sections of building foundations, building cladding, doors, windows, interior wall finishes, surface pavement, sidewalks, signs and trees. Each of the elements should be rated on their general condition (new, good, fair, poor, severe), and visible defects will be photographed; and • Work that may exceed the vibration limits outlined in the City of Toronto By-law No. 514-2008 or that may cause structural damage should be monitored.	**Spadina-Front GO Station** • Draper Street HCD properties; and • 532/530 Front Street West **Bloor-Lansdowne GO Station** • 87 Wade Avenue; and • 163 Sterling Road Work that may exceed the vibration limits outlined in the City of Toronto By-law No. 514-2008 (all of the abovenoted properties are located in the City of Toronto) or that may cause structural damage will be monitored.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	Kirby GO Station Potentially directly affected properties: • 11390 Keele Street - The recommended outcome of the Cultural Heritage Evaluation of the property at 11390 Keele Street in the City of Vaughan is that it does not meet the criteria set out under the criteria of O. Reg. 9/06 or O. Reg. 10/06. No potential effect on CHVI. Potentially indirectly affected properties: • 2480 Kirby Road – Outside of the vibration ZOI, no potential effects anticipated. • 11320 Keele Street – Outside of the vibration ZOI, no potential effects anticipated. **Mulock GO Station** Potentially directly affected properties: None. Potentially indirectly affected properties: None. **Innisfil GO Station** Potentially directly affected properties: • 1350 6th Line – the Innisfil GO Station will be constructed on a portion of the property east of the farmhouse. • John Cowan Overpass - The recommended outcome of the Cultural Heritage Evaluation of the John Cowan Overpass along 6th Line over the Barrie rail corridor in the Town of Innisfil is that it does not meet the criteria under O. Reg. 9/06 or O. Reg. 10/06 of the OHA. Potentially indirectly affected properties: • 1323 6th Line - The recommended outcome of the Cultural Heritage Evaluation of the property at 1323 6th Line is that it does not meet the criteria set out under O. Reg. 9/06 or O. Reg. 10/06 of the OHA.	These recommendations are consistent with the mitigation measures outlined in the Noise and Vibration Impact Assessment which forms part of the EPR Addendum for this Project. A Noise and Vibration Control Plan will be developed for the Project prior to construction. All measures outlined in the Noise and Vibration Control Plan will be implemented for the properties of known and potential CHVI that fall within the vibration ZOI.	

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
Cultural Heritage Resources – Operations and Maintenance			
Cultural Resources Lands	**All GO Stations** Upon completion of construction, no potential effects related to cultural resources are anticipated.	**All GO Stations** No mitigation measures are required.	**All GO Stations** No monitoring activities are required,
Social-Economic and Land Use – Pre-Construction and Land Clearing/Property Acquisition			
Existing Land Use, Community Services, Amenities and Resources	**Spadina-Front GO Station** No property acquisition is anticipated for the new Spadina-Front GO Station. **Bloor-Lansdowne GO Station** Acquisition of approximately 1.0 ha of land zoned as mixed use area, approximately 0.05 ha of land zoned as utility/transportation, and approximately 0.5 ha of land zoned as industrial, resulting in: • Altered property value. • Reduced buffer between the Barrie rail corridor and adjacent land use. • Decreased future development potential. • Loss of secondary structures or amenity areas such as sheds, patios, gardens, parking areas or fences on residential and other commercial properties. • Inconvenience associated with the need to relocate (applies to full buy-out of single commercial property). • Loss of customer parking or reduced delivery areas for commercial lands. **Kirby GO Station** Acquisition of approximately 8.1 ha of land zoned as agricultural, resulting in: • Direct loss of property. • Direct loss of active agricultural land. • Direct loss of natural areas. • Loss of vegetation or other visual buffers which currently screen views of the Barrie rail corridor.	**All GO Stations** Metrolinx is establishing a Vegetation Compensation Protocol for RER projects and vegetation that is removed will be compensated for in accordance with this Protocol, as documented in the TIP (BRCE EPR Addendum, Volume 2 through Volume 6, Appendix C). Where appropriate, Metrolinx will seek to develop an aesthetically pleasing design for public facing infrastructure in consultation with the City of Vaughan and adjacent landowners. Specific property requirements will be confirmed prior to GO Station construction to determine predicted property impacts. Property acquisition required for the GO Stations will be undertaken by Metrolinx, with the objective of providing fair market value compensation to affected property owners in accordance with applicable laws. Mitigation measures will be developed in consultation with individual owners, as required.	**All GO Stations** No monitoring activities are required.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	Mulock GO Station Acquisition of approximately 8.6 ha of land zoned as employment and approximately 0.3 ha land zoned as commercial resulting in: • Altered property value. • Reduced buffer between the Barrie rail corridor and adjacent land use. • Decreased future development potential. • Loss of secondary structures or amenity areas such as sheds, patios, gardens, parking areas or fences. • Inconvenience associated with the need to rebuild lost structures. • Inconvenience associated with the need to relocate (applies to full buy-out of single commercial property). • Loss of customer parking or reduced delivery areas on affected commercial and industrial lands. **Innisfil GO Station** Acquisition of approximately 6.4 ha land zoned as agricultural and and approximately 0.08 ha of land zoned as open space resulting in: • Some reduction in productivity, yields and income for farm owners. • Potential to disrupt farm land.		

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
Current Development Applications	**Spadina-Front GO Station** There are 35 development applications within the Spadina-Front study area. No potential conflicts are expected in the Spadina-Front GO Station footprint. Coordination is required for the development at 400 Front Street West, as it involves decking over the existing active rail corridor to accommodate development, while maintaining the rail activities. **Bloor-Lansdowne GO Station** There are 18 development applications within the Bloor-Lansdowne study area. Potential conflicts may occur with two development applications: • 158 Sterling Road (Employment land conversion of a former industrial site to a mixed-use development with 52,000 square metres of non-residential gross floor area and 50,000 square metres of residential); and • 1800 Davenport Road (proposed single-storey industrial units). **Kirby GO Station** There are three development applications within the Kirby study area. No potential conflicts were identified as no development applications are situated within the Kirby GO Station footprint. **Mulock GO Station** There are four development applications within the Mulock study area. A potential conflict may occur with the development located at the western terminus of Silken Laumann Drive, west of the hydro corridor, which is adjacent to the southern limit of the Mulock GO Station footprint. **Innisfil GO Station** There are no development applications as of July 18, 2018 therefore no potential conflicts.	**Spadina-Front, Bloor-Lansdowne and Mulock GO Stations** Confirm potential conflicts. Engage and negotiate with appropriate parties regarding land acquisition in advance of GO Station construction. **Kirby and Innisfil GO Station** As there are no predicted effects during the acquisition prior to construction phase, no mitigation is required.	**All GO Stations** No monitoring activities are required.
Social-Economic and Land Use – Construction			
Existing Land Use, Community Services, Amenities and Resources	**All GO Stations** Traffic:	**All GO Stations** Mitigation measures will be taken as documented in TTIAs (BRCE EPR Addendum, Volume 2 through Volume 6, Appendix I).	**All GO Stations**

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	• Effects are documented in the TTIAs (BRCE EPR Addendum, Volume 2 through Volume 6, Appendix I); • Temporary hauling routes, partial lane closures causing access restrictions to affected residences, parks, businesses, institutions, local transit routes, and the station itself; • Pedestrians and cyclists may be negatively impacted by partial lane closure as they may be required to detour to avoid construction areas; • Delays at some intersections along the detour route resulting from additional detoured traffic volumes; **Bloor-Lansdowne GO Station** • Vehicles may be detoured on Dundas Street West and College Street; **Kirby GO Station** • Vehicles may be detoured around Kirby Road via Teston Road, Jane Street, King Vaughan Road, and Keele Street; and • Expected road closures are at nighttime over a short period of time. **Mulock GO Station** • Nighttime closure over a short period, and vehicles detoured along Eagle, Yonge Street and Bayview Avenue; and **Innisfil GO Station** • Vehicles may be detoured following any road closures.	Adequate construction hauling routes will be determined in consultation with the municipalities. Site-specific Traffic Control and Management Plans will be prepared and implemented prior to GO Station construction to maintain reasonable access through work zones, as much as possible. Where it is not possible to maintain access, Metrolinx will consult directly with the affected property owners to establish a suitable mitigation strategy to be implemented.	Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction zones. Pedestrian and cyclist access areas within the construction work zone will be monitored to ensure they remain clear of obstructions and barriers to accessibility.
	All GO Stations Temporary nuisance effects due to increased noise, dust, and vibration which has the potential to affect the enjoyment of property in affected residential, commercial, institutional, recreational and other sensitive land use areas. • Expected air quality effects to lands surrounding the GO Station are expected to be negligible as documented in the AQIAs (BRCE EPR Addendum, Volume 2 through Volume 6, Appendix G).	**All GO Stations** Mitigation measures will be taken as documented in the AQIAs (BRCE EPR Addendum, Volume 2 through Volume 6, Appendix G) and in the NVIAs (BRCE EPR Addendum, Volume 2 through Volume 6, Appendix H). Construction-related noise, vibration, dust and diminished air quality effects will be managed to confirm compliance with provincial regulations and local by-laws. Timing restrictions will be in place to limit the time of day for construction activities, as required by municipal by-laws.	**All GO Stations** Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction work zones. Metrolinx to continue consultation with the municipalities and adjacent land owners during construction.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	• Expected noise and vibration effects are documented in the NVIAs (BRCE EPR Addendum, Volume 2 through Volume 6, Appendix H).	Construction schedule delays will be avoided to the extent possible in order to minimize the time over which construction will occur. All stockpiled materials will be fenced and the construction footprint area will be minimized to confirm that the construction zone does not extend beyond that which is necessary.	
	All GO Stations Temporary encroachment on adjacent lands for construction purposes (i.e., access, establishment of equipment storage/laydown areas, stockpiling of materials, etc.) through the use of construction easements or TLIs.	**All GO Stations** A review will be completed during the detailed design phase to identify temporary easements/TLIs for construction or other purposes, and permanent property acquisition requirements to accommodate the GO Station work. Construction will be planned to limit the need for construction easements/TLIs to the extent possible. Metrolinx will engage and negotiate with affected land owners regarding easements/TLIs required.	**All GO Stations** Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction work zones. Monitoring will continue throughout the construction phase until activities are complete and all exposed soils have been stabilized and all construction waste has been cleaned up.
	All GO Stations Utilities – may require possible relocation and/or service interruptions to nearby properties. Protection of utility infrastructure may also be necessary. These effects could be either temporary or permanent. **Spadina-Front GO Station** Ten private and 14 municipal potential utility conflicts were identified. **Bloor-Lansdowne GO Station** Private (27) (Bell, Gas, Hydro, Rogers) and 13 municipal (sewer combined, storm, water) potential utility conflicts were identified at the Bloor-Lansdowne GO Station. **Kirby GO Station** Private (29) potential conflicts and 23 municipal potential utility conflicts were identified at the Kirby GO Station. **Mulock GO Station** Private (13) (Bell, Gas, Rogers) and nine municipal (sanitary, storm, water) potential utility conflicts were identified at the Mulock GO Station. It should be noted that the Mulock GO Station is in conflict with a Hydro One utility corridor.	**All GO Stations** All temporary utility support and utility protection designs will achieve deflection requirements as well as horizontal and vertical clearance requirements of the utility authority for the protection of the utility. Coordination with the appropriate regional or municipal authority and utility authorities will be scheduled to ensure that all the necessary approvals and permits are obtained without delay to the construction schedule. Prior to the commencement of any operation affecting their system, the appropriate regional or municipal authority will be provided a notice of intention to commence the Work. A Designated Substances Survey for any structures that require demolition will be undertaken. All abatement/ management plans for these substances will be developed in accordance with the OHSA, R.S.O. 1990 (MOL) and regulations. The Design-Builder will be required to obtain locates for underground utilities prior to commencing construction works and to report any discrepancies between locate information and the Agreement to Metrolinx. If any utility-related redesign is requested by the Design-Builder for their convenience, the Design-Builder will be responsible for acquiring the design approval from Metrolinx and the authority having jurisdiction.	**All GO Stations** Utility requirements to be monitored in conjunction with the detailed GO Station design and constructions requirements.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	Innisfil GO Station Three unknown potential utility conflicts were identified at the Innisfil GO Station.		
Existing Visual Characteristics	**All GO Stations** Temporary visual effects to residential and other visually-sensitive land uses such as parks and places of worship caused by temporary storage sites for equipment, staging/laydown areas, stockpiling of materials, etc.	**All GO Stations** Construction schedule delays will be avoided to the extent possible to minimize construction duration and corresponding visual impacts. All stockpiled materials will be fenced, and the construction footprint area will be minimized to prevent the construction zone from extending beyond that which is necessary.	**All GO Stations** Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified zones. Monitoring will continue throughout the construction phase until activities are complete and all exposed soils have been stabilized and all construction waste has been cleaned up.
	All GO Stations Longer-term visual effects resulting from the removal of trees that currently provide a visual buffer from the corridor. Tree removal may pose undesirable aesthetic effects on all land uses, including residences, businesses, institutions and parks. **Spadina-Front and Bloor-Lansdowne GO Stations** Views of GO Station buildings and other components from the streets and buildings may change the viewscapes for nearby residents and visitors to the area.	**All GO Stations** Metrolinx is establishing a Vegetation Compensation Protocol for RER Projects. Vegetation that is removed will be compensated for in accordance with this Protocol, as documented in the TIPs (BRCE EPR Addendum, Volume 2 through Volume 6, Appendix C). Where appropriate, Metrolinx will seek to develop an aesthetically pleasing design for public-facing infrastructure in consultation with the municipalities adjacent landowners.	**All GO Stations** Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction work zones. Monitoring will continue throughout the construction phase until activities are complete and all exposed soils have been stabilized and all construction waste has been cleaned up. Metrolinx will monitor success and tend to new plantings in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects. Metrolinx to continue consultation with the City of Vaughan and adjacent land owners during construction.
Socio-Economic Policies and Planning Context	**Spadina-Front GO Station** • No zoning conflicts anticipated for the City of Toronto Zoning By-Law 569-2013 and the Former City of Toronto Zoning By-Law 438. • City of Toronto OP – The GO Station is in accordance with planned land uses and urban structure designations in the Spadina-Front GO Station footprint. • Toronto Region Conservation Authority (TRCA) – There is no watercourse in the Spadina-Front study areas, nor are the areas located within the regulation limits of the TRCA. **Bloor-Landsowne GO Station** • According to the City of Toronto Zoning By-Law 569-2013 and the Former City of Toronto Zoning By-Law 438-86, lands	**All GO Stations** Metrolinx, as a Provincial Crown Agency, is not generally subject to municipal permitting and approval requirements; regardless, Metrolinx works in co-operation with local municipalities to adhere to the intent of the relevant permit/approval requirements to the extent possible.	**All GO Stations** Metrolinx will work collaboratively with the municipalities and conservation authorities to minimize effects on socio-economic features and existing land uses.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	within the Bloor-Lansdowne GO Station footprint are zoned as residential, open space, employment industrial, and commercial, which is not consistent with a proposed station. • City of Toronto OP – The GO Station is in accordance with planned land uses and urban structure designations in the Bloor-Lansdowne GO Station footprint. • Toronto Region Conservation Authority (TRCA) – There is no watercourse in the Bloor-Lansdowne study areas, nor are the areas located within the regulation limits of the TRCA. **Kirby GO Station** • Provincial Policy Statement (PPS) – Presence of one PSW (Don River West Branch Headwater Wetland Complex) and one woodland in the Kirby study area documented by the MNRF. Effects to KNHFs are documented in the NER (EPR Addendum, Volume 4, Appendix B). • The Greenbelt Plan area is outside of the Kirby GO Station footprint area therefore the Kirby GO Station is not required to follow the authority of the *Greenbelt Act*, 2017. • The ORMCP area is located outside of the Kirby GO Station footprint. As such, the Kirby GO Station is not required to follow the authority of the ORMCA, 2001. • According to the City of Vaughan Zoning By-law 1-88, lands at the Kirby GO Station footprint are zoned as agricultural, which is not consistent with a proposed station. • City of Vaughan Official Plan 2010 – The GO Station is in accordance with planned land uses in the Kirby GO Station footprint. • TRCA – The Kirby GO Station study area is mapped within the authority's regulated area. **Mulock GO Station** • According to the Town of Newmarket Zoning By-law 2010-40, part of the lands within the Mulock GO Station footprint are zoned as Regulated Area and Other Natural Hazards Zone and as Flood Plain, which is not consistent with a proposed station.		

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	• Town of Newmarket OP – The GO Station is in accordance with planned land uses in the Mulock GO Station footprint. • LSRCA – A portion of the GO Station footprint area is within the LSRCA regulated limit. • Temporary disruption to natural areas under the LSRCA jurisdiction, longer-term visual effects from construction – further details in the NER (EPR Addendum, Volume 5, Appendix B). **Innisfil GO Station** • According to the Town of Innisfil Comprehensive Zoning By-Law 080-13, lands in the Innisfil GO Station footprint are zoned as agricultural, open space, and residential rural, which is not consistent with a proposed station. • County of Simcoe OP – The GO Station is in accordance with public transit-supportive policies. In addition, the County OP (2016) also recognizes the importance of limiting incompatible development adjacent to rail facilities, such as the existing Barrie rail corridor and the proposed Innisfil GO Station. • Town of Innisfil OP – The GO Station is in accordance with planned land uses in the Innisfil GO Station footprint. • LSRCA/LSPP – The GO Station falls under the LSRCA jurisdiction but is not within the LSRCA regulated area. • Potential effects of the GO Station on the LSPP area and KNHF zones are discussed in the NER presented in Appendix B of Volume 6 of the BRCE EPR Addendum.		
Social-Economic and Land Use – Operations and Maintenance			
Existing Land Use, Community Services, Amenities and Resources	**All GO Stations** Property values tend to increase for properties located in close proximity to transit facilities as transit service increases, resulting in a positive effect. **Spadina-Front GO Station** New sidewalk infrastructure along the south side of Front Street and a future connection to Rail Deck Park. **Bloor-Lansdowne GO Station**	**All GO Stations** As there are no predicted effects during the operations and maintenance phase, no mitigation is required.	**All GO Stations** No monitoring activities are required.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	Future potential pedestrian link to the Lansdowne TTC Station, a future MUP providing connectivity to the WTRP, as well as a MUP bridge over Davenport Road to connect with the neighbourhoods to the north of Davenport Road.		
	All GO Stations Effects from increased noise, vibration, and dust (including diminished air quality conditions) on lands in close proximity to the GO Stations from GO Station operations are deemed to be insignificant. • Expected air quality effects to lands surrounding the GO Stations are documented in the AQIAs (EPR Addendum, Volume 2 through Volume 6, Appendix G). • Expected noise and vibration effects are documented in the NVIAs (EPR Addendum, Volume 2 through Volume 6, Appendix H).	**All GO Stations** Mitigation measures will be taken as documented in the NVIAs and AQIAs (EPR Addendum, Volume 2 through Volume 6, Appendix H and G respectively). Operations and maintenance will be carried out in accordance with applicable regulations and standards, including Ontario's AAQC (PIBS#6570e01) (MOE, 2016) Maintenance vehicles and equipment will be equipped with current emission controls and kept in a state of good repair.	**All GO Stations** Metrolinx will continue its ongoing inspection program to monitor the effectiveness of its GO Transit operations Existing complaints procedure is in place to address any concerns raised by neighbouring land owners, municipalities and/or the public.
	All GO Stations Traffic effects are documented in the TTIAs (EPR Addendum, Volume 2 through Volume 6, Appendix I). • Illegal parking at surrounding streets may result from insufficient parking spaces. • Congestion and increased vehicle volumes in the GO Station study areas may have a negative effect on pedestrian and cyclist comfort. • Pedestrian and cyclist trips are expected to have a minor effect on traffic operations in the GO Station study areas. **Spadina-Front, Bloor-Lansdowne, Kirby and Mulock GO Stations** • Opening of the GO Stations is expected to have a positive effect on pedestrians and cyclists by providing accessible public transit and encouraging active transportation.	**All GO Stations** Mitigation measures will be taken as documented in the TTIAs (EPR Addendum, Volume 2 through Volume 6, Appendix I).	**All GO Stations** Ridership, intersection operations, parking demand, and transit stops at the GO Stations will be monitored.
Existing Visual Characteristics	**All GO Stations** Existing visual characteristics will be modified with the presence of the GO Stations.	**All GO Stations** Where appropriate, Metrolinx will seek to develop an aesthetically pleasing design for public-facing infrastructure in consultation with municipalities and/or adjacent landowners. Light spillage will be taken into consideration in the design stage of the GO	**All GO Stations** Metrolinx will continue its ongoing inspection program to monitor the effectiveness of its GO Transit operations.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	Potential of light spillage due to the presence of the GO Stations, from lighting at the GO Station and in GO Station parking lots.	Station. Lighting will be minimized and controlled to prevent light spillage beyond the property line, as well as light pollution in the sky at night. Implement mitigation measures including but not limited to: external visors on floodlights; addition of light shields such as walls of hedges; various intensities and control of lighting; lighting to be designed as per the Metrolinx Design Requirements Manual (2016); and shielded fixtures in GO Station parking lots.	
	All GO Stations Crime prevention through environmental design (CPTED) may become more effective as a result of increased lighting and increased pedestrian and cycling movement near the GO Stations.	**All GO Stations** As there are no predicted effects during the operations and maintenance phase, no mitigation is required.	**All GO Stations** No monitoring activities are required.
Air Quality – Construction			
Lands Adjacent to GO Stations	**All GO Stations** Fugitive dust emissions (TSP), inhalable particulate matter PM_{10} and $PM_{2.5}$ resulting from: • Clearing and grubbing of the GO Station sites. • Soil excavation and filling activities required to facilitate the site layout for the GO Station. • Demolition of structures necessary to accommodate the GO Station. • Cutting of existing and new concrete. • Stockpiling of soil and other friable construction materials. • Granular (i.e., aggregate) material loading and unloading activities. • Transport of soils and other friable construction materials to/from the GO Stations site via dump trucks. • Movement of heavy and light vehicles on paved and unpaved roads. Emissions resulting from the use of combustion engines associated within mobile and stationary construction equipment and machinery on-site. In addition to the above, construction activities will result in temporary traffic disruption and detours, which can lead to increased traffic congestion, thereby increasing motor vehicle	**All GO Stations** Best Management Practices (BMP) will be implemented to mitigate potential air quality effects associated with the construction activities related to the GO Stations, including but not limited to the following: • Implementation of dust suppression measures (i.e., application of water wherever appropriate, or the use of approved non-chloride chemical dust suppressants, where the application of water is not suitable) as needed to control fugitive dust emissions in accordance with the publication “Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities” (Cheminfo Services Inc., 2005). • Stockpiling of soil and other friable materials in locations that are less exposed to wind (i.e., protected from the wind by suitable barriers or wind fences/screens) and far from sensitive receptors. • Seeding, paving, covering, wetting, or otherwise treating disturbed soil surfaces as soon as reasonably possible after disturbance. Permanently stabilizing exposed soil areas with non-erodible material (i.e., stone or vegetation) as soon as reasonably possible after construction in the affected area is complete. • Modifying work schedules when weather conditions could lead to adverse impacts (i.e., very dry soil and high winds). • Removing all loose or unsecured debris or materials from empty trucks prior to leaving the GO Station sites. • Covering all truckloads of dust-producing material, including use of dump trucks with retractable covers for the transport of soils and other friable materials. • Minimizing the number of loadings and unloading of friable materials.	**All GO Stations** Construction activities will be monitored by a qualified Environmental Inspector who will frequently review the effectiveness of the mitigation measures and construction BMPs to confirm they are functioning as intended. In the event that mitigation measures and/or construction BMPs are not functioning as intended (and are ineffective), the Contractor will be notified to implement revised mitigation measures/BMPs designed to improve their overall effectiveness. Dust levels will be monitored daily by the Contractor and frequently by the Environmental Inspector to assess the effectiveness of dust suppression measures, and adjust as required. Monitoring will continue throughout the construction phase until activities are complete, all exposed soils have been stabilized, and all construction waste has been cleaned up. A complaint response protocol for nuisance effects, such as dust, will also be established.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	exhaust emissions on nearby roadways, which could result in elevated localized pollutant levels (or concentrations). However, compared with emissions from other motor vehicle sources in the GO Station study areas, emissions from construction equipment and machinery are generally insignificant with respect to compliance with provincial and federal ambient air quality standards.	• Minimizing drop heights, using enclosed chutes, and covering debris bins used for deconstruction of affected structures. • Reducing unnecessary traffic and implementation of speed limits on any unpaved surfaces. • Vacuum sweeping or watering of all paved surfaces and roadways on which equipment and truck traffic enter and leave the construction areas. • Washing of equipment and machinery, and use of wheel washes or mud mats where practical at construction site exits to limit the migration of soil and dust off-site. • Ensuring that all construction vehicles, machinery, and equipment is equipped with current emission controls, which are in a state of good repair. • Minimizing dust-generating activities during windy conditions.	
Air Quality – Operations and Maintenance			
Lands Adjacent to GO Stations	**Spadina-Front and Bloor-Lansdowne GO Stations** No significant sources of air emissions during operation and maintenance. **Kirby, Mulock and Innisfil GO Stations** Major source of air emissions will be generated by the combustion engines of passenger vehicles in the parking lot and the PPUDO area and/or from the buses travelling in the bus loop. Fugitive dust emissions may also be generated from vehicles travelling on the paved surfaces and adjacent driveways. The potential effect on local air quality during the operations and maintenance phase is predicted to be negligible for most of the contaminants.	**All GO Stations** Operations and maintenance of the GO Stations will be carried out in accordance with applicable regulations and standards, including Ontario's AAQC (PIBS#6570e01) (MOE, 2016). **Kirby, Mulock and Innisfil GO Stations** To improve general air quality around the GO Station during the operations and maintenance phase, the following measures are recommended but not limited to: • Erecting signs that encourage people to turn off their vehicles instead of idling for long periods of time. • Implementing MUP connections to increase the number of passengers that are walking or cycling to access the GO Stations. • Designating parking spots that are only available for carpoolers. Dust emissions from the roads will be minimized by cleaning the roadways and parking lots.	**All GO Stations** Metrolinx has ongoing inspection schedules to monitor the effectiveness of its GO Transit operations. A complaints procedure is in place to address any concerns raised by neighboring land owners, municipalities or the public.
Noise and Vibration – Construction			
Lands Adjacent to the GO Stations (Noise)	**All GO Stations** Potential effects are generally limited to the lands adjacent to the GO Stations, and may be perceived as a short-term nuisance to affected building occupants due to: • Soil excavation, grading, compaction. • Vehicle movement, heavy lifting.	**All GO Stations** Construction BMPs will be utilized to minimize any adverse effects from construction noise at nearby sensitive receptors. Prior to construction, a Noise and Vibration Control Plan shall be developed and implemented to reduce the noise impacts at sensitive receptors. According to municipal by-laws, construction activities carried out under the direction of Provincial Agencies such as Metrolinx are not restricted to the Noise By-law hours as noted below:	**All GO Stations** Construction activities will be monitored by a qualified Environmental Inspector who will frequently check the effectiveness of the mitigation measures and the execution of construction BMPs. Should the Environmental Inspector confirm the prescribed mitigation measures and/or BMPs are not functioning as planned, revised mitigation measures and/or BMPs designed to improve effectiveness will be

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	• Existing track modifications and demolition.	• Spadina-Front and Bloor-Lansdowne GO Stations: According to clause 2.1C of City of Toronto Municipal Code Chapter 591, construction work for “major transit projects” are not restricted to the Noise By-law hours. • Kirby GO Station: According to the City of Vaughan By-Law 96-2006 construction activities carried out under the direction of Provincial Agencies such as Metrolinx are not restricted to the Noise By-law hours. • Mulock GO Station: According to the Town of Newmarket Noise By-law No. 2004-94 activities carried out under the direction of Provincial Agencies such as Metrolinx are not restricted to the Noise By-law hours. • Innisfil GO Station: According to the Town of Innisfil Noise By-law No. 122-16 Commercial Construction activities carried out under the direction of Provincial Agencies such as Metrolinx are not restricted to the Noise By-law hours. However, Metrolinx has committed to taking the following noise mitigation measures: • Whenever possible, road construction activities will occur during the day instead of at night. • If construction needs to be undertaken outside of the normal daytime hours, local residents and municipalities will be informed beforehand of the type of construction planned and the expected duration. • Construction equipment will meet the noise level specifications in MOECC guidelines NPC-115 and NPC-118. • Noise control measures are being implemented, e.g.: ◆ Implement noise compliance checks to ensure equipment levels are in compliance with MOECC guidelines NPC-115 and NPC-118. ◆ Keep equipment well-maintained and fitted with efficient muffling devices. ◆ Restrict idling of equipment to the minimum necessary to perform the specified work. ◆ Avoid unnecessary revving of engines and switch off equipment when not required (do not idle). ◆ Coordinate ‘noisy’ operations such that they will not occur simultaneously, where possible. ◆ Use rubber linings in chutes and dumpers to reduce impact noise, where possible. ◆ Minimize drop heights of materials.	implemented. The revised measures shall be reinstated as required in a timely manner. A complaints protocol will be prepared and implemented for receiving, investigating and addressing construction noise complaints from the public during construction of the GO Stations. The protocol will include a plan for how the public is to be notified of their options for lodging a complaint. Monitoring equipment will be installed, as required, to measure and document noise levels at various points to provide empirical data for the assessment of complaints.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		Route haulage/dump trucks on main road where possible, rather than quieter residential roads. • Use of deconstruction procedures in lieu of demolition of affected existing structures wherever feasible. • Operation of equipment with correctly installed and maintained sound attenuating devices (i.e., mufflers). • Use of broadband back-up alarms on mobile equipment. • Use of saws to break up existing asphalt and concrete instead of hydraulic hammers or jack hammers, wherever possible and practical. • Wherever feasible, design suitable foundations for infrastructure that minimizes the need or extent of pile driving. Wherever pile driving is necessary, use methods that minimize noise (i.e., pre-drilling, switching impact with vibratory hammer, using augured cast-in-place piles, drilled shafts, enclosures, etc.). • Scheduling activities that are expected to be particularly noisy during the day. Best efforts will be made to minimize impacts on neighbourhoods by limiting nighttime noisy activities. Notification of nighttime construction will be provided in advance. In addition to the above measures, Metrolinx will develop a monitoring/verification plan to demonstrate that the mitigation measures above are appropriate, functioning correctly, and that acceptable noise levels at sensitive receivers are maintained for the duration of construction. Note that Ministry of Labour (MOL) requirements and OHSA and Regulations (Reg. 213/91-105) (Government of Ontario, 2018) specify obligations for dump trucks to be equipped with automatic audible reversal alarms when operated in reverse. During construction work if it is determined that there is a need to further reduce noise effects, additional mitigation measures may be considered and implemented, where appropriate.	
Lands Adjacent to the GO Stations (Vibration)	**All GO Stations** Nuisance to adjacent building occupants resulting from construction activities causing vibrations, typically involving: • Soil excavation, grading, compaction; • Vehicle movements, heavy lifting; and • Existing track modifications and demolition Potential damage to adjacent property or infrastructure.	**All GO Stations** Construction BMPs will be utilized to minimize any adverse effects from construction vibration at nearby sensitive receptors. Prior to construction, a Noise and Vibration Control Plan shall be developed and implemented to reduce the vibration impacts at sensitive receptors. The plan will include the following details for vibration: • Whenever possible, road construction activities will occur during the day instead of at night;	**All GO Stations** Construction activities will be monitored by a qualified Environmental Inspector who will frequently check the effectiveness of the mitigation measures and the execution of the Noise and Vibration Control Plan. Should the Environmental Inspector confirm the prescribed mitigation measures and/or BMPs in the plan are not functioning as planned, revised mitigation measures and/or BMPs designed to improve effectiveness of the plan will be implemented. The revised measures shall be reinstated as required in a timely manner.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		• If construction needs to be undertaken outside of the normal daytime hours, local residents and municipalities will be informed beforehand of the type of construction planned and the expected duration; • Vibration control measures are being implemented, i.e.: ◆ Use of construction methods which may minimize vibration, where possible; and ◆ Use of lower vibration-generating equipment where practical. In addition to the above measures, Metrolinx will develop a monitoring/verification plan to demonstrate that the mitigation measures above are appropriate, functioning correctly, and that acceptable vibration levels at sensitive receivers are maintained for the duration of construction. Blasting operations are generally prohibited. If blasting is unavoidable the Contractor must obtain approval from the affected municipalities and undertake a detailed impact assessment and implement appropriate mitigation measures to ensure compliance with local by-laws and MOECC guidelines, including NPC-119 Blasting, included in the Model Municipal Noise Control By-law (Ontario Ministry of the Environment, 2008). No specific construction vibration mitigation measures are anticipated to be required to address potential building damage, assuming there will be no impact or vibratory pile driving, and vibratory rollers will be set back at least eight metres from existing structures and buildings. During construction work if it is determined that there is a need to further reduce vibration effects, additional mitigation measures may be considered and implemented.	Should the Contractor or Environmental Inspector notice or be made aware of property or infrastructure damage due to construction vibration, work in the area will stop immediately. At this time, a restoration plan will be developed in consultation with the property or infrastructure owner, and the work will be completed using alternative methods to prevent further damage. Monitoring equipment will be installed, as required, to measure and document vibration levels at various points to provide empirical data for the assessment of complaints. Monitoring equipment shall be capable of alarming the contractor when prohibited limits.
Noise and Vibration – Stationary Noise			
Lands Adjacent to the GO Station	**All GO Stations** Causes of potential noise effects can include: • Station public address system. • Ancillary systems.	**All GO Stations** During detailed design, the GO Stations public address system, ancillary systems, and any other stationary noise sources shall be designed so that the one-hour equivalent sound level does not exceed the higher of the applicable exclusion limit value given in NPC-300, or the background sound level.	**All GO Stations** A complaints procedure is in place to address any concerns raised by neighbouring land owners, the municipalities, or the public.
Noise and Vibration – Operations and Maintenance			
Lands Adjacent to the GO Station (Noise)	**Spadina-Front GO Station** Significant noise sources are: diesel operated bidirectional rail services along Lakeshore West, Milton Kitchener and Barrie rail corridors (GO, Union Pearson Express and VIA Rail); and automobile traffic along Bathurst Street, Fort York Boulevard, Front Street West and Spadina Avenue; traffic noise, bus idling and bus pass-bys; and noise due to train bells and braking.	**All GO Stations** Noise mitigation measures are not deemed to be necessary during the operations and maintenance phase.	**All GO Stations** Metrolinx and GO Transit have ongoing inspection programs to monitor and upkeep its equipment and infrastructure. Maintaining good working order of its property is anticipated to reduce incidents of community exposure to excessive noise emissions. A complaints procedure is in place to address any concerns raised by neighbouring land owners, the affected municipalities, or the public.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	Bloor-Lansdowne GO Station Significant noise sources are: diesel operated passenger rail service along the Barrie rail corridor; diesel operated freight rail service along the CP rail corridor; traffic volumes along Bloor Street West, Dundas Street West, Lansdowne Avenue and Symington Avenue; and incoming train bells and whistles. **Kirby GO Station** Significant noise sources are: diesel operated rail service along the Barrie rail corridor; traffic volumes along Keele Street and Kirby Road; road crossing signals; incoming train bells and whistles; idling buses; and parking lot noise; **Mulock GO Station** Significant noise sources are: diesel operated rail service along the Barrie rail corridor; traffic volumes along Mulock Drive and Bayview Avenue; road crossing signals; incoming train bells and whistles, idling buses; and parking lot noise; and **Innisfil GO Station** Significant noise sources are: diesel operated rail service along the Barrie rail corridor; traffic volumes along 6th Line and 20 Sideroad; ongoing construction associated with the new Sleeping Lion residential development located east of the proposed Innisfil GO Station; incoming train bells and whistles; idling buses; and parking lot noise.		
Lands Adjacent to the GO Station (Vibration)	**Spadina-Front GO Station** Significant vibration sources are: diesel operated bidirectional passenger rail services along the Lakeshore West, Milton, Kitchener and Barrie rail corridors; freight trains; and automobile traffic along adjacent local streets. **Bloor-Lansdowne GO Station** Significant vibration sources are: diesel operated passenger rail service along the Barrie rail corridor; diesel operated passenger rail service along the Kitchener rail corridor; diesel operated service along the Milton rail corridor; traffic volumes along Bloor Street West, Dundas Street West, Lansdowne Avenue and Symington Avenue.	**All GO Stations** Vibration mitigation measures are not deemed to be necessary during the operations and maintenance phase.	**All GO Stations** Metrolinx and GO Transit have ongoing inspection programs to monitor and upkeep its equipment and infrastructure. Maintaining good working order of its property is anticipated to reduce incidents of community exposure to excessive vibration emissions. A complaints procedure is in place to address any concerns raised by neighbouring and owners, the affected municipalities, or the public.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	Kirby GO Station Significant vibration sources are: diesel operated rail services along the Barrie rail corridor; traffic volumes along Keele Street and Kirby Road; and crossovers and switches. **Mulock GO Station** Significant vibration sources are: diesel operated rail services along the Barrie rail corridor; traffic volumes along Mulock Drive and Bayview Avenue; and crossovers and switches. **Innisfil GO Station** Significant vibration sources are: diesel operated rail services along the Barrie rail corridor; ongoing construction associated with the new Sleeping Lion residential development located east of the GO Station; and crossovers and switches.		
Traffic and Transportation Infrastructure – Construction			

Automobile Traffic	**Spadina-Front GO Station**
	
	Road closure or reduced lanes during construction will temporarily impede traffic flow in the vicinity of the GO Station.
	
	Bloor-Lansdowne GO Station
	
	Delays at all intersections along the detour route resulting from additional detoured traffic volumes.
	
	Critical movements for some intersections along the detour route are expected to operate above capacity.
	
	Kirby GO Station
	
	Potential effects to traffic operations at intersections along the detour route resulting from additional detoured traffic volumes.
	
	Mulock GO Station
	
	A haul route for construction vehicles is identified along Mulock Drive; however, construction vehicle volumes are minimal relative to anticipated background traffic volumes, and unlikely to create potential effects to traffic operations at intersections along the haul route.
	
	Potential effects to traffic operations at intersections along the detour route resulting from additional detoured traffic volumes.
		Metrolinx will share recommendations regarding automobile traffic with appropriate municipalities and transit authorities.
		
		Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations
		
		• Development of a CTMP, which will include:
		  ◆ Provision of advance notice of construction to travellers and emergency service providers in the GO Station study areas prior to commencement of work.
		  ◆ Variable message signs to provide additional route options for road users to minimize delays throughout the network.
		  ◆ Coordination with emergency service providers to identify potential safety issues associated with construction prior to commencement of work.
		
		Spadina-Front GO Station
		
		• Develop a traffic management plan to minimize traffic delays during construction.
		
		Bloor-Lansdowne GO Station
		
		  ◆ Adjustment of signal timings that may help reduce delays at critical movements.
		
		Kirby GO Station
		
		• Coordination with emergency service providers to identify potential safety issues associated with construction prior to commencement of work.
			All GO Stations
			
			Construction progress should be monitored closely and travellers in the GO Station study areas should be notified of any delays in construction prolonging necessitation of detour route.
			
			Traffic volumes should be monitored prior to and during construction to ensure that enacted mitigation measures are appropriate for the traffic demand in the GO Station study areas.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	Innisfil GO Station 6th Line is identified as the proposed haul route, but volumes of construction vehicles will be minimal relative to anticipated background traffic on the corridor, thus delays to traffic operations are not anticipated within the Innisfil study area. Vehicle traffic may be obstructed while work is being undertaken adjacent to or within the 6th Line ROW.	**Mulock GO Station** • Adjustment of signal timings to better accommodate increased flow of traffic along the designated detour route during construction. **Innisfil GO Station** • Undertaking work within the ROW in stages and shifting the alignment of the lanes slightly north or south to accommodate work on the south or north side of 6th Line, respectively can enable 6th Line to maintain one lane of travel in each direction.	
Pedestrians and Cyclists	**Spadina-Front GO Station** Not included as part of the Transportation Brief. **Bloor-Lansdowne GO Station** Pedestrians and cyclists may be negatively impacted by the closure of Bloor Street West or Davenport Road as they may be required to detour over 400 metres away to cross the rail corridor on alternate routes. **Kirby GO Station** Cyclists may be negatively impacted by the closure of Kirby Road as they may be required to detour up to two km to King Vaughan Road or Teston Road to cross the rail corridor. Pedestrians will not be impacted by construction as there are no existing sidewalks on this part of Kirby Road. **Mulock GO Station** Pedestrians and cyclists may be negatively impacted by the closure of Mulock Drive as they may be required to detour up to one km north to Eagle Street to cross the Barrie rail corridor. **Innisfil GO Station** Due to low pedestrian and cyclist volumes and an absence of active transportation facilities on 6th Line near the proposed Innisfil GO Station, no potential effects to pedestrian and cyclist travel are anticipated during the construction period.	**Spadina-Front GO Station** Not included as part of the Transportation Brief. **Bloor-Lansdowne, Kirby, Mulock and Innisfil GO Stations** A CTMP will be developed as a mitigation measure for the construction phase of the GO Stations. This will include best practices for ensuring that pedestrian and cyclist access through the work zone is maintained in order to minimize lengthy detours, and that proper signage is implemented to alert pedestrians and cyclists of detours.	**All GO Stations** Pedestrian and cyclist access areas in work zone should be monitored to ensure they remain clear of obstructions and barriers to accessibility. Construction progress should be monitored closely, and travellers in the GO Station study areas should be notified of any changes in construction schedule.
Transit	**Spadina-Front GO Station** Not included as part of the Transportation Brief. **Bloor-Lansdowne GO Station**	**Spadina-Front GO Station** Not included as part of the Transportation Brief. **Bloor-Lansdowne GO Station**	**All GO Stations** Construction progress should be monitored closely, and travellers in the GO Station study areas should be notified of any delays in construction prolonging necessitation of detour routes.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	• TTC 127 Davenport bus route will have to be detoured, which will require the removal of transit service from some stops on Davenport Road. • TTC 26 Dupont and 47 Lansdowne bus routes may face delays from detoured traffic. **Kirby GO Station** Minimal delays are expected to the YRT 22 King City bus route because of increased traffic volumes along the designated detour routes. **Mulock GO Station** York Region Transit (YRT) 57/57A Mulock Bus route may need to be detoured, which may require the removal of transit service from some stops on Mulock Drive and may lengthen travel time. York Region Transit (YRT) 56 Gorham Eagle bus route may face nighttime delays from detoured traffic. **Innisfil GO Station** No effect to microtransit operations is expected. Transit stops near the work zone may need to be relocated or temporary removed if obstructed by construction activities.	Development of a CTMP, which will include: • Alerting TTC of potential travel delays and service disruptions in advance of Bloor-Lansdowne GO Station construction including road closures. • Identification the best detour routes for transit vehicles that minimizes travel time and service disruptions should be identified. **Kirby GO Station** Development of a CTMP, which will include: • Notification to transit agencies operating in the Kirby study area well in advance of Kirby GO Station construction or road closures. • Notification to customers to potential travel delays and service disruptions in advance of Kirby GO Station construction including road closures. **Mulock GO Station** Development of a CTMP, which will include: • Notification to YRT well in advance of Mulock GO Station construction or road closures. • Identification of the best detour routes for transit vehicles to minimize travel time and service disruptions. • Notification to customers of potential travel delays and service disruptions in advance of Mulock GO Station construction including road closures. **Innisfil GO Station** Development of a CTMP, which will include: • Notification to microtransit drivers and transit agencies operating in the Innisfil study area well in advance of Innisfil GO Station construction or road closures. • Identification of the best detour routes for transit vehicles that minimize travel time and service disruptions. • Notification of customers to potential travel delays and service disruptions in advance of Innisfil GO Station construction including road closures.	
Traffic and Transportation Infrastructure – Operations and Maintenance			
Automobile	**Spadina-Front GO Station** Not included as part of the Transportation Brief. **Bloor-Lansdowne GO Station**	Metrolinx will share recommendations relating to automobile traffic with the appropriate municipalities and transit authorities. **Spadina-Front GO Station** Not included as part of the Transportation Brief.	**All GO Stations** Metrolinx will share recommendations with the applicable municipalities regarding the monitoring of: • Ridership at the GO Stations; and

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	Potential effects to traffic operations as a result of additional site-generated traffic may be experienced at some intersections in the opening year (2025) and the 5-year horizon (2030). **Kirby GO Station** Potential effects to traffic operations caused by site-generated traffic may be incurred by additional site-generated traffic in the Kirby study area. **Mulock GO Station** Potential effects to traffic operations caused by site-generated traffic may be incurred by additional site-generated traffic in the Mulock study area. **Innisfil GO Station** Potential effects to traffic operations caused by site-generated traffic may be incurred by additional site-generated traffic in the Innisfil study area.	**Bloor-Lansdowne GO Station** Signal timing changes to reflect additional site-generated volumes will help improve intersection operations in the opening year and 5-year horizon (2030). Adjustment of signal timings that may help reduce delays at critical movements. **Kirby GO Station** Adjustment of signal timing changes to accommodate additional traffic generated by the GO Station, in order to reduce delays at some signalized intersections in the Kirby study area. **Mulock GO Station** Adjustment of signal timing changes to accommodate additional traffic generated by the GO Station, in order to reduce delays at some signalized intersections in the Mulock study area **Innisfil GO Station** • Adjustment of signal timing changes to accommodate additional traffic generated by the GO Station, in order to reduce delays at some signalized intersections in the Innisfil study area. • Conversion of some two-way stop controlled intersections to four-way stops to better serve altered traffic patterns and reduce delays after the opening of Innisfil GO Station.	• Intersection operations and traffic volumes in the GO Station study areas.
Site circulation	**Spadina-Front GO Station** Not included as part of the Transportation Brief. **Bloor-Lansdowne GO Station** No expected queuing issues in the opening year (2025) or the 5-year horizon (2030). No expected issues with emergency access to the GO Station site. **Kirby GO Station** Potential issues exist for maintenance vehicles blocking or being blocked by traffic to and from the parking lot. Emergency service vehicles (i.e., Fire, Police and Ambulance) will have multiple accesses to Kirby GO Station in case one of the accesses is obstructed during an emergency. **Mulock GO Station**	**Spadina-Front GO Station** Not included as part of the Transportation Brief. **Bloor-Lansdowne GO Station** Mitigation measures not required to address potential site circulation impacts. **Kirby, Mulock and Innisfil GO Stations** Maintenance activities should be limited to outside the A.M. and P.M. peak hours to minimize risk of obstructing traffic to and from the parking lot.	**All GO Stations** Metrolinx will share recommendations contained in this EPR Addendum with the applicable municipalities regarding the monitoring of: • Ridership at the GO Stations. • Monitoring for excessive queuing at parking lot exits or confusion due to parking lot layout.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
	Potential issues exist for maintenance vehicles blocking or being blocked by traffic to and from the parking lot. Emergency service vehicles (i.e., Fire, Police and Ambulance) will have multiple accesses to Mulock GO Station in case one of the accesses is obstructed during an emergency. **Innisfil GO Station** Maintenance vehicles may obstruct access and egress of vehicles during A.M. and P.M. peak hours. Emergency service vehicles (i.e., Fire, Police and Ambulance) may experience issues accessing the north parking lot if existing exit is obstructed		
Parking	**Spadina-Front GO Station** Not included as part of the Transportation Brief. **Bloor-Lansdowne GO Station** Travellers at Bloor-Lansdowne GO Station may choose to occupy existing street parking spaces illegally, potentially reducing parking supply for existing businesses and residents. **Kirby GO Station** Parking spaces at Kirby GO Station are expected to be sufficient in the opening year and in the 5-year horizon. Parking demand may exceed parking supply in the 10-year horizon (2035). **Mulock GO Station** Parking demand is not expected to exceed parking supply in the opening year (2025). Parking demand may exceed parking supply in the 5-year horizon (2030). **Innisfil GO Station** Parking demand is not expected to exceed parking supply in the opening year (2025) or 5-year horizon (2030). Parking demand may exceed parking supply in the 10-year horizon (2035).	**Spadina-Front GO Station** Not included as part of the Transportation Brief. **Bloor-Lansdowne GO Station** Metrolinx will share recommendations with the City of Toronto regarding: • Enhancement of existing parking enforcement strategies. • Enhancement of TDM strategies should the demand of parking supply exceed availability. **Kirby GO Station** Metrolinx will share recommendations with City of Vaughan/York Region regarding: • Consideration of the enactment of TDM strategies, should the demand of parking supply exceed availability. **Mulock GO Station** Metrolinx will share recommendations with the Town of Newmarket/York Region regarding: • Consideration of the enactment of TDM strategies, should the demand of parking supply exceed availability. **Innisfil GO Station** Metrolinx will share recommendations with the Town of Innisfil/Simcoe County regarding: • Consideration of the enactment of TDM strategies, should the demand of parking supply exceed availability.	**All GO Stations** Metrolinx will share recommendations with the applicable municipalities regarding the monitoring of: • Ridership and parking demand at the GO Stations.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
Pedestrians and Cyclists	**All GO Stations** Opening of the GO Stations is expected to have a positive effect on pedestrians and cyclists. Congestion and increased vehicle volumes in the GO Station study areas may have a negative effect on pedestrian and cyclist comfort. Increase in pedestrian volumes may cause crowding at the waiting areas of some crosswalks at intersections in the immediate vicinity of the GO Stations. Pedestrian and cyclist trips are expected to have a minor effect on traffic operations in the GO Station study areas. **Spadina-Front GO Station** Increased pedestrian flow along sidewalk adjacent to the GO Station and at key intersections. **Bloor-Lansdowne GO Station** Pedestrian and cyclist bridge over Davenport Road may affect traffic operations and sightlines to existing adjacent traffic signals on Davenport Road.	**All GO Stations** Metrolinx will share recommendations with the applicable municipalities regarding: • Consideration of clear, visible signage, good street illumination, and/or road markings at designated pedestrian crossings and designated bicycle routes. • Consideration of increasing the size of pedestrian waiting areas at crosswalks at intersections in the immediate vicinity of the GO Stations. • Undertaking efforts to fully integrate the GO Stations with existing pedestrian and cycling infrastructure. • Winter maintenance at the multiuse trails in the vicinity of the GO Station to maintain active transportation access to the GO Station at all times of year. **Spadina-Front GO Station** • Provide a tunnel connection between the main GO Station access location and the north side of Front Street West just west of Spadina Avenue as part of the PATH/The Well development. • Implement a crosswalk on the south leg of the Front/Spadina intersection. Depending on traffic implications this crossing may be implemented in the form of overpass or tunnel. • Signalization of the new pedestrian crosswalk at the west GO Station access location to accommodate pedestrians/ cyclists and ensure safety for all road users. • Widening of the west crosswalk at the intersection of Spadina Avenue and Front Street West. • Implementation of improved pedestrian crossing and pavement markings on the north crosswalk at the intersection of Front Street West and Draper Street. • Extension of the improved sidewalk along the south side of Front Street West westerly to Bathurst Street. **Bloor-Lansdowne GO Station** • Due to the complex proposed layout of the Bloor-Lansdowne GO Station integrated with the existing GS, new connection to Lansdowne TTC Station, and multiple points of pedestrian/cyclist access to the GO Station, as well as proper signage and wayfinding is critical for this GO Station. • After GO Station opening, implementation of active transportation-supportive infrastructure and connections will be helpful in reducing pedestrian and cyclist discomfort stemming from increased traffic volumes in the Bloor-Lansdowne study area.	**All GO Stations** Metrolinx will share recommendations with the applicable municipalities regarding the monitoring of: • Ridership at the GO Stations. • Crowding at the intersections in the immediate vicinity of the GO Stations.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		• The potential impacts of the pedestrian and cyclist bridge over Davenport Road on the traffic signals operations, and potential vehicle sightline obstructions in the Bloor-Lansdowne study area will be addressed during the detailed design stage. • The bridge will be designed such that its structure will minimize its impact on sightlines to existing traffic signals, enabling drivers to come to a safe stop at intersections. **Kirby GO Station** • Active transportation connections on Keele Street and Kirby Road to Kirby GO Station should be considered. Expansion of existing bicycle facilities on Keele Street, and construction on dedicated bicycle facilities on Kirby Street should also be undertaken. • Implementation of the envisioned improvements to the cycling infrastructure network as detailed in the York Region TMP will also ensure positive net effects of Kirby GO Station on cyclist ridership within the Kirby study area (York Region, 2016a). • Signalization of Access 3 by 2030, as discussed in the Kirby GO Station TTIA in Appendix I of Volume 4 of this EPR Addendum, can also help to relieve pedestrian discomfort while crossing Keele Street, by providing more routing options for pedestrians when travelling between the existing residential area east of Keele Street, and Kirby GO Station. Signalization of Access 3 could decrease travel distance for pedestrians using that access (relative to crossing at the existing intersections at Keele Street and Kirby Road, or at Keele Street and Peak Point Boulevard; **Mulock GO Station** • Consideration should be given to the connections to Audrie Sanderson Park south of the Mulock GO Station. The existing Tom Taylor/Nokiidaa Trail should be enhanced as it provides the closest pedestrian crossing west of the GO Station. Winter maintenance on the crossing should be given the same priority as surrounding sidewalks. Additional lighting at the existing Trail under Mulock Drive and signage indicating the presence of the crossing should be provided. • Implementation of the envisioned improvements to the cycling infrastructure network as detailed in the York Region TMP (York Region, 2016a) will also ensure positive net effects of the Mulock GO Station on cyclist ridership within the Mulock study area. These improvements include providing connections between the GO Station and the Tom Taylor/Nokiidaa Trail, coupled with Dennis Park, Stonehaven Avenue, and William Roe Boulevard.	

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		Innisfil GO Station • Implementation of the envisioned improvements to the cycling infrastructure network as detailed in the Town of Innisfil TMP and the Town of Innisfil Trails Master Plan will also ensure positive net effects of the Innisfil GO Station on cyclist ridership within the Innisfil study area. These improvements include providing connections between the GO Station and the future sidewalk and multi-use trail on 6th Line.	
Transit	**Spadina-Front GO Station** Not included as part of the Transportation Brief. **Bloor-Lansdowne GO Station** • Delay to transit vehicles attempting to access Lansdowne TTC Station may be experienced in the opening year (2025) and 5-year horizon (2030). • Additional local transit trips may create crowding issues on buses, trains, and platforms at Lansdowne TTC Station. **Kirby GO Station** Delay to transit vehicles attempting to access Kirby GO Station may be experienced. Additional local transit trips may create crowding issues on buses and bus shelters. **Mulock GO Station** Some delay to transit vehicles may be experienced near the Mulock GO Station in the opening year (2025) and 5-year horizon (2030). Additional local transit trips may create crowding issues on buses and bus shelters. **Innisfil GO Station** Existing microtransit services may experience a shortfall of available drivers. Microtransit trips originating from Innisfil GO Station may cause crowding in the PPUDO area. Additional local transit trips may create crowding issues on future bus routes.	**Spadina-Front GO Station** Not included as part of the Transportation Brief. **Bloor-Lansdowne GO Station** Metrolinx will share recommendations with the TTC regarding: • Transit pre-emption technology at traffic signals may reduce delay on transit routes. • Infrequent local transit services should be scheduled to align with scheduled GO train arrivals at the Bloor-Lansdowne GO Station. Signage at Lansdowne TTC Station should be provided to reflect additional connections to the Bloor-Lansdowne GO Station. **Kirby GO Station** Metrolinx will share recommendations with the YRT/City of Vaughan/York Region regarding: • Techniques to reduce the travel times of transit vehicles at these locations, such as transit pre-emption technology at traffic signals or high-occupancy vehicle lanes; • Scheduling infrequent local transit services to align with scheduled GO train arrivals at the Kirby GO Station to minimize passenger wait times; and • Effectively facilitating transfers between the Kirby GO Station and local transit routes and aligning the schedules of infrequent local transit routes to GO train arrival times. **Mulock GO Station** Metrolinx will share recommendations with the YRT/Town of Newmarket/York Region regarding: • Techniques to reduce the travel times of transit vehicles at these locations, such as transit pre-emption technology at traffic signals or high-occupancy vehicle lanes; • Scheduling infrequent local transit services to align with scheduled GO train arrivals at the Mulock GO Station to minimize passenger wait times; and	**Spadina-Front GO Station** Not included as part of the Transportation Brief. **Bloor-Lansdowne GO Station** Metrolinx will share recommendations with the TTC regarding monitoring of: • Ridership on local transit routes in the Bloor-Lansdowne study area and at the Bloor-Lansdowne GO Station should be monitored by the relevant planning and policy departments of the authorities having jurisdiction. • Transit time along routes interfacing with the GO Station should be monitored. • Waiting areas at Lansdowne TTC Station should be monitored for crowding. **Kirby GO Station** Metrolinx will share recommendations with the City of Vaughan/York Region regarding the monitoring of: • Ridership on local transit in the Kirby study area and at the Kirby GO Station. • Transit time along routes interfacing with the GO Station. • Crowding at local transit stop in the immediate vicinity of the GO Station. **Mulock GO Station** Metrolinx will share recommendations with the Town of Newmarket/York Region regarding the monitoring of: • Ridership on local transit in the Mulock study area and at the Mulock GO Station. • Transit time along routes interfacing with the GO Station.

Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Monitoring Activity
		• Effectively facilitating transfers between the Mulock GO Station and local transit routes and aligning the schedules of infrequent local transit routes to GO train arrival times. **Innisfil GO Station** Metrolinx will share recommendations with the Town of Innisfil/Simcoe County regarding: • Provision of a monetary sign-up bonus for microtransit drivers to increase supply of vehicles. • Reduction of microtransit fare for riders at the Innisfil GO Station by designating Innisfil GO Station as a key destination to increase microtransit ridership. • Scheduling future local transit services, if infrequent, to align with scheduled GO train arrivals at the Innisfil GO Station. • Consider increasing number of designated PPUDO spaces for microtransit vehicles. • Limiting allowable dwell time in PPUDO area via provision of signage may reduce PPUDO occupancy and crowding.	• Crowding at local transit stop in the immediate vicinity of the GO Station. **Innisfil GO Station** • Metrolinx will share recommendations with the Town of Innisfil/Simcoe County regarding the monitoring of: • Ridership on local transit in the Innisfil study area and at the Innisfil GO Station. • Crowding at PPUDO area. • Transit time along future routes interfacing with the GO Station. • Microtransit supply and wait times for trips heading to and away from Innisfil GO Station.

4.5 Environmental Mitigation and Monitoring Plan

An Environmental Mitigation and Monitoring Plan (EMMP) will be developed prior to construction of the Project. The EMMP will provide direction such that the implementation of the Project does not result in negative impact on matters of provincial importance related to the natural environment, properties of cultural heritage value or cultural heritage environment, or on constitutionally protected Aboriginal or Treaty Rights, discussed further in Sections 4.5.1 and 4.5.2 of this EPR Addendum. The EMMP will outline the responsibilities for carrying out monitoring and reporting activities, including timing and frequency of monitoring activities, as well as the compliance process.

The EMMP will also include any other potential environmental impacts or approval requirements that arise prior to construction and through completion of additional environmental studies, as required, including those that are not related to a matter of provincial importance. The EMMP will include relevant mitigation measures and requirements for potential environmental impacts and will include a list of the required permits and approvals for the Project. The EMMP will be updated once the applicable permits and approvals are received for the Project, or the findings from the additional environmental studies are available.

The EMMP structures the future commitments as follows:

- Natural Environment:
  - Significant Wildlife and Terrestrial Environment;
  - Drainage and Aquatic Environment; and
  - Trees.
- Cultural Environment:
  - Archaeological Resources; and
  - Cultural Resources.
- Social and Built Environment:
  - Socio-Economic and Land Use Characteristics;
  - Air Quality, Noise, and Vibration; and
  - Traffic and Transportation Infrastructure.

4.5.1 Matters of Provincial Importance

As prescribed in O. Reg. 231/08, the MOECC can take action in relation to the TPAP if there is a potential for a negative impact on a matter of provincial importance that relates to the natural environment or has CHVI related to constitutionally protected Aboriginal or Treaty Rights. Table 4-16 provides a list of the matters that may be relevant in determining provincial importance (as per the Guide to Ontario's TPAP (MOE, 2014), the Project definition of these matters and an indication of their relevance to the Project when assessing potential effects of the Project on matters of provincial importance. As noted above, the EMMP will outline in more detail the specific matters of provincial importance as they relate to the Project and the

commitments made to confirm that the implementation of the Project does not result in negative impacts to matters of provincial importance.

4.5.2 Constitutionally Protected Aboriginal or Treaty Rights

As discussed in Section 5 of this EPR Addendum, Metrolinx has undertaken consultation with Indigenous communities that have expressed an interest in the Project.

Table 4-16: Matters of Provincial Importance

Matters of Provincial Importance[1]	Definition [2]	Applicability to the Project
A park, conservation reserve or protected area.	A provincial park, conservation reserve or provincially protected area designated by the province.	There are no provincial parks or conservation reserves within the GO Station study areas.
Extirpated, Endangered, Threatened, or species of special concern and their habitat.	• A SAR: Extirpated, Endangered, or Threatened species and their habitat. • A SCC: ◆ Rare or substantially declining species or have a high percentage of their global population in Ontario. ◆ Special concern species identified on the SARO List that were formally referred to as "vulnerable" in the SWH Technical Guide (SWHTG) (MNRF, 2000). ◆ Species identified as nationally Endangered or Threatened by the COSEWIC, which are not protected in regulation under Ontario's ESA.	There are number of potential impacts to SAR and SCC as a result of the removal of portions of land adjacent to the Barrie rail corridor that provide habitat for these species.
A wetland, woodland, habitat of wildlife or other natural heritage area.	• A Significant Wetland, Significant Woodland, Significant Valleyland or SWH as defined in Section 2.1.5 of the PPS (2014). • A Natural Area Abutting Lake Simcoe as defined in policy 6.21-DP of the LSPP.	The Kirby study area includes the Don River West Branch Headwater PSW complex There are portions of candidate SWH that will be removed as a part of construction of the Mulock GO Station.
An ANSI.	A Significant ANSI as defined in Section 2.1.5 of the PPS (2014).	There are no Significant ANSIs and no Candidate ANSIs within the GO Station study areas.
A stream, creek, river or lake containing fish and their habitats.	A stream, creek, river or lake containing fish and their habitats.	There is a one watercourse within the within the Mulock study area, which provides direct fish habitat. There is one permanent watercourse and two intermittent watercourses within the Kirby study area. Further aquatic habitat field investigations will be required to determine if the Project presents any potential impact to fish or fish habitat.
An area or region of surface water, groundwater or other important hydrological feature.	An area or region of surface water, groundwater or other important hydrological feature.	There is one WHPA present within the Mulock study area. Although there are no proposed activities related to the operation of the Mulock GO Station that would constitute drinking water threats. Thus, no negative effects are anticipated. Construction-related mitigation has been identified.
Protected heritage property.	Property designated under Parts IV, V or VI of the OHA; property subject to a heritage conservation easement under Parts II or IV of the OHA; property identified by the Province and prescribed public bodies as PHP under the Standards and Guidelines for Conservation of Provincial Heritage Properties; property protected under federal legislation, and United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites.	Two properties protected under Part IV, and two Heritage Conservation Districts protected under Part V of the OHA were identified within the GO Station study areas. Further study and construction-related mitigation have been identified.
Built heritage resources (BHR).	A building, structure, monument, installation or any manufactured remnant that contributes to a property's CHVI as identified by a community, including an Aboriginal community. Built heritage resources (BHRs) are generally located on property that has been designated under Parts IV or V of the OHA or included on local, provincial and/or federal registers.	In addition to the properties protected under Parts IV and V of the OHA, there are also six properties listed under municipal heritage registries and identified as Protected Heritage Properties. No properties are identified as a Protected Heritage Property of Provincial Significance.
Cultural heritage landscapes (CHL).	A defined geographical area that may have been modified by human activity and is identified as having CHVI by a community, including an Aboriginal community. The area may involve features such as structures, spaces, archaeological sites or natural elements that are valued together for	

Matters of Provincial Importance[1]	Definition [2]	Applicability to the Project
	their interrelationship, meaning or association. Examples may include, but are not limited to, heritage conservation districts designated under the OHA; villages, parks, gardens, battlefields, main streets and neighbourhoods, cemeteries, trail ways, viewsheds, natural areas and industrial complexes of heritage significance; and areas recognized by federal or international designation authorities (i.e., a National Historic Site or District designation, or a UNESCO World Heritage Site).	
Archaeological resources and areas of potential archaeological interest.	Includes artifacts, archaeological sites, marine archaeological sites, as defined under the OHA. The identification and evaluation of such resources are based upon archaeological fieldwork undertaken in accordance with the OHA. Methods to identify archaeological potential are established by the province, but municipal approaches which achieve the same objectives may also be used. The OHA requires archaeological potential to be confirmed through archaeological fieldwork.	There are areas with archaeological potential within the GO Station study areas. These are being further investigated through Stage 2 AAs.
An area designated as an escarpment natural area or an escarpment protection area by the Niagara Escarpment Plan under the *Niagara Escarpment Planning and Development Act.*	An area designated as an escarpment natural area or an escarpment protection area by the Niagara Escarpment Plan under the *Niagara Escarpment Planning and Development Act.*	The Project study area does not fall within the Niagara Escarpment Plan Area.
Property within an area designated as a natural core area or natural linkage area within the area to which the ORMCP under the ORMCA, 2001 applies.	Property within an area designated as a natural core area or natural linkage area within the area to which the ORMCP under the ORMCA applies.	No GO Stations are located in the ORMCP lands.
Property within an area described as a KNHF or a key hydrologic feature (KHF) in the Protected Countryside by the Greenbelt Plan under the *Greenbelt Act,* 2017.	Property within an area described as a KNHF or a KHF in the Protected Countryside by the Greenbelt Plan under the *Greenbelt Act*, 2017.	No GO Stations are located within the Greenbelt Area. Thus, no portions of land identified as KNHFs within the Greenbelt Area will be removed as a part of GO Stations development.

Note:

[1] Examples as listed in the Guide to Ontario's TPAP (MOE, 2014).

[2] Definitions are based on applicable regulations, agency consultations or the Guide to Ontario's TPAP (MOE, 2014).

5. Stakeholder Consultation Process

5.1 Overview of the Stakeholder Consultation Process

The EPR Addendum consultation process is based on the following guiding principles:

- That a reasonable effort was made to ensure that potentially affected or interested parties have information available to them and are provided the opportunity to make their views known;
- Consultation will be open, transparent, and documented so that the process can be understood and tracked;
- The process will be responsive by addressing comments and issues throughout the Project and recording it in this EPR Addendum; and
- The process will be flexible by allowing responses to new issues that emerge as the Project proceeds.

In order to achieve these goals all consultation activities were completed in accordance with O. Reg. 231/08.

5.2 Project Organization and Consultation Process

The TPAP, under O. Reg. 231/08, is a focused process, approved by the MOECC that recognizes and addresses the predictable environmental impacts and effects of transit projects.

As previously noted, the EPR prepared for the BRCE Project was provided notice to proceed by the Minister of the Environment and Climate Change on October 5, 2017 and this EPR Addendum was prepared in accordance with Section 15(1) of O. Reg. 231/08. The following are the key steps in the EPR Addendum process:

- Complete an assessment of any impacts that the change may have on the environment;
- Prepare and make available an EPR Addendum;
- Prepare and distribute a Notice of EPR Addendum (Notice); and
- Conduct a final review by the public and stakeholders prior to proceeding with the Project.

Consultation is an essential component of the Project as it is integral to share information, generate ideas and identify stakeholder issues. An extensive communication and consultation program was undertaken for the New GO Stations to meet and exceed the requirements of Ontario Regulation 231/08 and to inform the community and seek feedback on various aspects of the Project. The general purpose of the consultation program was to identify stakeholders, introduce the EPR Addendum and gather preliminary concerns and comments. The SCR (Appendix A of Volume 1 of this EPR Addendum) documents the communication and consultation with the public and stakeholders prior to the Notice, distribution of the EPR Addendum and it's supporting technical studies, and preparation and distribution of the Notice.

5.2.1 EPR Addendum Consultation Process

The EPR Addendum consultation process was initiated in the summer of 2017, continued through the fall of 2017 and winter of 2018, and included:

- Consultation with the Director, MOECC Environmental Assessment and Permissions Branch (EAPB);
- Preparation of a Master Contact List;
- Establishment of a Project specific Website (http://www.metrolinx.com/newstations);
- Convening Public Meeting #1 (October 2017) in the City of Toronto (for Toronto GO Stations only);
- Convening Public Meeting #2 (March 2018) in the City of Toronto (for Toronto Stations only);
- Convening Public Meeting #1 (April 2018) in the City of Vaughan, Town of Newmarket and Town of Innisfil;
- Convening of Online Town Halls (June 2018) in the City of Toronto (for Toronto Stations only);
- Undertaking Indigenous engagement through identification of and correspondence and meetings with, Indigenous communities and organizations that may have an interest in the Project;
- Convening EA briefs and preliminary design meetings with elected officials, regulatory review agencies, conservation authorities and potentially affected municipalities leading to creation of TACs;
- Convening TAC meetings to provide an overview of public consultation efforts, present preliminary drawings and technical work, identify EPR Addendum developments and obtain input on the EPR Addendum; and
- Circulating draft Technical Reports and the draft EPR Addendum to review agencies, Indigenous communities and other stakeholders.

The sections which follow summarize the EPR Addendum consultation process.

5.2.2 Consultation with the Director

Metrolinx worked to identify a list of Indigenous communities and organizations who may potentially be interested in the Project. Input was sought from the MOECC EAPB about which communities and organizations to include. On October 2, 2017, a formal request was sent to the MOECC EAPB for a list of Indigenous communities that may be interested in the Project. The MOECC's response was taken into account in the development of the list of potential interested Indigenous communities located within 100 kilometers of the study area provided below. The Aboriginal and Treaty Rights Information System (ATRIS) of Indigenous and Northern Affairs Canada (INAC), was referenced to further develop the list of Indigenous communities that may have an interest in the EPR Addendum.

As a result, the following Indigenous communities and organizations were identified as potentially interested in the Project. These communities and organizations were provided with Project information, study updates, draft reports for review and invitations to meet to discuss the Project and provide comments:

- Georgian Bay Métis Council;
- Haudenosaunee Confederacy Chiefs Council;
- Huron Wendate Nation;
- Kawartha Nishnawbe First Nation;
- Métis Nation of Ontario;
- Mississaugas of the New Credit First Nation;
- Moon River Métis Council;
- Moose Deer Point First Nation;
- Six Nations of the Grand River;
- Wahta Mohawks; and
- Williams Treaties First Nations:
  - Alderville First Nation;
  - Beausoleil First Nation;
  - Chippewas of Georgina Island;
  - Chippewas of Rama First Nation;
  - Curve Lake First Nation;
  - Hiawatha First Nation; and
  - Mississaugas of the Scugog Island First Nation.

Contact information was collected for those communities with a potential interest in the EPR Addendum and included in the Master Contact List, provided in the SCR in Appendix A of Volume 1 of this EPR Addendum.

5.2.3 Master Contact List

A Master Contact List was compiled consisting of regulatory agencies, conservation authorities, municipalities, Indigenous communities and organizations and other parties who may have an interest in the EPR Addendum based on the proposed Project works, proximity to the Project and/or from an expressed interest in the BRCE EPR, and were identified on the BRCE EPR contact list. The Master Contact List was developed following initial consultations with the Director of the MOECC, subsequent agency consultation and results of the ATRIS search. As well, affected municipalities within the study area were contacted to obtain lists of addresses of property owners within 30 metres for all GO Stations. The Canada Post Precision Targeter

tool was used to identify properties within 200 metres for Toronto stations and 400 metres for all other stations to distribute Notifications. The Master Contact List included the following:

- The Director of the MOECC EAPB;
- The Director of the MOECC Regional Office;
- Indigenous communities and organizations;
- Landowners with properties located within 30 metres of the station footprints;
- Local municipalities (City of Toronto, Regional Municipality of York, hereafter referred to as York Region (including the City of Vaughan and Town of Newmarket) and County of Simcoe (including the Town of Innisfil));
- Conservation authorities with jurisdiction within 30 metres and 100 metres measured from the proposed station footprints;
- Applicable regulatory agencies, in accordance with Schedule 2 of O. Reg. 231/08; and
- Other people, groups or organizations who may have an interest in the EPR Addendum (i.e., rate payers' groups, business improvement area groups, community organizations, etc.).

The Master Contact List was continually updated in response to Project feedback and stakeholder interest, and was used for the distribution of the Notice of EPR Addendum and project consultation notices for Public Meetings and Online Town Halls. As correspondence from stakeholders, regulatory agencies, conservation authorities, municipalities and Indigenous communities was received, the Master Contact List was used to track correspondence to ensure comments were considered and incorporated into the decision-making process for the EPR Addendum. A copy of the Master Contact List (excluding private landowners) is provided in the Stakeholder Consultation Report found in Appendix A of Volume 1 of this EPR Addendum.

5.2.4 Project Website and Social Media

A Project website (http://www.metrolinx.com/newstations) was developed to provide an overview of the consultation process and to keep the public informed of public meetings, provide summaries of public meetings, as well as to afford them an opportunity to provide their respective comments. The website was updated with Project information and notices throughout the consultation process. Additionally, a website was also developed to provide information and updates to the public on SmartTrack stations (http://www.smarttrack.to/), which were being assessed under a separate process, and included information on the new GO Stations being planned within Toronto.

5.2.5 Public Meeting #1 - Spadina-Front and Bloor-Lansdowne GO Stations

As part of the consultation process, a Public Meeting (Public Meeting #1) was held on October 12, 2017 at the New Horizons Tower located in the City of Toronto. The purpose of Public Meeting #1 was to discuss the proposed new SmartTrack and GO Stations, with specific focus on eight Toronto-based stations, including Spadina-Front and Bloor-Lansdowne GO Stations,

and present information regarding Metrolinx's transportation goals and background on the EPR Addendum, while providing the public with an opportunity to comment on the Project.

The Notice of Public Meeting #1 included date, location, time and Project purpose. The Notice was posted in the Toronto Metro newspaper. It was also published in the Senthamarai (Tamil), Ming Pao (Manderin) and Sing Tao (Traditional Chinese) newspapers, posted on the Metrolinx and City of Toronto websites, and on Metrolinx's Twitter feed. The Notice of Public Meeting #1 was delivered to all property owners within 100 metres of the Barrie rail corridor (measured from the limit of the ROW).

Comments received as a result of Public Meeting #1 noted concerns regarding noise, increased pedestrian and vehicle traffic, construction impacts and safety of residents. Details of the public meetings including a summary of issues/concerns and BRCE EPR Addendum Project team responses, are provided in the Public Meeting #1 Summary Report included in the SCR provided in Appendix A of Volume 1 of this EPR Addendum.

5.2.6 Public Meeting #2 - Spadina-Front and Bloor-Lansdowne GO Stations

As part of the consultation process, a Public Meeting (Public Meeting #2) was held on March 1, 2018 at Lithuanian House in the City of Toronto. The purpose of Public Meeting #2 was to present information on the draft technical studies that had been undertaken as part of the TPAP process and also provide an update on the station designs while providing the public with an opportunity to comment on the Project.

The Notice of Public Meeting #2 included dates, location, time and Project purpose. The Notice was posted in local newspapers, including the Toronto Metro, and French language newspaper Toronto L'Express. It was also published in the Senthamarai (Tamil), Ming Pao (Manderin) and Sing Tao (Traditional Chinese) newspapers. Details of the public meetings were displayed on televisions at all TTC subway plateforms and in advertisements at select existing GO stations, on the Project and City of Toronto websites, with messaging also displayed on the Metrolinx (@MXNotices) and Toronto (@TorontoComms and @CityPlanTO) Twitter feeds. The Notice of Public Meeting #2 was delivered to all stakeholders on the Master Contact List. The Notice of Public Meeting #2 was delivered by addressed mail to property owners within 30 metres of each station study area and delivered via Canada Post unaddressed mail drop to properties within a 200 metres radius from each station.

Comments received as a result of Public Meeting #2 noted concerns regarding traffic, noise, vibration, construction impacts, air quality, connections and pedestrian access. Details of the public meetings including a summary of issues/concerns and BRCE EPR Addendum Project team responses, are provided in the Public Meeting #2 Summary Report included in the SCR provided in Appendix A of Volume 1 of this EPR Addendum.

5.2.7 Public Meeting #1 – Innisfil, Mulock and Kirby GO Stations

As part of the consultation process, Public Meetings (Public Meeting #1) were held on three separate dates in April of 2018, in the Town of Innisfil at Cookstown Library and Community Centre on April 3, in the Town of Newmarket at the Newmarket Municipal Offices on April 5, and in the City of Vaughan at the Vellore Village Community Centre on April 30 for the Innisfil, Mulock and Kirby GO Stations, respectively. The purpose of Public Meeting #1 was to present

information about the Project and EPR Addendum process, present information about the RTP which guides the work being carried out to transform the transportation network in the GTHA and to provide the public with an opportunity to comment on the Project.

The Notices of Public Meeting #1 included the dates, locations, time and Project purpose. The Notices were posted in local newspapers (Barrie Advance, Innisfil Journal, Newmarket Aurora Era Banner, and Vaughan Citizen) and French language papers (Toronto Le Metropolitain and Toronto L'Express), notices were also posted on the Project Website, with messaging displayed on the Metrolinx Twitter feed. A general unaddressed ad mail (Canada Post drop) of the notices was sent to property owners within a minimum of 400 metres of each station footprint. In addition to the general ad mail, addressed mail was sent to all property owners whose properties were identified (via municipal records and GIS mapping), to be within 30 metres of each station footprint. In addition, personalized addressed letters were sent to owners of properties identified as potentially directly impacted by the Project (i.e., acquisition, easement, etc.), in addition to the notification.

Comments received as a result of Public Meeting #1 noted concerns related to noise and vibration, coordination of local transit and station access, lack of available parking, potential impacts on traffic, LOS and scheduling of additional GO service, accessibility of stations and potential need for property acquisitions. A summary of issues/concerns and BRCE EPR Addendum Project team responses, are provided in the Public Meeting #1 Summary Report included in the Stakeholder Consultation Report provided in Appendix A of Volume 1 of this EPR Addendum.

5.2.8 Online Town Hall – Spadina-Front and Bloor-Lansdowne GO Stations

As part of the consultation process, Online Town Halls were conducted via telephone and online on June 20, 2018 for Spadina-Front GO Station and June 21, 2018 for Bloor-Lansdowne GO Station. The purpose of the Online Town Halls was to provide an update of the work underway, including environmental studies for the new SmartTrack and GO Stations.

The Notice of the Online Town Halls included meeting details such as the dates, time, connection instructions and Project purpose. Participants attended the Online Town Halls by visiting smarttrack.to/townhall or by calling 800-457-6180. The notification was posted in local newspapers including the Toronto Metro, and French language newspapers Toronto L'Express and Le Metropolitain. It was also published in the Senthamarai (Tamil), Ming Pao (Manderin), Sing Tao (Traditional Chinese), Philippine Reporter, Sol Português (Portuguese), Bloor West Village/Annex Guardian, East York and Beach Mirror, Etobicoke Guardian, Scarborough Mirror, and Caribbean Camera newspapers and posted on Metrolinx's website with messaging displayed on the Metrolinx Twitter feed.

Recordings and transcripts of the Online Town Halls are available on the Project website.

5.2.9 General Public and Property Owner Correspondence

Comments were received from the public and other stakeholders through the dedicated email address for the Project (newstations@metrolinx.com), as well as through the dedicated SmartTrack email address (SmartTrack@toronto.ca), throughout the consultation process,

exclusive of public meetings. Correspondence generally included requests to be included on the mailing list and requests for Project information following public meetings.

Other submissions were of a specific nature, noting questions/concerns with the EPR Addendum. Key themes of the comments included:

- Concern with train whistle blowing;
- Potential Impacts to property;
- Traffic impacts during construction;
- Station design (i.e. accessibility, parking, cycling and pedestrian infrastructure);
- Coordination of service with local transit; and
- Safety and development of crossings.

Written submissions and Project team responses are provided in the SCR found in Appendix A of Volume 1 of this EPR Addendum.

5.3 Indigenous Community and Organization Consultation

5.3.1 Correspondence with Indigenous Communities and Organizations

Metrolinx contacted and/or engaged Indigenous communities and organizations identified as having potential interest in the Project, through written correspondence, by email and newsletters, as well as by phone. Written correspondence to Indigenous communities and organizations was delivered by registered mail and email at the following Project milestones in preparation for the EPR Addendum:

- Indigenous community meeting with Huron-Wendat Nation – September 6, 2017;
- Request for Input, Offer for Community Meeting and Invitation to Public Meeting #1 – September/October 2017;
- Project Update, Request for Input, Offer for Community Meeting and Invitation to Public Meeting #2 – Febuary 2018;
- Indigenous community meeting with the Williams Treaties First Nations – March 19, 2018;
- Invitation to Public Meeting #1 – March and April 2018;
- Circulation of Draft Stage 1 AAs – May 2018;
- Indigenous community meeting with the Williams Treaties First Nations – June 8, 2018;
- Invitation to Online Town Hall – June 13, 2018; and
- Indigenous community meeting with the Mississaugas of the New Credit First Nation – July 18, 2018.

The Request for Input, Offer for Community Meeting and Invitation to Public Meeting #1 which was sent to all communities in September/October 2017 also expressed Metrolinx interest to

work with communities to identify current use of land and resources for traditional purposes that may be affected by the new GO Stations, SmartTrack and RER, and also to identify acceptable mitigation measures.

On several occasions, Metrolinx and the City of Toronto reached out to all Indigenous communities in attempt to arrange in-person meetings to discuss the Project, SmartTrack and other ongoing Metrolinx projects. All Indigenous communities were provided an opportunity to meet in person with Metrolinx to discuss the Project in advance of the Notice of EPR Addendum. Table 5-1 provides a summary of meetings held with Indigenous communities and organization in which the Project was discussed. All Williams Treaties First Nations were invited to the meetings on March 19, 2018 and June 8, 2018; however, only those listed in Table 5-1 were in attendance.

Table 5-1: Summary of Meetings with Indigenous Communities and Organizations

Indigenous Communities or Organization	Meeting Date	Meeting Summary
Huron-Wendat Nation	September 6, 2017	Provided an overview of the Project and in-progress AAs.
Williams Treaties First Nations: • Alderville First Nation • Chippewas of Rama First Nation • Hiawatha First Nation	March 19, 2018	Provided an overview of the Project and in-progress AAs.
Williams Treaties First Nations: • Alderville First Nation • Curve Lake First Nation • Hiawatha First Nation • Scugog Island First Nation	June 8, 2018	Provided an overview of the Project and in-progress archaeological assessments.
Mississaugas of the New Credit First Nation	July 18, 2018	Provided an overview of the Project and in-progress archaeological assessments.

A list of the Indigenous communities contacted during preparation of the EPR Addendum is provided in Table 5-2.

All communities and organizations were sent a letter accompanying the Notice of EPR Addendum in advance of the August 2, 2018 Notice of EPR Addendum. The letter and Notice were sent via registered mail and email including a summary of the Project's process, consultation efforts completed, a schedule of Project dates including the anticipated date of the Notice to Allow a Change to a Transit Project in Accordance with an Addendum, and the opportunity to comment on the Project. An offer to meet in person to discuss the project was

also included in the Notice of EPR Addendum letter to all communities. Follow up calls were made to all communities to confirm receipt of the Notice. A record of detailed correspondence with Indigenous communities and organizations, including follow-up calls and emails is provided in Stakeholder Consultation Report in Appendix A of Volume 1 of this EPR Addendum.

Full comments through correspondence and minutes of meetings are provided Stakeholder Consultation Report provided in Appendix A of Volume 1 of this EPR Addendum. A summary of comments provided by Indigenous communities is as follows:

- Huron Wendat Nation - Comments received were specific to the Stage 1 archeological assessments (Toronto-based stations) that were provided for review; and
- Mississaugas of the New Credit First Nation – Comments received were specific to the Stage 1 Archeological Assessments (Toronto-based stations) that were provided for review.

Table 5-2: List of Indigenous Communities Contacted During the BRCE EPR Addendum Consultation Process

Indigenous Communities	Notice of Public Meeting #1 (Toronto Stations)	Notice of Public Meeting #1 (Kirby, Mulock and Innisfil GO Stations)	Notice of Public Meeting #2 (Toronto Stations)	Review of Stage 1 Archaeology Assessment (Toronto Stations)	Review of Stage 1 Archaeology Assessment (Kirby, Mulock and Innisfil GO Stations)	Opportunity to Review Environmental Project Report Addendum
Georgian Bay Métis Council	✓	✓	✓	✓	✓	✓
Haudenosaunee Confederacy Chiefs Council	✓	✓	✓	✓	✓	✓
Huron Wendate Nation	✓	✓	✓	✓	✓	✓
Kawartha Nishnawbe First Nation:	✓	✓	✓	✓	✓	✓
Métis Nation of Ontario:	✓	✓	✓	✓	✓	✓
Mississaugas of the New Credit First Nation	✓	✓	✓	✓	✓	✓
Moon River Métis Council:	✓	✓	✓	✓	✓	✓
Moose Deer Point First Nation	✓	✓	✓	✓	✓	✓
Six Nations of the Grand River	✓	✓	✓	✓	✓	✓
Wahta Mohawks	✓	✓	✓	✓	✓	✓
Williams Treaties First Nations	✓	✓	✓	✓	✓	✓
Alderville First Nation	✓	✓	✓	✓	✓	✓

Indigenous Communities	Notice of Public Meeting #1 (Toronto Stations)	Notice of Public Meeting #1 (Kirby, Mulock and Innisfil GO Stations)	Notice of Public Meeting #2 (Toronto Stations)	Review of Stage 1 Archaeology Assessment (Toronto Stations)	Review of Stage 1 Archaeology Assessment (Kirby, Mulock and Innisfil GO Stations)	Opportunity to Review Environmental Project Report Addendum
Beausoleil First Nation	✓	✓	✓	✓	✓	✓
Chippewas of Georgina Island	✓	✓	✓	✓	✓	✓
Chippewas of Rama First Nation	✓	✓	✓	✓	✓	✓
Curve Lake First Nation:	✓	✓	✓	✓	✓	✓
Hiawatha First Nation	✓	✓	✓	✓	✓	✓
Mississaugas of the Scugog Island First Nation	✓	✓	✓	✓	✓	✓

5.4 Agency and Municipal Consultation

As part of the consultation process, Metrolinx met with elected officials, regulatory agencies, conservation authorities and municipalities with jurisdiction within the Barrie rail corridor. During the summer and fall of 2017, Metrolinx initially met with elected officials, agencies and municipalities on an individual basis to present an overview of the New GO Stations. Following these preliminary meetings, TACs were established by municipality and grouped by Region, and up to four of TAC meetings by station were held as the Project progressed. Additionally, elected officials, agencies and municipalities provided input to the Project through scheduled meetings and written correspondence regarding Project specific questions.

A Notice of EPR Addendum was first issued and published on August 2, 2018, in order to inform the regulatory agencies, and other interested parties of the initiation of the Project. All agencies identified in the Master Contact List were provided with Notices of EPR Addendum.

5.4.1 Meetings with Agencies, Conservation Authorities, Municipalities and Technical Advisory Committees

At each meeting, Metrolinx presented an overview of the BRCE EPR Addendum Project status, reviewed preliminary plans and drawings, as well as discussed issues of importance or concern with participants such as technical study methodology and results. Meeting dates, participating regulatory agencies and elected officials are listed in the Stakeholder Consultation Report provided in Appendix A of Volume 1 of this EPR Addendum. Participating regulatory agencies included the following:

- Ministry of the Environment and Climate Change (MOECC);
- Ministry of Tourism, Culture and Sport (MTCS);
- Ministry of Natural Resources and Forestry (MNRF - Aurora and Midhurst Districts);
- Toronto and Region Conservation Authority (TRCA);
- Lake Simcoe Region Conservation Authority (LSRCA);
- City of Toronto;
- York Region;
- City of Vaughan;
- Town of Newmarket;
- County of Simcoe;
- Town of Innisfil;
- Hydro One;
- Newmarket Hydro;
- Toronto Transit Commission (TTC); and
- York Region Transit (YRT).

Minutes were taken at each meeting and are provided in Appendix A of Volume 1 of this EPR Addendum. Key themes of discussion included:

- Grade separations and pedestrian crossings;
- Natural environment;
- Impacts to adjacent planned developments;
- New GO Station locations;
- Station access;
- Air quality;
- Noise and vibration;
- Water resources;
- Climate change;
- Cultural heritage;
- Archaeology; and
- Consultation and engagement activities.

5.4.2 Meetings with Elected Officials

Metrolinx met with Members of Provincial Parliament (MPPs) during a Barrie RER Committee meeting held on November 8, 2017, to present an overview of the Project. As the Project progressed, Members of Parliament (MPs), MPPs and elected officials were notified of public meetings, offered project briefings and informed of the opportunity to provide input to the Project. Members of Parliament (MPs), MPPs and elected officials provided notification during the course of the EPR Addendum are listed in Table 5-3. Correspondence with elected officials is provided in the Stakeholder Consultation Report in Appendix A of Volume 1 of this EPR Addendum.

Table 5-3: Elected Officials Sent a Notificaiton of the Meeting

Legislative Assembly of Ontario	Members of Parliament
• Steven Del Duca, MPP Vaughan; • Chris Ballard, MPP Newmarket-Aurora; and • Julia Munro, MPP York-Simcoe	• Adam Vaughan, MP Spadina-Fort York • Julie Dzerowicz, MP Davenport • Judy Sgro, MP Humber River-Black Creek • Ahmed Hussen, MP York South-Weston • Deb Schulte, MP King-Vaughan • Francesco Sorbara, MP Vaughan-Woodbridge

Legislative Assembly of Ontario	Members of Parliament
	• Peter Van Loan, MP York-Simcoe • John Brassard, MP Barrie-Innisfil
City of Toronto	**City of Vaughan**
• Frances Nunziata, Councillor • Gord Perks, Councillor • Cesar Palacio, Councillor • Ana Bailão, Councillor • Mike Layton, Councillor • Paula Fletcher, Councillor • Michelle Holland, Councillor • Michael Thompson, Councillor • Chin Lee, Councillor; and • Norm Kelly, Councillor	• Maurizio Bevilacqua, Mayor; • Gino Rosati, Regional Councillor; • Alan Shefman, Councillor; • Marilyn Iafrate, Councillor: • Tony Carella, Councillor: • Rosanna DeFrancesca, Councillor; and • Councillor Sandra Yeung Racco.
Town of Newmarket	**Town of Innisfil**
• Tony Van Bynen, Mayor; • John Taylor, Deputy Mayor; • Tom Vegh, Councillor; • Dave Kerwin, Councillor; • Jane Twinney, Councillor; • Tom Hempen, Councillor; • Bob Kwapis, Councillor; • Kelly Broome; Councillor; and • Christina Bisanz; Councillor.	• Gord Wauchope, Mayor; • Lynn Dollin, Deputy Mayor; • Doug Loughead, Councillor; • Richard Simpson, Councillor; • Donna Orsatti, Councillor; • Stan Daurio, Councillor; • Bill Loughead, Councillor; • Carolyn Payne, Councillor; and • Rob Nicol, Councillor

5.4.3 Agency and Municipal Correspondence

In addition to the meetings described above, written correspondence was also received from elected officials, agencies and municipalities. Correspondence was received from the MNRF, TRCA, LSRCA, MOECC, Transport Canada, Ontario Heritage Trust, and MTO, as well as provincial, federal and municipal elected officials. Municipal correspondence was received from staff of the City of Toronto, York Region, City of Vaughan, Towns of Newmarket, the County of Simcoe, and the Town of Innisfil. Copies of correspondence are provided in the SCR (Appendix

A of Volume 1 of this EPR Addendum) and generally included acknowledgement of receipt of Notice(s) as well as contacts for correspondence and TAC meeting participation. Comments of a specific nature, noting questions/concerns, are summarized by key theme, and provided in the SCR (Appendix A of Volume 1 of this EPR Addendum).

A Notice of EPR Addendum was sent to regulatory agencies on August 2, 2018. The Notice of EPR Addendum included information about the Project.

5.4.4 Review of Draft Technical Reports and Draft Environmental Project Report to Regulatory Agencies, Conservation Authorities, Municipalities and Indigenous Communities and Organizations

Regulatory agencies, conservation authorities, Indigenous communities and organizations, and municipalities were provided with an opportunity to review draft Technical Reports and the EPR Addendum prior issuing to the Notice of EPR Addendum. Select individual draft Technical Reports were forwarded to those agencies anticipated to have a specific interest in the subject matter in advance of the comprehensive draft EPR Addendum. The draft EPR Addendum was provided to those agencies considered to have an interest in the Project. Table 5-4 lists the draft Technical Reports and the agencies to which they were submitted for review.

Table 5-4: Draft Technical Reports and Draft Environmental Project Report Addendum Reviewed by Agencies and Indigenous Communities[1]

Agency	Natural Environment Report	Tree Inventory Plan	Stage 1 Archaeology Assessment	Cultural Heritage Screening Report	Socio-Economic and Land Use Study	Air Quality Impact Assessment	Noise and Vibration Impact Assessment	Transportation and Traffic Impact Analysis	Environmental Project Report Addendum	Report Comments Received
MOECC	✓	✓	✓	✓	✓	✓	✓	✓	✓	AQIA (all), NVIA (all).
MTCS				✓					✓	CHSR (all except Mulock), EPR Addendum.
MNRF	✓	✓							✓	NER (all), TIP (Innisfil only), EPR Addendum.
Indigenous communities[2]			✓							Stage 1 Arch[1]
TRCA	✓	✓							✓	NER (all except Mulock and Innisfil), TIP (Kirby only), EPR Addendum.
LSRCA	✓	✓							✓	NER (Innisfil and Mulock only), TIP (Mulock only), EPR Addendum.
City of Toronto					✓			✓	✓	SELUS (only Spadina-Front and Bloor-Lansdowne), Transportation Brief (Spadina-Front only), TTIA (Bloor-Lansdowne only).
York Region								✓	✓	TTIA (Kirby and Mulock only), EPR Addendum.
City of Vaughan	✓	✓			✓	✓	✓	✓	✓	NVIA (Kirby only), AQIA (Kirby only), SELUS (Kirby only), TIP (Kirby only), TTIA (Kirby only), EPR Addendum.
Town of Newmarket					✓			✓	✓	SELUS (Mulock only), TTIA (Mulock only), EPR Addendum.

Agency	Natural Environment Report	Tree Inventory Plan	Stage 1 Archaeology Assessment	Cultural Heritage Screening Report	Socio-Economic and Land Use Study	Air Quality Impact Assessment	Noise and Vibration Impact Assessment	Transportation and Traffic Impact Analysis	Environmental Project Report Addendum	Report Comments Received
County of Simcoe								✓	✓	TTIA (Innisfil only), EPR Addendum.
Town of Innisfil					✓			✓	✓	SELUS (Innisfil only), TTIA (Innisfil only).

[1] *As of June 8, 2018*

[2] *See Section 5.3.1 for list of Indigenous Communities*

5.5 Incorporation of Stakeholder Comments

Metrolinx will incorporate the comments and input as appropriate from stakeholders into the design of the GO Stations prior to and throughout the detailed design phase of the Project. Upon completion of the EPR Addendum, consultation with members of the public and interested stakeholders will continue, to support the design and construction of the new GO Stations and ensure continued communication on the Project.

5.6 Commitments to Future Consultation

Metrolinx has committed to ensuring that consultation with regulatory agencies, municipalities, the public, Indigenous communities and organizations and other interested parties will continue throughout detailed design and prior to construction, as well as during the construction and operational phases of the Project. A Consultation Plan will be prepared at the commencement of each of these phases and will include, as applicable:

- Notifications to all stakeholders of major milestones, and any Project amendments;
- Opportunities for members of the public, otherstakeholders and Indigenous communities and organizations to meet for discussions and feedback with regards to the Project;
- Documentation of public concerns and Metrolinx's responses; and
- Any additional regulatory consultation and notification requirements.

5.7 Notice of EPR Addendum

The Notice of EPR Addendum was published on August 2, 2018. The Notice was distributed by addressed mail to all property owners within 30 metres of each GO Station footprint and distributed as an unaddressed community mailer to residents within 200 metres of each Toronto station and 400 metres of other stations. The Notice of EPR Addendum was posted on the Project and SmartTrack project websites, posted in local newspapers, distributed by email to all contacts on the master contact list which includes interested and affected residents, anyone who has expressed an interest in the Project, regulatory agencies, conservation authorities, municipalities and Indigenous communities and organizations.

The Notice of EPR Addendum provided the public and all communities with the remaining milestones and dates for the Project, along with the opportunity to review the EPR Addendum and submit comments.

Following the 30-day public review period, the Minister has 35 days to provide comment and decide whether the EPR Addendum has any negative effects of Provincial significance and if the proponent is required to take further steps. The Minister then issues a Notice to Allow a Change to a Transit Project in Accordance with an Addendum. The Notice will be posted on both the City of Toronto and Metrolinx websites.

6. Permit and Approval Requirements

In addition to carrying out the TPAP, there are a number of additional federal, provincial, municipal, and other permit and approval requirements that must be secured to proceed to implementation. The following sections identify the various permits, approvals and agreements that may be required by federal, provincial, municipal agencies, conservation authorities,

utilities and transit/rail corporations for all phases of the Project including the detailed design, construction and post-construction periods.

Metrolinx will continue to monitor conditions associated with the Project that could "trigger" the need for additional permit or approval requirements as the Project is carried forward to detailed design and construction. The following list is identified by jurisdiction and is intended to cover all potential permit and approval requirements based on the GO Station design and feedback received from regulatory agencies to date. It is noted that Metrolinx may not be required to obtain permits/approvals from all of the parties discussed below and where clarification is necessary, consultation will be undertaken with the approval agency responsible for issuing such a permit or approval to confirm its applicability to the Project.

6.1 Federal

The following section identifies the federal requirements that are anticipated to be required for the work activities associated with the Project, as summarized in Table 6-1.

Table 6-1: Summary of Applicable Federal Permits and/or Approvals

Permit, Approval or Agreement Required	Federal Agency
Request for Review of Endangered Species – Consultation (*Fisheries Act*)	DFO
MBCA and SARA Consultation	Environment Climate Change Canada (ECCC)
Risk assessment to be completed in accordance with the Railway Safety Management System Regulations for all Project components.	Transport Canada

6.1.1 Canadian Environmental Assessment Agency

Under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), the Regulations Designating Physical Activities identify the types of projects that may require a Federal EA. The Project does not constitute a designated project under CEAA 2012.

6.1.2 Environment and Climate Change Canada

6.1.2.1 Species at Risk Act

The federal SARA provides a framework to ensure the survival of wildlife species and the protection of natural heritage in Canada. Under SARA, the federal government has responsibility for wildlife on federal lands. On private lands, SARA protection applies to: aquatic species listed as endangered, threatened or extirpated in Schedule 1 of SARA; migratory birds protected under the MBCA; and species in certain cases where provincial / territorial measures do not adequately protect a species.

Permits for activities affecting a Schedule 1 species in a national protected heritage area are administered by Parks Canada. For activities affecting a Schedule 1 aquatic species, permits are administered by DFO. All other SARA permit requests are administered by the ECCC.

As part of the EPR Addendum, background reviews of potential Schedule 1 SARA habitat located in and within proximity to the GO Station study areas were completed and documented

within the NERs prepared in support of this EPR Addendum and is provided in Appendix B of Volume 2 through Volume 6, herein. As documented in the NERs, a number of species listed on Schedule 1 of SARA have the potential to be affected by the Project. Thus, further field surveys will be carried out prior to the construction phase to confirm the presence/absence of species listed as Endangered, Threatened or Extirpated within the GO Station study areas in accordance with SARA. If one or more listed species are confirmed present, a SARA permit application will be submitted to ECCC.

6.1.3 Fisheries and Oceans Canada

In accordance with the *Fisheries Act*, approval from DFO is required where the Project work activity could potentially result in serious harm to fish or fish habitat that are part of a Commercial, Recreational (CRA), or Aboriginal Fishery, as defined in the Act. Under the Act, the definition of "Fish Habitat" includes "spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or to carry out their life processes" (p. 2).

In keeping with the DFO requirements under the *Fisheries Act*, self-assessments will be undertaken where Project work is proposed in, or near-water (such as at the western limit of the Mulock study area where the East Holland River meanders through the site) to determine whether the Project will involve "serious harm" to fish.

Where potential effects to fish or fish habitat cannot be avoided, and the Project activities could result in "serious harm" to fish, the DFO will be consulted and a Request for Review will be submitted. Based on the DFO's review, Metrolinx may require an authorization prior to conducting the work.

6.1.4 Transport Canada

6.1.4.1 Railway Safety Act

Pursuant to the *Railway Safety Act*, R.S.C., 1985 the Railway Safety Management System Regulations (2015) sets out the minimum requirements with respect to safety management systems that must be developed and implemented to achieve the highest level of safety in railway operations. The Project will comply with the safety management system requirements identified within this regulation including the completion of risk assessments that will be conducted for all components of the Project.

6.2 Provincial

The following section identifies the provincial requirements that are anticipated to be required for the work activities associated with the Project, as summarized in Table 6-2.

Table 6-2: Summary of Applicable Provincial Permits and/or Approval Requirements

Permit or Approval Required	Provincial Agency
Environmental Compliance Approval (ECA) – Noise & Vibration	MOECC
EASR - O. Reg. 1/17: Registrations Under Part II.2 of the Act - Activities Requiring Assessment of Air Emissions	MOECC
ECA – Stormwater	MOECC

Permit or Approval Required	Provincial Agency
ECA – Groundwater & Surface Water	MOECC
ECA – Sewage Works	MOECC
ECA – Waste Management System – Mobile Waste Processing	MOECC
Well Abandonment and Source Protection	MOECC
PTTW/EASR (O. Reg. 387/04)	MOECC
Hazardous Waste Information Network (HWIN) Registry (O. Reg. 347)	MOECC
ESA – Regulatory Exemption Permit	MNRF
Licence to Collect Fish for Scientific Purposes	MNRF
CHER	MTCS
Stage 1 AA	MTCS
HIA	MTCS
Strategic Conservation Plans	MTCS
Designated Substance Surveys, Abatement/Management Plans	MOL

6.2.1 Ministry of the Environment and Climate Change

6.2.1.1 Environmental Compliance Approval – Noise and Vibration

In accordance with the *Environmental Protection Act* (EPA, 1990), a project must have environmental approval from the MOECC if it will result in the anticipated release of pollutants into the air, land or water. An environmental approval sets out operational rules for these activities in order to protect the natural environment. Under Part II.1 of the EPA, an ECA will be required from the MOECC for the Project in relation to GO Stations components that have the potential to produce emissions associated with noise and vibration (e.g. from generators and snowmelt boiler room operations), prior to its commissioning. An ECA will be obtained prior to the construction phase.

There is potential for the MOECC to require an Acoustic Audit as a condition of the ECA, which would require a monitoring study to be completed by an independent third party during the construction and operations/maintenance phases. The purpose of this audit would be to demonstrate that the Project complies with the MOECC sound level limits outlined in the ECA.

6.2.1.2 Environmental Activity and Sector Registry - O. Reg. 1/17: Registrations Under Part II.2 of the Act - Activities Requiring Assessment of Air Emissions

Projects that are engaging in activities prescribed in regulation for the purposes of the EASR regime are required by the EPA to register those activities in the EASR. Subject to provision for prescribed activities that require an ECA, as of January 31, 2017, activities with air emissions prescribed by O. Reg. 1/17 must be registered in the EASR.

Prior to construction the prescribed activities under the Air Emissions EASR regulation will be registered in the EASR.

6.2.1.3 *Environmental Compliance Approval - Stormwater Works*

For compliance with the EPA, a project must have environmental approval from the MOECC if it is anticipated to release pollutants into the land or water or stores, transports or disposes of waste. An environmental approval sets out operational rules for these activities in order to protect the natural environment. Under Part II.1 of the EPA, an ECA and SWM Plan will be required from the MOECC for the Project in relation to approval of the GO Stations that result in discharges. The ECA will be obtained prior to the construction phase. Any conservation authority and municipal review comments submitted to Metrolinx will be provided to the MOECC as part of the ECA application for Stormwater Works.

As part of the ECA - Stormwater Works submission for the Project, reference to any existing ECAs for other SWM Systems that are intended to be associated with the proposed system will be included as part of the supporting documents.

6.2.1.4 *Temporary Environmental Compliance Approval - Groundwater and Surface Water*

A Geotechnical Investigation and Hydrogeological Study will be carried out for each GO Station site prior to the construction phase, and will include the analysis of soil and groundwater samples for potential contamination. If the Geotechnical Investigation and Hydrogeological Study confirm the presence of contaminated groundwater, Metrolinx will apply for a temporary ECA from the MOECC to facilitate the discharge of groundwater during construction. For areas where it is identified that construction may affect groundwater, a groundwater monitoring and treatment plan/program for pre-construction and construction periods may be required, in accordance with the MOECC ECA requirements and conditions. It is noted that this temporary ECA is a separate application from the permanent SWM System ECA.

6.2.1.5 *Environmental Compliance Approval – Sewage Works*

For compliance with the EPA, and Section 53 of the OWRA, a project must have environmental approval from the MOECC if it uses, operates, establishes, alters, extends or replaces new or existing sewage works. An environmental approval sets out operational rules for these activities in order to protect the natural environment.

6.2.1.6 *Environmental Compliance Approval – Waste Management System – Mobile Waste Processing*

Under Section 27 of the EPA, a project must have approval from the MOECC to use, operate, alter, enlarge or extend a waste management system or a waste disposal except under and in accordance with an ECA. Depending on the methods and equipment used during construction an ECA – Waste Management System – Mobile Waste Processing may be required.

6.2.1.7 *Well Abandonment and Source Protection*

The MOECC regulates well abandonment under O. Reg. 903 of the OWRA.

It is not expected that any of the municipal wells documented within the NERs in proximity to the GO Station study areas will require abandonment to facilitate implementation of the Project. There may, however, be additional wells, for example monitoring wells, present on properties within the GO Station study areas that will be acquired to facilitate the Project (i.e., obtained through property acquisition) that will require decommissioning. Should wells be identified prior to the construction phase of this Project that require decommissioning, these wells must be

abandoned in accordance with O. Reg. 903 by a Licensed Well Contractor, and records provided to Metrolinx System Safety.

6.2.1.8 Permit to Take Water

The need for dewatering during construction activities will be confirmed prior to construction, as will the permitting/registration requirements. The requirements for dewatering during construction are dependent on the locations, depth and extent of excavation required for the Project. Excavations at drainage structures are likely to encounter shallow groundwater and higher inflow rates because of the potential for recharge from surface water sources. The proposed dewatering requirements at each drainage structure will be assessed once details of the excavation dimensions, depths and precise locations are available prior to the construction phase.

As part of the detailed design phase, Geotechnical Investigations and Hydrogeological Studies will be completed for the station sites which will identify the expected volume of water taking during dewatering, and the potential effects of dewatering activities. In addition, these studies will include an assessment of proposed mitigation strategies, and development of a preferred strategy to mitigate anticipated effects and facilitate preparation of an excavation discharge plan. The determination of which process is to be followed (PTTW or EASR) is based on the expected volume of water taking during dewatering. For takings between 50,000 litres/day and 400,000 litres/day, registration for the EASR is required, while takings above 400,000 litres/day are regulated by the PTTW process. For takings that will be in excess of 400,000 litres/day, a Category 3 PTTW is required in accordance with Section 34 of the OWRA. In addition, the permit application must be accompanied by a Groundwater Study completed by a qualified person (i.e., licensed Professional Geoscientist or accepted Professional Engineer as set out in the *Professional Geoscientists Act*, 2000 of Ontario).

A review by the appropriate conservation authority, either TRCA or LSRCA as applicable, will also be required should dewatering be necessary during construction. This will be confirmed prior to the construction phase, following completion of the aforementioned Geotechnical Investigations and Hydrogeological Studies.

6.2.1.9 Waste Transportation and Processing

In accordance with *Ontario Regulation 347 - "General - Waste Management"* (O. Reg. 347), under the EPA, subject waste activities must be registered with the MOECC. The HWIN allows excess subject waste generated on-site and requiring off-site removal to be registered with the MOECC online and to pay hazardous waste fees as required under the Land Disposal Restrictions outlined in the EPA.

All waste materials will be manifested with records maintained by Metrolinx during construction of the Project and any subject waste identified during construction of the Project will be transported to a licensed facility for processing, transfer or disposal.

6.2.2 Ministry of Natural Resources and Forestry

6.2.2.1 Endangered Species Act Permit

The MNRF provides protection to Endangered or Threatened Species of plants and animals and their habitat by restricting project activities that may affect these plants, animals or habitats

in accordance with the ESA. The MNRF maintains an Ontario list of SAR which it uses to guide work activities to prevent, minimize and compensate for adverse effects on the protected species and habitats through appropriate timing, location and methods of activities. If avoidance is not possible, regulatory exemption permits can be requested from the MNRF for authorization to proceed with activities that would otherwise contravene the ESA. This permit is approved by the MNRF and includes conditions that must be met to protect and recover the SAR.

Species of special concern, the lowest risk category under the ESA, may be protected under other various existing laws (i.e., *Fish and Wildlife Conservation Act*, MBCA, *Fisheries Act*). Areas of significant habitat for species of special concern are protected under the PPS and OPs as SWH.

As discussed in Section 3.5.7 of this EPR Addendum, a number of Threatened and/or Endangered species have been identified to potentially reside in the GO Station stdy areas and as a result, a number of SAR have the potential to be affected by the five proposed GO Stations during background review to potential reside in the GO Station study areas. Further field surveys will be carried out prior to the construction phase to confirm the presence/absence of these species within the GO Station study areas in accordance with the MNRF species specific survey windows and protocols. If SAR are confirmed present, and Project effects to SAR cannot be avoided, a permit from, or registration of activity with the MNRF will be required. Metrolinx will continue to consult with the MNRF and keep the Ministry informed of the results from all SAR surveys undertaken prior to the construction phase.

6.2.2.2 Fish and Wildlife Conservation Act

A Licence to Collect Fish for Scientific Purposes will also be required under the *Fish and Wildlife Conservation Act* to carry out the Project works at watercourse crossings if in-water works are proposed, which will be confirmed during detailed design. The MNRF issues these licenses to qualified professionals (i.e., Aquatic Ecologist/Biologist) for the purposes of collecting, documenting, and salvaging fish. For the purposes of the Project, fish salvages (and a Licence to Collect Fish) will be required to prevent “serious harm to fish that are part of a CRA Fishery, or to fish that support such a fishery” during construction activities in keeping with the *Fisheries Act*.

A Wildlife Scientific Collector’s Authorization under the *Fish and Wildlife Conservation Act* may also be required to carry out the Project construction works and/or for research purposes (i.e., future wildlife species specific surveys prior to the construction phase). The MNRF will be consulted to determine if such authorization is required. The MNRF issues these authorizations to qualified professionals (i.e., Terrestrial Ecologist/Biologist) for the purposes of collecting, documenting, and salvaging wildlife. For the purposes of the Project, wildlife salvages and documentation may be required. This will be considered in consultation with the MNRF prior to construction and prior to completion of species specific surveys.

6.2.3 Ministry of Tourism, Culture and Sport

As part of the TPAP, a Stage 1 AA, CHSR, and subsequent studies (where necessary) were prepared for each of the five GO Stations subject in this EPR Addendum. These reports were submitted to the MTCS as a condition of licencing in accordance with Part VI of the OHA,

R.S.O. 1990, c 0.18. These are provided in Appendix D and Appendix E of Volume 2 through Volume 6 of this EPR Addendum.

Based on the Stage 1 AA property inspection, it was determined that the majority of the GO Station study areas have been previously disturbed. However, notwithstanding this disturbance, some study areas were found to retain archaeological potential and will require further AA should the detailed design confirm that these areas will be affected by the Project, as reported in the Stage 1 AAs prepared in support of this EPR Addendum (Appendix D and Appendix E of Volume 2 through Volume 6 of this EPR Addendum).

All required AAs must be completed prior to commencement of any Project-related activities. Metrolinx shall only proceed with Project-related activities when all AAs have been completed in compliance with MTCS requirements, and when:

- A letter has been sent by MTCS to the licensed archaeologist confirming that MTCS has added the Report to the Ontario Public Register of Archaeological Reports; and
- The Report states that there are no concerns regarding impacts to archaeological sites.

Through the various cultural heritage assessments, several CHRs were identified. Further study requirements have been identified, including the need to complete HIAs and Strategic Conservation Plans for various features. Metrolinx shall only proceed with Project-related activities when all HIAs/Strategic Conservation Plans have been completed in compliance with MTCS requirements.

6.2.4 Ministry of Labour

6.2.4.1 Designated Substances

In accordance with O. Reg. 490/09, a designated substance survey will be completed for any buildings or structures that require demolition and this provision will be included in the Construction Contract Documents. This assessment is required by the MOL to assess the exposure or likelihood of exposure of a worker to a designated substance in the work place.

Where these assessments identify the presence of designated substances, all abatement/management plans for these substances shall be developed in accordance with the OHSA, R.S.O. 1990 and regulations.

6.3 Conservation Authorities

As an agency of the Province of Ontario, Metrolinx is exempt from the *Conservation Authorities Act* and is not required to obtain permits from applicable conservation authorities. Although formal approval will not be sought, Metrolinx's policy is to adhere to the intent of the relevant permit and approval process to the greatest extent possible.

In the spirit of cooperation, the permit and approval requirements identified in this EPR Addendum also include the information to be submitted to the applicable conservation authorities and the municipalities for comment. The following section identifies the conservation authority requirements for the Project, as summarized in Table 6-3.

Table 6-3: Summary of Applicable Conservation Authority Permits and/or Approvals

Permit or Approval Required	Conservation Authority
Voluntary Review Process	TRCA/LSRCA
SWM Plan	TRCA/LSRCA
Erosion and Sediment Control Plan	TRCA/LSRCA
Dewatering Activity Plan	TRCA/LSRCA
Watercourse Crossing Design	TRCA/LSRCA
Tree Removal, Restoration and Compensation Plan	TRCA/LSRCA

6.3.1 Toronto and Region Conservation Authority

Under the *Conservation Authorities Act*, administered by the MNRF, conservation authorities have been established to manage watersheds throughout most of southern Ontario. In 2006, the MNRF approved revisions to the "Development, Interference and Alteration" regulations for each conservation authority, which enable conservation authorities to control development through a permitting process in areas prone to water-related natural hazards, such as shorelines, river and stream valleys, floodplains, watercourses, and wetlands. The conservation authority permitting process is designed to deal with issues related to flooding, erosion, dynamic beaches, pollution and “conservation of land”.

Metrolinx is exempt from TRCA Regulations (i.e., O. Reg. 166/06). As such, Metrolinx is exempt from the TRCA regulatory approval process and is not required to apply for and obtain permits from the TRCA. However, the TRCA will be engaged on the Project through a Voluntary Project Review (VPR) process. The intent of this voluntary process is to adhere to TRCA’s requirements for regulated areas to the greatest extent possible as outlined below:

- Development of the Kirby GO Station will be adjacent to the TRCA’s regulated area. Metrolinx will submit Project information to the TRCA identifying the work to be undertaken within these regulated areas, in keeping with the spirit and intent of O. Reg. 166/06;
- The SWM Plan for the discharge of water and wastewater from the Project will be submitted in accordance with TRCA “Stormwater Management Criteria” (2012) and the MOECC SWM guidelines (2003) for TRCA review and comment. The SWM design will be submitted to the TRCA for conceptual and detailed design review and comment;
- As part of the SWM design submission, an ESC Plan will be submitted to TRCA for their review and comment in accordance with the “Erosion and Sediment Control Guidelines for Urban Construction” (2006). As per the Guideline, an ESC Plan is required in addition to the ESC Plan drawing(s);
- Any PTTW or EASR dewatering activity identified prior to construction will be provided to the TRCA for review and comment;
- Estimated tree removals are included in the NERs and the TIPs, provided in Appendix B and Appendix C of Volume 2 through Volume 6 of this EPR Addendum, respectively for TRCA review and comment. The NERs and TIPs were both completed in support of the BRCE EPR Addendum to detail how potential effects to terrestrial natural heritage features

(including individual trees) within the GO Station study areas will be avoided and/or mitigated during development of the Project; and

- In order to mitigate against canopy loss, and vegetative cover, and as part of an ongoing commitment, Metrolinx is currently finalizing the Vegetation Compensation Protocol for Metrolinx RER Projects. Once the Protocol has been finalized, consultation with key stakeholders including municipalities and Conservation Authorities will be undertaken, to discuss how the Protocol will apply to this Project. It will address items such as: tree and vegetation removal from within the ROW, from within woodlots, wetlands as well as trees immediately adjacent to Metrolinx-owned properties; compensation; and tree limb pruning protocols for construction. Vegetation that is removed will be compensated for in accordance with the provisions of this protocol, as discussed in Section 4.3.2.2.

6.3.2 Lake Simcoe Region Conservation Authority

As noted above, Metrolinx is exempt from the LSRCA Regulations (i.e., O. Reg. 179/06). Thus, Metrolinx is exempt from the LSRCA regulatory approval process and is not required to apply for and obtain permits from the LSRCA.

However, Metrolinx endeavours to minimize impacts to natural features protected by the LSRCA. The LSRCA will be engaged on the Project through a VPR process. The intent of this voluntary process is to adhere to LSRCA's requirements for regulated areas to the greatest extent possible as outlined below:

- Development of the Project will require working in LSRCA regulated areas for the Mulock GO Station site. Metrolinx will submit Project information to the LSRCA identifying the work to be undertaken within these regulated areas in keeping with the spirit and intent of O. Reg. 179/06 and all other LSRCA guidelines;
- For the Mulock GO Station specifically, Metrolinx will arrange a site walk of the study area with the LSRCA, and the MNRF to confirm the limits of any potentially impacted wetland and cultural meadow natural features. Additionally, a wetland assessment will be undertaken prior to construction to determine if the unevaluated wetlands meet current standards of a PSW;
- The SWM Plan for the discharge of water and wastewater from the Project will be submitted to LSRCA and reviewed in accordance with the LSRCA Watershed Development Policies (2012), and Lake Simcoe Protection Plan (LSPP) (2009). This SWM design will be submitted in accordance with the LSRCA Technical Guidelines for Stormwater Management Submissions (2013) and the MOECC SWM Guidelines. The SWM design will be submitted for conceptual and detailed design review and comment;
- As part of the SWM design submission, an ESC Plan will be submitted to LSRCA for their review and comment. As per the above LSRCA Technical Guidelines for SWM Submissions, ESC measures must be in accordance with ESC Guidelines for Urban Construction. See Section 4.3.1 above for further details;
- Any PTTW or EASR dewatering activity identified prior to construction will be provided to the LSRCA for review and comment;

- A watercourse crossing design submission for any new or replacement structures within LSRCA regulated areas will be provided to the LSRCA;
- Estimated tree removals are included in the NERs and the TIPs provided in Appendix B and Appendix C of Volume 2 through Volume 6 of this EPR Addendum, respectively, for LSRCA review and comment. The NERs and TIPs were both completed in support of the BRCE EPR Addendum to detail how potential effects to terrestrial natural heritage features (including individual trees) within the GO Station study areas will be avoided and/or mitigated during development of the Project; and
- In order to mitigate against canopy loss, and vegetative cover, and as part of an ongoing commitment, Metrolinx is currently finalizing the Vegetation Compensation Protocol for Metrolinx RER Projects. Once the Protocol has been finalized, consultation with key stakeholders including municipalities and Conservation Authorities will be undertaken, to discuss how the Protocol will apply to this Project. It will address items such as tree and vegetation removal from within the ROW, from within woodlots, wetlands as well as trees immediately adjacent to Metrolinx-owned properties; compensation; and tree limb pruning protocols for construction. Vegetation that is removed will be compensated for in accordance with the provisions of this protocol, as discussed in Section 4.3.2.2.

6.4 Municipal

Metrolinx, as a Provincial Crown Agency, is not generally subject to municipal permitting and approval requirements; regardless, Metrolinx works in co-operation with local municipalities to adhere to the intent of the relevant permit/approval requirements to the extent possible.

The five GO Station study areas for the Barrie rail corridor are located within six single-tier, upper-tier, and lower-tier municipalities. In the spirit of cooperation, the permit and approvals for consideration in this section also include information to be submitted to the applicable municipalities noted below, for comment:

- City of Toronto;
- York Region;
- City of Vaughan;
- Town of Newmarket;
- County of Simcoe; and
- Town of Innisfil.

Metrolinx will continue to communicate and engage with the above-noted municipalities throughout detailed design and prior to construction of the Project to confirm that any municipal concerns are addressed to the greatest extent possible prior to commencement of construction activities.

The following section identifies the municipal requirements for the Project. A summary is provided in Table 6-4.

Table 6-4: Summary of Municipal Permits and/or Approvals

Permit or Approval	Municipality
Building Permit	Applicable Municipalities
Site Plan Application	Applicable Municipalities
SWM, ESC and Dewatering Plans	Applicable Municipalities
Construction Permits	Applicable Municipalities
Road Occupancy Permits (with Traffic Control and Management Plans)	Applicable Municipalities
Tree Injury/Removal Permits	Applicable Municipalities
Zoning Approval	Applicable Municipalities
Municipal Water and Sewer Connections Applications	Applicable Municipalities

Submissions to the above noted permits/applications will be made in the spirit of co-operation and to provide the affected municipality with information and an opportunity to review and comment on the Project including:

- Building permit and Site Plan Applications;
- Stormwater Management (SWM) Plans for discharging water and wastewater including ESC and Dewatering Plans. In Simcoe County specifically, this review is undertaken by the LSRCA on behalf of the municipality;
- Construction works within or adjacent to the existing municipal road ROW or municipal park land including construction permits and road occupancy permits. Submittals shall include site-specific construction Traffic Control and Management Plans prepared to maintain reasonable access through the work zones;
- Tree removals and injury documentation, which will also include details related to tree preservation, protection, mitigation of injury and compensation, in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects; and
- Mitigation measures related to construction works near protected ravines and forests larger than 0.5 ha among other features through the City of Toronto's RNFP By-law (such as the eastern limits of the Earlscourt MUP bridge which is within the RNFP area associated with Earlscourt Park).

Metrolinx is not bound by municipal zoning by-laws and as such is not required to apply for and obtain zoning by-law amendments under Section 34 of the PA. However, Metrolinx will consult with municipal planning authorities throughout detailed design and prior to construction and comply with their requests where possible and reasonable. In addition, Metrolinx will coordinate with municipal staff to confirm the development plans for new or expanded infrastructure are constructed to meet municipal requirements to the greatest extent possible. Any effects to municipal ROWs and/or park properties will be discussed and confirmed with the affected municipality. Based on these discussions, Metrolinx will comply with the municipality's requests to the greatest extent possible.

6.4.1 Municipal Water and Sewer Connections

A Municipal Service Application will be prepared and submitted to the relevant municipality for any water and sewer connections required for the Project. This application is to be made in person and will include a Site Service Plan showing the location of required site services and invert elevations for review by the applicable municipality. The municipality will complete a pre-construction inspection and site meeting with Metrolinx to finalize the installation of water and sewer service. Subsequent to the connection being installed, a water turn on will be requested from the water authority.

Any discharge from dewatering to a City of Toronto sewer will be discharged in accordance with the applicable City of Toronto Sewer Use By-law:

- Spadina-Front GO Station – City of Toronto Sewers By-Law (Municipal Code, Chapter 681);
- Bloor-Lansdowne GO Station – City of Toronto Sewers By-Law (Municipal Code, Chapter 681);
- Kirby GO Station – York Region By-law 2011-56 (Discharge of Sewage, Storm Water and Land Drainage By-law), City of Vaughan Sewer Use By-Law 087-2016;
- Mulock GO Station – York Region By-law 2011-56 (Discharge of Sewage, Storm Water and Land Drainage By-law); and
- Innisfil GO Station– Neither Simcoe County nor the Town of Innisfil has a sewer use by-law.

6.4.2 Municipal Tree Legislation

The municipal legislation applicable to the Project is outlined in Section 3.4 of this EPR Addendum. Metrolinx is currently consulting with Conservation Authorities and municipalities to establish a Vegetation Compensation Protocol for Metrolinx RER Projects, described in Section 4.3.2 of this EPR Addendum.

6.5 Utilities

No permits or approvals are required. Future commitments related to utilities are in Section 7 of this EPR Addendum.

6.6 Transit Corporations

No permits or approvals are required. Future commitments related to transit are in Section 7 of this EPR Addendum.

7. Future Commitments

The future EPR Addendum commitments have been developed to satisfy the requirements of O. Reg. 231/08, and these will be carried out prior to, during and after Project construction. The potential effects and mitigation measures for the GO Stations have been identified, evaluated and assessed in the earlier sections of this EPR Addendum. It is anticipated that any changes to the design will not affect the original intent and commitments; however, these commitments

should be reviewed further throughout detailed design and prior to construction to confirm completeness.

Commitments to future work (including additional field investigations and targeted surveys) have been outlined in this section. These additional field investigations will be conducted during the detailed design of the Project when PTEs have been obtained for properties outside of the Barrie rail corridor. As part of future work, upon completion of these additional field investigations technical memorandums will be prepared and submitted to the MNRF.

An EMMP will be developed which will summarize potential environmental impacts or approval requirements that arise during completion of the detailed design and the additional environmental studies, as required. All the required permits and approvals for the GO Stations as contained with the EMMP will be obtained, and the EMMP will be updated once the permits and approvals are received, and/or findings from the additional environmental studies are available. Any additional mitigation measures or requirements, and any new monitoring or reporting requirements will also be included.

7.1 Summary of Future Commitments

Future commitments to be completed throughout detailed design and prior to construction, and during the construction phase of the GO Stations are identified in Table 7-1 and Table 7-2, respectively. These commitments mirror the EMMP structure and groups the future commitments as follows:

- Climate Change;
- Natural Environment:
  - Significant Wildlife and Terrestrial Environment;
  - Drainage and Aquatic Environment; and
  - Trees.
- Cultural Environment:
  - Archaeological Resources; and
  - Cultural Resources.
- Social and Built Environment:
  - Socio-Economic and Land Use Characteristics;
  - Air Quality, Noise, and Vibration; and
  - Traffic and Transportation Infrastructure.

Table 7-1: Summary of Future Design Commitments

Feature	Future Design Commitment
Climate Change	
Climate Change	Contractors will adhere to the GO Design Requirements Manual (DRM) during the design phase.
	A detailed SWM Plan will be developed prior to the construction phase of the Project so that runoff from rainfall is controlled based on predicted future scenarios, to promote climate resilience.
Natural Environment	
Significant Wildlife and Terrestrial Environment	Monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA.
	For the Mulock GO Station specifically, Metrolinx will arrange a site walk of the study area with the LSRCA, and the MNRF to confirm the limits of any potentially impacted wetland and cultural meadow natural features. Additionally, a wetland assessment will be undertaken prior to construction to determine if the unevaluated wetlands meet current standards of a PSW.
	Restoration Plans will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects and approved Landscape Plans will be developed prior to construction.
	Retain existing vegetation within the GO Station study areas to the extent practicable. Where avoidance is not possible, vegetation removal will occur in accordance with the timing windows; and any construction laydown areas or easements located within the Candidate or Confirmed Habitat of Endangered or Threatened Species will be subject to applicable requirements under the ESA. Timing windows will be developed in consultation with the MNRF.
	Adhere to relevant OPSS for clearing and grubbing (OPSS 201), site preparation and tree protection (OPSS 801, PROV).
	All work zones will be clearly marked on detailed design drawings and the ESC Plan to indicate that no work will occur outside the work zone.
	In wetlands: Where possible a setback from all developments of between 30-120 metres from all PSWs will be maintained. Setback distance will be determined through impact and mitigation analysis of individual wetlands and wetland components. All impacts, mitigation and proposed setback measures will be discussed with the LSRCA, the TRCA and MNRF. Wetlands will be restored as necessary to maintain the stability and function of the wetland and a compensation plan will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects and approved Landscape Plans developed prior to Project construction.
	In woodlands: Applicable TPZs will be established in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects; barriers will be installed around trees to be protected using material approved by the affected municipality; and no stockpiles, storage or disturbance to grade will occur within the TPZ to minimize soil compaction and root damage.
	Where habitats could not be identified due to access restrictions (i.e., reptile hibernacula, rare woodlands, seeps and springs), preconstruction surveys will be conducted. Any significant findings will be reported to the applicable municipality and conservation authority, and compensation will be addressed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.
	Compensation measures for habitats located within Natural Areas where habitats do not coincide with a Significant Natural Area will be developed, as appropriate. Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects.
	Detailed field surveys will be undertaken prior to Project construction by a qualified Ecologist to confirm the presence or absence of the following species and findings of field surveys will be reported to the MNRF: • Chimney Swift; • Bobolink; • Eastern Hog-nosed Snake; • Barn Swallow; • Eastern Small-footed Myotis; • Little Brown Myotis; • Northern Myotis;

Feature	Future Design Commitment
	• Tri-coloured Bat; • Barn Swallow; • Nancy hi; • Least Bittern; Bank Swallow; • Red-headed Woodpecker; • Wood Thrush; and • Eastern Meadowlark.
	For the Bloor-Lansdowne, Kirby and Mulock GO Stations, Butternut trees of all sizes (including seedlings) will be searched for at least 25 metres from the GO Station footprints (this search was previously conducted for the Spadina-Front GO Station). For the Innisfil GO Station, Butternut trees of all sizes (including seedlings) will be searched for at least 50 metres from the Innisfil GO Station footprint. Prior to any Butternut tree being removed or impacted as a result of the Project the Butternut tree must be assessed by a qualified Butternut Health Assessor. The Butternut Health Assessment should be undertaken in accordance with MNRF guidelines and results submitted to MNRF for review. The results of the Butternut Health Assessment will determine the next course of action, which may include no further requirement, submission of a Notice of Activity, or compensation and monitoring.
	During the detailed design phase, construction (including pre-construction land clearing) will be designed to avoid the loss of any Confirmed Habitat of Endangered or Threatened Species to the extent possible. Where loss cannot be avoided, the MNRF will be contacted and all requirements under the ESA will be met, including any species-specific registration, compensation and/or permitting requirements.
	A SMP will be prepared by a Qualified Professional as defined in O. Reg. 153/04 for managing soil materials on-site (includes excavation, location of stockpiles, reuse, and off-site disposal).
	Geotechnical studies will be completed prior to construction to identify any design and mitigation requirements in, and around, Valleylands.
Drainage and Aquatic Environment	The Kirby and Mulock study areas are within a WHPA-Q. As such, the TRCA (Kirby GO Station), the LSRCA (Mulock GO Station) and MOECC will be consulted during the detailed design phase of the Kirby GO Station with respect to Recharge Management and Demand.
	The LSRCA and MOECC will be consulted during the detailed design phase of the Mulock GO Station with respect to Recharge Management and Demand, as outlined in LSRCA Source Protection Plans.
	The TRCA Stream Crossing Guide will be followed during the detailed design phase for the Kirby GO Stations.
	Conduct a geomorphologic assessment study to determine the site appropriate erosion threshold at the Kirby GO Station as part of the SWM plan.
	For the Kirby GO Station specifically, once the Master Environmental Servicing Plan (MESP) for Block 27 is approved, the SWM criteria outlined in the MESP will be applied to the Project.
	All culverts, bridges and in-water structures will be designed to meet appropriate storm design requirements in order to avoid hydrologic affects.
	An ESC Plan and Dewatering Plan will be developed for each GO Station prior to construction and will conform to industry BMPs and recognized standard specifications. The ESC Plan shall also take into account the GGHACA ESC Guidelines for Urban Construction (2006) for the Spadina-Front, Bloor-Lansdowne and Kirby GO Stations and the Technical Guidelines for Stormwater Management Submissions (LSRCA, 2016) for the Mulock and Innisfil GO Stations. The ESC Plan will outline a process of resolving issues of extended encroachment, including clean-up, maintenance of ESC measures, and consideration of alternative ESC measures. All work zones will be clearly marked on detailed design drawings and the ESC Plan to indicate that no work will occur outside the work zone. Erosion and sediment control (ESC) measures will be implemented prior to Project construction and maintained during the construction phase in accordance with the ESC Plan.
	A Construction Emergency Response and Communications Plan will be developed prior to construction and followed throughout the construction phase (includes spill response and contingency plans).
	A Hazardous Materials and Fuel Handling Plan will be developed prior to Project construction, to confirm that fuels and other hazardous materials are handled and stored in a safe manner during the construction process. Hazardous material and fuel storage, refueling and maintenance of construction equipment will occur within designated areas only.

Feature	Future Design Commitment
	A Spill Prevention and Contingency Plan will be developed and will be in place prior to construction of the Project. Personnel will be trained in how to apply the plans and the plans will be reviewed on a regular basis to strengthen their effectiveness and facilitate continuous improvement. Spills or depositions into natural features will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. A hydrocarbon spill response kit will be on-site at all times during the work. Spills will be reported to the Ontario Spills action Centre at 1 800 268 6060.
	All requirements under the OWRA, R.S.O. 1990, c. O.40 with respect to water taking, management and discharge will be met, including applicable permits.
	An Aquatic Habitat Assessment Report will be prepared prior to construction to identify specific effects and mitigation measures associated with detailed culvert and bridge design plans. All in-water work will be conducted in accordance with the timing windows to be determined in the Aquatic Habitat Assessment Report.
	All requirements under the *Fisheries Act* will be met including any self-assessments or permitting. It is required that a self-assessment, according to DFO guidelines, be completed during later stages of detailed design for the Mulock GO Station, when the methodology for in-water works is better understood. This self-assessment will determine whether the Mulock GO Station will involve “serious harm” to fish. If it determined that serious harm will occur, or uncertainty exists, a Request for Review will be submitted to DFO, in addition to further consultation. Following submission of a Request for Review, DFO will determine whether authorization (i.e., approval) pursuant to the *Fisheries Act* is required.
	Detailed design plans will be submitted to the LSRCA/TRCA for VPR in order to confirm that all work is in compliance with O. Reg. 166/06 and O. Reg. 179/06.
	Hydrogeological studies will be completed to characterize existing soil and groundwater conditions that may impact soil management and disposal, dewatering and other aspects related to the construction of the Project.
Trees	An Arborist Report will be completed for all trees and shrubs (i.e., woody vegetation) that may be impacted by the GO Station infrastructure, including trees/shrubs to be preserved, removed or injured.
	Where loss of a retainable Butternut tree cannot be avoided, the MNRF will be contacted and all requirements under the ESA, 2007 will be met through the preparation of a Butternut Compensation Planting Plan.
	Further consultation with potentially impacted property owners will be undertaken when the detailed tree and shrub impacts are known.
	Timing windows for trees and shrubs that have been identified as part of the habitat of a SAR will be confirmed by the MNRF.
	Engage with the appropriate authorities, as necessary, to obtain all applicable permits and approvals.
Cultural Environment	
Archaeological Resources	All required AAs (Stage 2 and Stage 3 if recommended by the Stage 2AA) will be completed as early as possible, prior to the completion of detail design, and well in advance of any ground disturbance.
	Future work will be undertaken in a manner to protect archaeological sites by conserving them in their original location or through archaeological fieldwork, and endeavour to conserve significant archaeological resources in their original location through documentation, protection, and avoidance of impacts. Where activities could disturb significant archaeological resources or areas of archaeological potential, Metrolinx will take appropriate measures to mitigate impacts.
	Provisions in contract will be included as recommended by archaeological assessment(s) – e.g. in case archaeological resources are discovered, protection of sites.
	Areas determined to be undisturbed will be subjected to a Stage 2 AA in accordance with Section 2.1.2 of the 2011 S&G prior to construction activities to ensure no CHRs will be impacted (all GO Stations).
	Areas identified to contain deeply buried archaeological potential must be subjected to a Stage 2 AA in accordance with Section 2.1.7 of the 2011 S&G prior to construction activities (all GO Stations).
	As per the York Region Archaeological Management Plan, the predevelopment topsoil removal (stripping) within the Kirby study area is required of lands that are located within 1,000 metres of documented village sites and 300 metres of any current or former water source. This stripping shall occur after a Stage 2 AA and potential subsequent assessments have been conducted (Kirby GO Station).
	If final limits of the GO Stations are altered and fall outside the current study areas, an additional Stage 1 AA is required to assess the new footprint (all GO Stations).
	Cemetery investigations and a Stage 2 AA that also includes archival research on properties with known or potentially containing cemeteries will be completed. This applies to the following sites: • St Helens Roman Catholic Church (Bloor-Lansdowne GO Station).
Cultural Heritage Resources	CHERs (where recommended) will be completed as early as possible during the detail design phase and prior to completion of prior to completion of detail design.

Feature	Future Design Commitment
	Heritage Impact Assessment (HIA) (where recommended) will be completed in accordance with the S&Gs as early as possible during the detail design phase and prior to completion of detail design. The HIA will be developed in consultation with and submitted for review to MTCS and other heritage stakeholders (municipal planners and municipal heritage committee). The HIA will discuss the alternatives considered, and that all other alternatives to the removal and/or demolition have been considered and the best alternative has been adopted. The HIA will also make recommendations to minimize or mitigate adverse effects on the property resulting from the removal and demolition.
Social and Built Environment	
Socio-Economic and Land Use Characteristics	Metrolinx will confirm specific property requirements prior to Project construction to determine predicted property impacts.
	Metrolinx will engage and negotiate with affected property owners regarding land acquisition and easements/TLIs required for the proposed works, and provide fair market value compensation to affected property owners in accordance with applicable laws.
	Metrolinx will confirm potential conflicts with the proposed development applications and engage and negotiate with appropriate parties regarding land acquisition in advance of Project construction.
	Potential effects to utilities during construction should be confirmed through detailed design.
	Connection Applications will be submitted, as required, to the applicable utility companies for the purposes of any new services required along the Barrie rail corridor required for the GO Station sites. In addition to the hydro and gas service connections discussed below, connections may also be required for other services including telephone and communications to the various sites. Any excavation for utilities requires approval of a Municipal Consent Application (including applicable drawings that show where the utility will be placed) that gives permission to install new or move existing utilities and to carry out excavations within a municipal roadway.
	Connection Applications will be prepared and submitted to the relevant hydro provider (i.e., Toronto Hydro, Newmarket Hydro, InnPower and Hydro One) for any new hydro connections required for the Project. A Connection Cost Recovery Agreement will be required to secure funding and to contract for engineering, construction and commissioning work carried out by the hydro provider. Prior to connection, Metrolinx will enter into a Transmission Connection Agreement for ongoing operations with the applicable provider.
	Connection Application will be prepared and submitted to the relevant gas provider (i.e., Enbridge Gas and/or Union Gas) for any new gas connections required for the Project. A Connection Cost Recovery Agreement will be required to secure funding and to contract for engineering, construction and commissioning work carried out by the gas provider. Prior to connection, Metrolinx will enter into a Connection Agreement for ongoing operations with the applicable gas provider.
	A Municipal Service Application will be prepared and submitted to the relevant municipality for any water and sewer connections required for the Project. This application is to be made in person and will include a Site Service Plan showing the location of required site services and invert elevations for review by the applicable municipality. The municipality will complete a pre-construction inspection and site meeting with Metrolinx to finalize the installation of water and sewer service. Subsequent to the connection being installed, Metrolinx will request a water turn on from the water authority. Any discharge from dewatering to a municipal sewer will be discharged in accordance with the applicable municipal by-law.
	Metrolinx will continue to consult with affected parties prior to Project construction to further enhance and develop applicable mitigation measures for nuisance effects (i.e., noise, vibration, dust).
Air Quality, Noise, and Vibration	A communications protocol will be implemented to provide advance notification of construction works to affected persons to inform them of the timing and duration of construction activities including anticipated noise and vibration effects.
	The station public address system, ancillary systems, and any other stationary noise sources selected during final design shall be designed so that the one-hour equivalent sound level does not exceed the higher of the applicable exclusion limit value given in NPC-300, or the background sound level.
	An Air Quality Management Plan will be developed with specific attention given to monitoring dust levels during the construction phase and applying recommended mitigation measures to reduce the effects on the surrounding receptors.
	A construction Noise and Vibration Monitoring and Control Plan will be developed prior to construction. The plan will include a complaint response protocol and will indicate that surrounding property owners and tenants will be informed of anticipated upcoming construction works including any work at night.
	Mitigation measures will be investigated to reduce the noise effects at identified sensitive areas.

Feature	Future Design Commitment
	Mitigation measures will be investigated to reduce the vibration effects at identified sensitive areas.
	Wherever feasible, design suitable foundations for infrastructure that minimizes the need or extent of pile driving.
Traffic and Transportation Infrastructure	Metrolinx will ensure that the recommendations contained in the TTIAs (Appendix I of Volume 2 through Volume 6 of this EPR Addendum) are shared with the affected municipalities, for their consideration in mitigating traffic impacts.
	Recommendations to develop TDM strategies will be passed on to the planning and policy departments of the authority having jurisdiction.
	Recommendations regarding the maintenance and improvement of active transportation facilities in the TTIAs (Appendix I of Volume 2 through Volume 6 of this EPR Addendum) will be shared with affected municipalities for their consideration in enhancing active transportation connections in the GO Station study areas.

Table 7-2: Summary of Future Construction Commitments

Feature	Future Construction Commitment
Climate Change	
Climate Change	Contractors will adhere to the GO Design Requirements Manual (DRM) during the construction phase.
	Vegetation that is removed will be compensated for in accordance with the provisions of the Vegetation Compensation Protocol for RER projects.
	An ESC Plan will be development and implemented.
Natural Environment	
Significant Wildlife and Terrestrial Environment	If the ESC measures or dewatering measures are not functioning properly, no further work in the affected areas will occur until the problem is addressed. Erosion and sediment control (ESC) measures will be left in place until all areas within the construction site have been stabilized and will then be removed.
	Vegetation that is removed will be compensated for in accordance with the provisions of the Vegetation Compensation Protocol for Metrolinx RER Projects.
	All requirements under the ISA will be met.
Drainage and Aquatic Environment	Wet weather restrictions will be applied during site preparation and excavation. Work will be avoided in valleylands and watercourses during periods of excessive precipitation and/or excessive snow melt.
	The footprint of disturbed areas will be minimized to the extent possible. Vegetated buffers will be left in place adjacent to watercourses/waterbodies to the maximum extent possible.
	Hazardous material and fuel storage, refueling and maintenance of equipment will occur within designated areas only.
	All requirements under the OWRA, R.S.O. 1990, c. O.40 with respect to water taking, management and discharge will be met.
	Spills or depositions into natural features/areas will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. A hydrocarbon spill response kit will be on-site at all times during the work. Spills will be reported to the Ontario Spills Action Centre at 1 800-268-6060.
Trees	If determined that trees require pruning, trees shall be pruned in a manner that minimizes physical damage and promotes quick wound closure and regeneration. If earthworks are required immediately adjacent to a TPZ, and there is a potential to encounter roots, it is recommended that an exploratory exercise with an air spade be conducted.
	Prior to construction, a site meeting shall be held with the Contractor(s) and Contract Administrator to review the clearing limits and confirm the installation location for the tree protection barrier.
	Any tree clearing, or limb trimming will be limited to meet necessary safety clearances. Trees will be trimmed by a Qualified Professional to limit tree damage.
	Inspection of the tree protection barrier, including photographic records and deficiency notes, shall be undertaken by the site supervisor and submitted to the Contract Administrator prior to the commencement of construction, during construction and after construction is completed.
	All removals should be felled into the work area to ensure that damage does not occur to the trees within the TPZ. Upon completion of the tree removals, all felled trees are to be removed from the site, and all brush chipped. All brush, roots and wood debris should be shredded into pieces that are smaller than 25 mm in size to ensure that any insect pests that could be present within the wood are destroyed.
	Nest and nesting activity searches will be conducted in areas defines as simple habitat by a qualified Ecologist/Avian Biologist no more than 24 hours prior to vegetation removal. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by Atlas of the Breading Birds of Ontario (OBBA) criteria.
Cultural Environment	
Archaeological Resources	No construction activities shall take place within the GO Station study areas prior to the MTCS confirming in writing that all archaeological requirements have been met. In the event that archaeological remains are discovered during construction activities, the consultant archaeologists, approval authority and the MTCS should be notified immediately.

Feature	Future Construction Commitment
	Should deeply buried archaeological materials be encountered during construction, all work will cease, and a professionally licensed archaeologist will be consulted to assess the cultural heritage value and significance of the archaeological deposits.
Cultural Heritage Resources	Construction commitments will be defined through the required HIAs and implemented during construction.
Social and Built Environment	
Air Quality, Noise and Vibration	Construction BMPs will be utilized to mitigate potential air quality effects associated with the construction activities related to the GO Stations.
	Construction BMPs will be utilized to minimize any adverse effects from construction noise at nearby sensitive receptors.
	Construction BMPs will be utilized to minimize any adverse effects from construction vibration at nearby sensitive receptors.
	A DMP will be developed for construction. Dust suppression methods will be implemented as needed to control fugitive dust emissions in accordance with the publication “Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities” (Cheminfo Services Inc., 2005).
	Construction activities will be monitored by a qualified Environmental Inspector who will frequently review the effectiveness of the mitigation measures and construction BMPs to confirm they are functioning as intended. In the event that mitigation measures and/or construction BMPs are not functioning as intended (and are ineffective), the Contractor will be notified to implement revised mitigation measures/BMPs designed to improve their overall effectiveness. Dust levels will be monitored daily to assess the effectiveness of dust suppression measures, and adjust as required. Monitoring will continue throughout the construction phase until activities are complete, all exposed soils have been stabilized, and all construction waste has been cleaned up. A complaint response protocol for nuisance effects such as dust, will be established.
	A more detailed noise assessment of construction activities to be completed when the specifics of construction equipment are finalized, prior to construction start. This assessment will consider minimizing construction-related noise levels, while balancing construction schedules and expediting construction activity (Spadina-Front).
	Complying with the applicable municipal by-laws as they relate to construction activities and timing prohibitions. Scheduling activities that are expected to be particularly noisy during the day. Best efforts will be made to minimize impacts on neighbourhoods by limiting nighttime noisy activities. Notification of nighttime construction will be provided in advance.
Traffic and Transportation Infrastructure	Local transit should be notified well in advance of Project construction or road closures. All road closures due to Project construction should be coordinated with local transit to identify the best detour routes for transit vehicles, and to minimize transit travel time while maintaining a high LOS for transit users. Requirements to enact these mitigation measures during construction should be incorporated into the development of the Project Specific Output Specifications, and Project Agreement during future phases of Project development.
	Prepare and implement emergency response and incident management plans during construction to assist emergency service providers in response to incidents and emergencies.
	Development of a CTMP which will include providing pedestrian and cyclist access through work zones, alerting local transit of potential travel delays/service disruptions in advance of Project construction including road closures; identification of best detour routes for transit vehicles that minimizes travel time and service disruptions should be identified. The CTMP will be shared with relevant municipalities and transit authorities.

Table 7-3: Summary of Future Operations and Maintenance Commitments

Feature	Future Operations and Maintenance Commitments
Climate Change	
Climate Change	Appropriate ESC measures will be installed and monitored.
	LEED certification as required by the DRM, will include consideration of water conservation measures to reduce effects of drought on the Project, such as: • Metering indoor and outdoor water use to better track and manage the impacts of extended droughts on operations and landscape plantings; • Using water conserving systems to reduce consumption; and • Planting drought resistant vegetation.
Natural Environment	
Significant Wildlife and Terrestrial Environment	For the Kirby GO Station specifically, mitigation measures outlined in Best Management Practices for Mitigating the Effects of Roads on Amphibian and Reptile Species at Risk in Ontario (MNRF, 2016), will be applied as required (i.e.: tunnels) to minimize effect of amphibian and reptile road crossings.
	Spills or depositions into natural features/areas will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. A hydrocarbon spill response kit will be on-site at all times during the work. Spills will be reported to the Ontario Spills Action Centre at 1-800-268-6060.
	Any herbicide applications to clear vegetation within the GO Stations lands will be applied in accordance with industry BMPs and regulations.
	Any major maintenance work that would result in the replacement or upgrade of major infrastructure components requiring earth-moving work will be conducted in accordance with the applicable mitigation construction commitments.
Drainage and Aquatic Environment	All requirements under the OWRA, R.S.O. 1990, c. O.40 with respect to water taking, management and discharge will be met, including applicable permits.
	An Emergency Response and Communications Plan will be developed and followed throughout the operations and maintenance phase (includes spill response, contaminant management and contingency plans).
	Hazardous material and fuel storage, refueling and maintenance of equipment will occur within designated areas only.
Trees	Maintenance, seasonal pruning or removal may be required to prevent woody material falling onto the Barrie rail corridor, parking areas, or GO Station property. Pruning and felling will be carried out by or under the direction of an ISA Certified Arborist. Tree and shrub replacement may be required to compensate adjacent landowners if the condition of off-site Trees and shrubs deteriorates as a result of Project implementation, and compensation will be determined in accordance with the Vegetation Compensation Protocol.
Cultural Environment	
Archaeological Resources	N/A
Cultural Heritage Resources	N/A
Social and Built Environment	
Air Quality, Noise and Vibration	Operations and maintenance of the GO Stations will be carried out in accordance with applicable regulations and standards, including Ontario's AAQC (PIBS#6570e01) (MOE, 2016).
Traffic and Transportation Infrastructure	N/A

7.1.1 Future Consultation Commitments

The Notice of EPR Addendum is planned for Summer 2018 followed by a 30-day public, agency and Indigenous Communities Review and a subsequent 35-day Ministers Review. Comments and feedback will continue to be responded to an ongoing basis throughout the course of the Project. Comments and input from the public as part of the evaluation of potential environmental effects will be taken into consideration, through the detailed design stages of the Project. Reports will be distributed to Indigenous communities listed in Section 5.3 of this EPR Addendum, for comments and input to be taken into account through the detailed design stages of the Project. A Consultation Plan will be prepared at the commencement of each phase of the Project and will include, as applicable:

- Steps that will be taken to notify all stakeholders of major milestones, any Project amendments and other opportunities for comment;
- A system to allow and document public concerns, complaints and Metrolinx's responses; and
- Any additional regulatory consultation and notification requirements.

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