METROLINX

Barrie Rail Corridor Expansion Project
Transit Project Assessment Process
Environmental Project Report

August 8, 2017 - FINAL

HATCH *In Association with* BURNSIDE

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Issue and Revision Record					
Rev	**Date**	**Originator**	**Checker**	**Approver**	**Description**
0	2017-08-08	Tricia Radburn, M.Sc.(PI), MCIP, RPP Senior Environmental Planner	Mark Armstrong, M.E.Sc., P.Eng., PMP Deputy Project Manager - EA	Stephen Doris, P.Eng., MASCE Project Manager	Final
	Signatures:				

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Executive Summary

ES 1. Introduction

Metrolinx, an agency of the Province of Ontario, has proposed the expansion of the Barrie rail corridor and is evaluating the environmental effects of this transit project 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). The existing Barrie rail corridor is primarily a single track, approximately 63 miles in length, running from Union Station in the City of Toronto to Allandale Waterfront GO Station (Mile 63.00 Newmarket Subdivision) in the City of Barrie, shown in Figure ES-1.

The TPAP for the Barrie Rail Corridor Expansion Project (BRCE Project) includes the following infrastructure components:

- A second track between Lansdowne Avenue in the City of Toronto (Mile 3.00) to Allandale Waterfront GO Station in the City of Barrie (Mile 63.00)[12];
- 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 BRCE Project will be implemented in different phases. The first phase of the BRCE Project includes the corridor infrastructure components to support the GO Expansion program over the next 10 years. As such, Phase One includes:

- Detailed design and construction of a second track from Tecumseth Street in the City of Toronto (Mile 1.35) to Aurora GO Station (Mile 29.90)[3];
- Upgrades to the Rutherford, Maple, King City, and Aurora GO Stations; and
- Detailed design and construction of a new layover facility within the Town of Bradford West Gwillimbury for overnight train storage.

As additional funding becomes available from the Province, the next phase(s) of the Project will include the second track between Aurora GO Station and Allandale Waterfront GO Station and associated station upgrades.

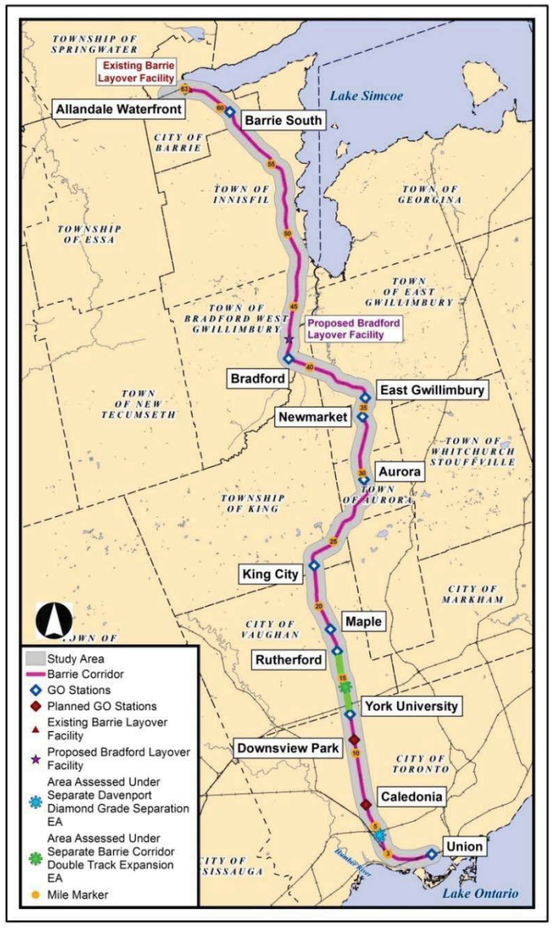


Figure ES-1: Barrie Rail Corridor Map

[1] *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 Davenport Diamond Grade Separation project which is being assessed under a separate TPAP and includes a double track only.*

[2] *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 Environmental Assessment (EA) (Barrie Corridor Double Track Expansion Project Summary Report, August 2014) and is not included as part of this TPAP.*

[3] *The portion of the corridor from Tecumseth Street (Mile 1.35) to Lansdowne Avenue (Mile 3.00) was assessed under a separate TPAP (Georgetown South Service Expansion and Union-Pearson Rail Link Environmental Project Report, July 2009), however the additional track work within this section has been included as part of the detailed design of Phase One of the BRCE Project.*

As part of Phase One of the BRCE Project, GO Expansion along the corridor over the next 10 years will include:

- All-day, two-way 15-minute service between Aurora GO Station and Union Station;
- Peak period, peak direction 30-minute or better service between Allandale Waterfront GO Station and Union Station;
- Off-peak, two-way 60-minute service or better between Allandale Waterfront GO Station and Union Station; and
- Electrification of the entire Barrie rail corridor[4].

ES 1.1 Corridor Overview

The Barrie rail corridor is owned by Metrolinx who operate a commuter (passenger) rail service between Union Station (Mile 0.00) and the Allandale Waterfront GO Station (Mile 63.00). Oriented generally in a north/south direction, the rail corridor is approximately 63 miles in length and has 10 stations (excluding Union Station). The corridor crosses a number of 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. Bus service is available for off-peak hours at all 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 within the Barrie rail corridor.

ES 1.2 Study Area

The TPAP study limits cover 60 miles of the Barrie rail corridor from Mile 3.00 to Mile 63.00 and crosses the 11 municipalities identified in the corridor overview above. The study area for this TPAP is defined as follows:

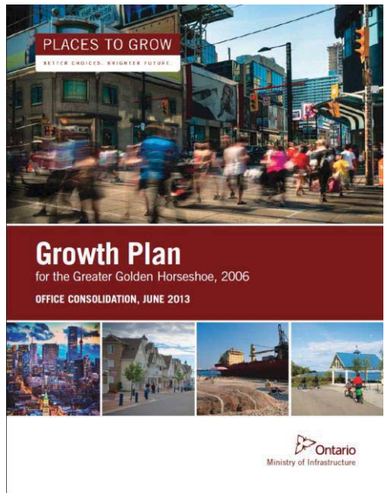
- All lands within the existing Barrie rail corridor Right-of-Way (ROW) within the TPAP study limits;
- All private property adjacent to the existing Barrie rail corridor ROW within the TPAP study limits that may need to be acquired to accommodate the second track, GO Station improvements (e.g., platforms, tunnels), and/or ancillary infrastructure (e.g., retaining walls). Includes all lands within the grading limits;
- All publicly owned road ROWs adjacent to the existing Barrie rail corridor ROW within the TPAP study limits that may need to be acquired to accommodate the second track, GO Station improvements (e.g., platforms, tunnels), and/or ancillary infrastructure (e.g., retaining walls); and
- The location of the future Bradford Layover Facility which is proposed to be located within the Artesian Industrial Park.

This Environmental Project Report (EPR) takes into consideration the study area for each of the supporting Technical Reports prepared as part of the BRCE Project. It is noted that within these supporting Technical Reports, an extended area of study may be included, and since it is dependent upon the distance from the ROW at which discipline specific effects are likely to be experienced, varies across disciplines and Reports.

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), Ministry of Municipal Affairs and Housing (MMAH), 2014;
- Growth Plan for the Greater Golden Horseshoe (Growth Plan), 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, 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

Numerous corridor-specific studies which support the BRCE Project have been completed prior to this Assessment, such as the Barrie Corridor Planning Study Final Report (Halcrow Consulting Inc. et al., 2012). The study recognized that in order for Metrolinx to implement GO Expansion service along the Barrie rail corridor within the next ten years, additional tracks, layover facilities, expanded station infrastructure, new trains, and new GO Stations would be required.

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

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

[4] *The electrification of the Barrie rail corridor is being assessed under a separate TPAP. As such, the GO Rail Electrification TPAP will address any electrification considerations for the corridor beyond the works proposed as part of the BRCE TPAP.*

- 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.

The location for each Station is identified in the Preferred Design Rail Corridor Plans (Drawings SK-C-001-SK-C-144) appended to this EPR. These new GO Stations have not been assessed as part of this TPAP and will be subject to an Addendum.

As part of the RER program, Metrolinx is developing a strategy to manage the anticipated increase in train volumes at level crossings including undertaking a variety of actions to ensure safety. Metrolinx is working with road authorities across the region to ensure all crossings meet or exceed Transport Canada regulations. The initial focus has been on discussions with municipalities in locations where projects are advancing. The next phase will include more detailed discussions with all municipalities about plans for crossing improvements and future grade separations, in the context of existing processes (e.g., Transport Canada regulations).

Metrolinx has evaluated 185 public road/rail crossings across the entire GO network as part of the GO RER initiative. The System-Wide Grade Separation Study (December, 2015) examined the following components:

- Road and rail traffic volumes (current and future Exposure Index);
- Existing conditions (roadways, transit use, queuing, safety);
- Technical considerations (geometry, constructability);
- Operations (service reliability, special road users);
- Community impacts (connectivity, land use, environment);
- Cost (construction, maintenance); and
- Alternatives (road closures, mitigation).

Crossings were categorized as high, medium and low priority. Safety considerations were reflected in the grade separation assessment representing 60% of overall result.

Metrolinx has developed a priority list (based on defined criteria) for addressing congestion and other concerns at existing at-grade rail/road crossings. It was necessary to develop a tiered approach to consider prioritization. Tier One for the Barrie rail corridor includes at-grade crossings with high and medium priority based on the 15-minute service area and an Exposure Index of over 200,000 by 2031.

As shared infrastructure, grade separations are partnership efforts and require municipal consultation and agreement. Discussions have been underway with York Region and the City of Toronto on the potential priority locations, including:

- Rutherford Road (Mile 16.83);
- McNaughton Road (Mile 18.49); and
- Wellington Street East (Mile 29.99).

A separate Municipal Class EA has been completed by York Region for the Rutherford Road grade separation and design is currently underway. Grade separations at McNaughton Road and Wellington Street East have not been assessed as part of this TPAP and will be subject to further assessment. The locations for each of these crossings is found in the Preferred Design Rail Corridor Plans (Drawings SK-C-001 - SK-C-144) appended to this EPR.

ES 1.4 GO Train Ridership

ES 1.4.1 Ridership Demand Forecast

The Barrie Corridor Planning Study Final Report (Halcrow Consulting Inc. et al., 2012) indicated "*The Barrie GO rail corridor line is expected to see continued demand increases over the (10 year) planning period, as long as transit services in the corridor continue to improve.*" The ridership increases are resultant of employment and population growth in York Region and the County of Simcoe. Forecasting from the study anticipates that ridership on the Barrie rail corridor will continue to increase as follows:

- 6,750 boardings during the A.M. Peak Period in 2010;
- 13,900 boardings during the A.M. Peak Period in 2021; and
- 16,000 boardings during the A.M. Peak Period in 2031.

The above forecasts helped identify the need for GO Expansion service along the Barrie rail corridor.

Future ridership and traffic forecasts have also been conducted and detailed as part of this Assessment. These are detailed in Section 1.1.4 of this EPR.

ES 1.5 Current and Future GO Train Service Levels

At present, commuter rail service along the Barrie rail corridor comprises the following:

Weekday Service:

- Five 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 for these trains is approximately 30 minutes. Two additional southbound trains run from the Maple GO Station to Union Station in the A.M. peak, creating approximately 15 minute headways between 7:00 A.M. and 8:00 A.M. south of the Maple GO Station;
- Seven 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 is 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 GO Station.

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.

To achieve a 15 minute, bi-directional service, the current peak service level of 14 trains per day will be increased over time as infrastructure on the Barrie rail corridor is upgraded and new rolling stock is added to the train fleet. Thus, three service levels have been analyzed as part of this Assessment as follows:

- Current: 14 diesel trains from Union Station to Allandale Waterfront GO Station in 2016;
- Future, Scenario 1: up to 36 diesel trains per day from Union Station to Aurora GO Station by 2021, which includes 20 diesel trains between Aurora and Allandale Waterfront GO Station; and
- Future, Scenario 2: up to 180 electric trains from Union Station to Aurora GO Station in 2025 and beyond, which includes 46 electric trains between Aurora and Allandale Waterfront GO Station[5].

Figure ES-2 illustrates the frequency of RER train service during peak period (weekdays) and illustrates the frequency of RER train service during off-peak period (midday, evening and weekend).

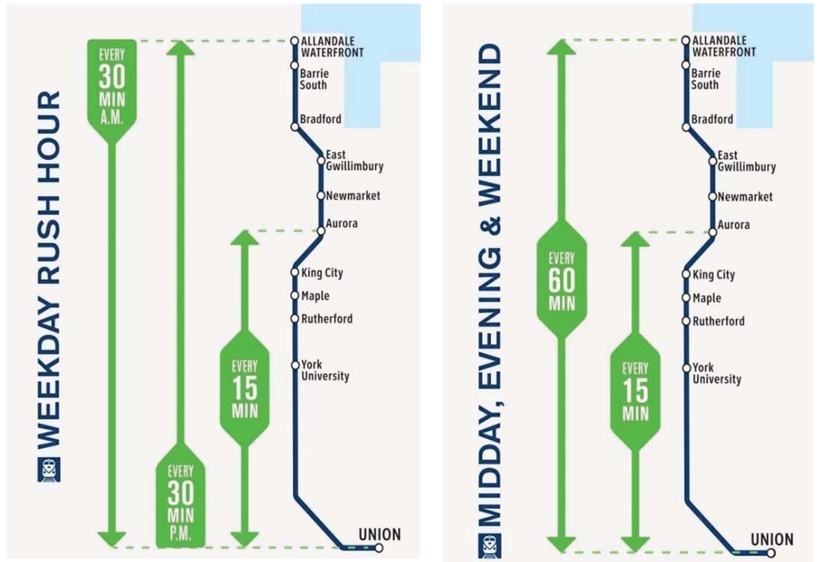


Figure ES-2: Future GO Barrie Service Plan[1]

[1] Peak Period: Weekday trains arriving at Union Station between 6:30 A.M. and 9:30 A.M. or departing from Union Station between 3.30 P.M. and 6:30 P.M.

ES 2. Project Purpose

Hatch in association with R.J. Burnside & Associates Limited (Burnside) was retained to complete this BRCE EPR in support of the TPAP. The purpose of the BRCE Project is to provide the required infrastructure to support the planned service improvements on the Barrie rail corridor. Once constructed, implementation of the GO Expansion service will improve service along the Barrie rail corridor and connections to the wider Greater Toronto and Hamilton Area (GTHA), providing people with improved transportation choices. Implementation of the BRCE Project will improve the GO Transit transportation experience and travel time reliability by providing faster, more frequent and less crowded transit and is expected to increase the proportion of trips taken by transit.

This Assessment reviews the need and justification for the BRCE Project, documents the existing conditions and constraints on the proposed Project, provides station and layover concepts and preferred design plans, details the predictable environmental impacts or effects and provides recommendations for addressing these effects through further study or mitigation.

ES 3. Transit Project Assessment Process

The TPAP is a focused process, governed by the Ontario Ministry of the Environment and Climate Change (MOECC) that recognizes and addresses the predictable environmental impacts and effects of transit projects. The TPAP creates an efficient plan that allows for project commencement, review and approval of the EPR (or Assessment) to occur within six months. The TPAP structure and timescale is illustrated in Figure ES-3. The TPAP is regulated by the EAA under O. Reg. 231/08. The Ontario Ministry of the Environment (MOE) guide entitled “Ontario’s Transit Project Assessment Process, January 2014” was closely referenced in carrying out the Assessment.

[5] *Assessed as part of a separate system-wide Electrification TPAP*.

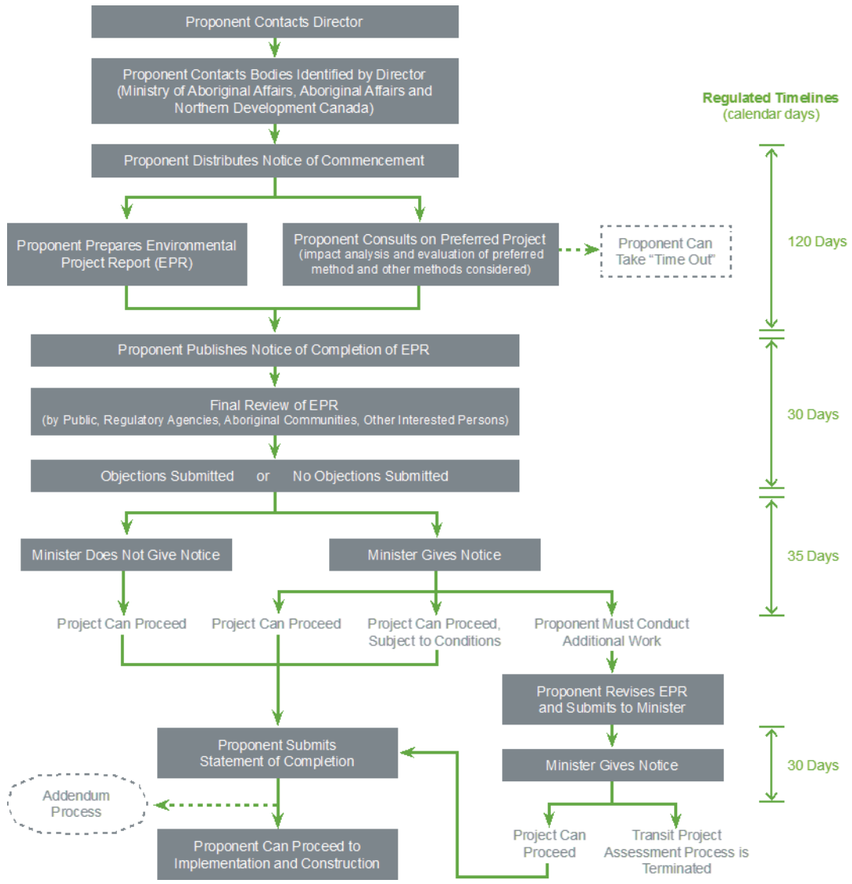


Figure ES-3: Transit Project Assessment Process

ES 4. Environmental Project Report Structure

As part of documenting the TPAP, this EPR has been organized into eight sections and includes supporting environmental and technical study reports (included as appendices), to address the requirements set out in O. Reg. 231/08. The EPR supports the planning and decision-making process followed during the course of the Assessment. The EPR summarizes the existing conditions within the study area and the potential environmental effects that could occur as a result of implementing the BRCE Project on the basis of the preferred design. The EPR also provides mitigation measures and monitoring activities to address these potential environmental effects. In addition, the EPR documents all stakeholder consultation efforts made by the BRCE Project team to engage and obtain input related to the BRCE Project from the public, regulatory agencies, Aboriginal communities, affected municipalities, and adjacent property owners.

In order to facilitate the review of this EPR 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 where they will find the components of the EPR that are established in the Guide to Ontario's Transit Project Assessment Process (MOE January, 2014).

Table ES-1: Concordance Table

EPR Requirement	Section of EPR Where Requirement is Addressed
A statement of the purpose of the transit project and a summary of background information relating to the transit project.	Section 1
The final description of the transit project including a description of the preferred method.	Section 2
A description of any other design methods that were considered once the project commenced the transit project assessment process.	Section 2
A map showing the site of the transit project.	Section 1
A description of the local environmental conditions at the site of the transit project.	Section 3
A description of all studies undertaken in relation to the transit project, including a summary of all data collected or reviewed and a summary of all results and conclusions.	Section 3, Section 4, Appendices A - I
The assessments, evaluation and criteria for any impacts of the preferred method and any other design method (described above) that were considered once the project's transit project assessment process commenced (does not include Pre-TPAP work).	Section 4
A description of any proposed measures for mitigating any negative impacts that the transit project might have on the environment.	Section 4
If mitigation measures are proposed, a description of the proposal for monitoring or verifying the effectiveness of the mitigation measures.	Section 4
A description of any municipal, provincial, federal, or other approvals or permits that may be required for the transit project.	Section 6
A consultation record, including: • A description of the consultations and follow up efforts carried out with interested persons, including Aboriginal communities.	Section 5, Appendix J

EPR Requirement	Section of EPR Where Requirement is Addressed
• A list of the interested persons, including Aboriginal communities who participated in the consultations. • Summaries of the comments submitted by interested persons including Aboriginal communities. • A summary of discussions with Aboriginal communities including discussions of any potential impacts of the transit project on constitutionally protected Aboriginal or Treaty Rights, and copies of all written comments submitted by Aboriginal communities. • A description of what the proponent did to respond to concerns expressed by interested persons including Aboriginal communities.	
If a "time out" was taken during the transit project assessment process, a summary of each issue including: • A description of the issue. A description of what the proponent did to respond to the issue and the results of those efforts. • The dates that notices for the "time out" were given to the Director, MOECC Environmental Approvals Branch (EAB), and the Regional Director (MOECC Central Region Office).	No time out required.

This EPR was submitted to the MOECC within 120 days of issuing the Notice of Commencement, to record and document the TPAP, including the conclusions reached, the potential environmental effects, the associated mitigation measures, and the future commitments for the BRCE Project. This EPR provides a comprehensive summary of each step in the Assessment. An outline and summary of the subject matter contained within each section of this EPR is provided below.

ES 4.1 Section 1 - Introduction and Study Process

This section of the EPR provides context for the BRCE Project, as generally described above.

ES 4.2 Section 2 - Project Description

This section describes in detail the proposed features of the BRCE Project that are necessary to support the planned service improvements on the Barrie rail corridor.

The preferred design associated with the second track is identified along with a summary of the design criteria for the proposed GO Stations and the proposed Bradford Layover Facility. Furthermore, this section outlines the outstanding issues that will be addressed prior to construction of the BRCE Project.

For civil and drainage works, a total of 180 culvert/bridge crossings were inventoried and evaluated through field inspections and structural surveys. Stormwater runoff within the rail ROW is to be managed with three conveyance system options that have been proposed herein and will be implemented as required.

Twenty-eight existing bridges that cross the Barrie rail corridor were inventoried, of which 15 will be affected by the Project. Several bridges and smaller structures, as well as the existing stations and their platforms are to be reconfigured to accommodate the second track expansion.

Preferred design plans for the GO Station improvements are provided herein and include provision of second platforms, shelters, vertical access, etc. The preferred design plan for the proposed Bradford Layover Facility is also included. During consultation with municipalities, the Town of Bradford West Gwillimbury (Town) provided additional feedback to Metrolinx on the proposed layover facility located on Artesian Industrial Parkway. The Town requested for Metrolinx to consider an alternative site located on the east side of the rail corridor at the Line 9 level crossing. Metrolinx is reviewing the alternative Line 9 Site and if determined to be feasible, further review, consideration and discussions with the Town of Bradford West Gwillimbury, Ministry of Natural Resources (MNRF), Lake Simcoe Region Conservation Authority (LSRCA) and other stakeholders will continue during the next phases of the Project.

Property requirements were identified to accommodate all aspects of the preferred design, including the proposed rail infrastructure, GO Station improvements, and the proposed train layover facility. Development of the BRCE Project will result in the need for Metrolinx to acquire approximately 25.65 ha of land to accommodate the new rail infrastructure. This includes approximately 0.06 ha of federal lands in Downsview Park. In addition, approximately 2.80 ha of land will be required to accommodate the GO Station improvements and approximately 9.64 ha of land will be required for the new Bradford Layover Facility.

The Project schedule is planned to continue from 2017 to 2023 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 study area as they relate to the natural, cultural, and social and built environments. The existing conditions are further organized and described according to the three main BRCE Project components, that is:

- Rail Infrastructure;
- GO Station Improvements; and
- Bradford Layover Facility.

ES 4.4 Section 4 - Impact Assessment of the Preferred Design

This section presents the assessment of potential environmental effects, associated mitigation measures, and future commitments for the BRCE 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. The impact assessment of the preferred design in this EPR is structured according to the following aspects and BRCE Project components:

- Climate Change;
- Rail Infrastructure;
- GO Station Improvements; and
- Bradford Layover Facility.

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 BRCE 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 BRCE Project.

ES 4.4.1 Climate Change

The effect of the BRCE 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 BRCE 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:

- The Bradford Layover Facility will aim to achieve Leadership in Energy and Environmental Design (LEED) Gold Certification, a certification system administered by the Canada Green Building Council;
- Implementation of the BRCE 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 BRCE 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), 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 BRCE 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 BRCE Project to ensure that runoff from rainfall is controlled.

An increase in storm intensity can make erosion and sedimentation more likely in the study area, especially during construction. Thus, Erosion and Sediment Control (ESC) measures will be implemented during the construction phase of the BRCE Project to ensure stormwater runoff entering area sewers and watercourses is not laden with sediment. The Greater Golden Horseshoe Area Conservation Authorities (GGHACA) Erosion & Sediment Control Guideline for Urban Construction (December 2006) will be followed to ensure the proper ESC measures are installed during construction and monitored during the post-construction period.

ES 4.4.2 Impact Assessment, Mitigation and Monitoring Plan

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

- Project Phase;
- Site/Location of Potential Effect;
- Feature;
- Description of Potential Effect;
- Mitigation Measure;
- Mitigation Responsibility;
- Net Effects;
- Monitoring Activity; and
- Monitoring Responsibility.

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 BRCE Project does not result in negative effects on matters of provincial importance related to the natural environment, properties of cultural heritage value or interest, or on constitutionally protected Aboriginal or Treaty Rights. 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 BRCE Project.

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, January 2014)).

Table ES-2: Matters of Provincial Importance

Matters of Provincial Importance[1]	Definition[2]	Applicability to the BRCE 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 BRCE study area.
Extirpated, Endangered, Threatened, or species of special concern and their habitat.	1) A species at risk (SAR): Extirpated, Endangered, or Threatened species and their habitat. 2) 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) (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 adjacent to the Barrie rail corridor that provide habitat for these species.
A wetland, woodland, habitat of wildlife or other natural heritage area.	1) A Significant Wetland, Significant Woodland, Significant Valleyland or SWH as defined in Section 2.1.5 of the PPS (2014). 2) A Natural Area Abutting Lake Simcoe as defined in policy 6.21-DP of the Lake Simcoe Protection Plan (LSPP).	There are portions of Significant Wetlands, Significant Woodlands, Significant Valleylands and SWH that will be removed as a part of the rail expansion. One Natural Area Abutting Lake Simcoe is present but will not be affected.
An area of natural or scientific interest (ANSI).	A Significant ANSI as defined in Section 2.1.5 of the PPS (2014).	There is one Significant ANSI and two Candidate ANSIs within the BRCE study area that may be affected by the BRCE Project.
A stream, creek, river or lake containing fish and their habitats.	A stream, creek, river or lake containing fish and their habitats.	There are a total of 46 watercourses that cross the BRCE rail corridor, of which 35 provide direct fish habitat and 11 provide indirect fish habitat. Two watercourses that cross through the Barrie rail corridor contain Redside Dace (fish SAR) habitat in the area of the crossing. One watercourse contains Redside Dace upstream of the rail corridor.
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.	Though there are a number of Wellhead Protection Areas (WHPAs) present along the Barrie rail corridor, there are no proposed activities related to the operation of the rail corridor that would constitute drinking water threats. Thus, no negative effects are anticipated. Construction-related mitigation has been identified.
Areas that may by impacted by a known or suspected on-site or off-site source of contamination such as a spill, a gasoline outlet, an open or closed landfill site, etc.	Areas that may by impacted by a known or suspected on-site or off-site source of contamination such as a spill, a gasoline outlet, an open or closed landfill site, etc.	A Phase 1 Environmental Site Assessment will be completed to ascertain if there are any known or suspected off-site sources of contamination. There is one former (closed) landfill site located within proximity to the Barrie rail corridor and the new Bradford Layover Facility.

Matters of Provincial Importance[1]	Definition[2]	Applicability to the BRCE Project
Protected heritage property.	Property designated under Parts IV, V or VI of the *Ontario Heritage Act*; property subject to a heritage conservation easement under Parts II or IV of the *Ontario Heritage Act*; property identified by the Province and prescribed public bodies as provincial heritage property 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.	Six properties protected under Part IV and one Heritage Conservation District protected under Part V of the *Ontario Heritage Act* were identified within the study area. Further study and construction-related mitigation has been identified.
Built heritage resources (BHR).	A building, structure, monument, installation or any manufactured remnant that contributes to a property's cultural heritage value or interest as identified by a community, including an Aboriginal community. Built heritage resources are generally located on property that has been designated under Parts IV or V of the *Ontario Heritage Act*, or included on local, provincial and/or federal registers.	In addition to the properties protected under Parts IV and V of the *Ontario Heritage Act*, there are also several properties listed under municipal heritage registries and identified as Protected Heritage Properties. One property is 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 cultural heritage value or interest 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 *Ontario Heritage Act*; 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 (e.g., 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 *Ontario Heritage Act*. The identification and evaluation of such resources are based upon archaeological fieldwork undertaken in accordance with the *Ontario Heritage Act*. 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 *Ontario Heritage Act* requires archaeological potential to be confirmed through archaeological fieldwork.	There are a number of known archaeological resources and areas with archaeological potential within the BRCE study area. These are being further investigated through Stage 2 Archaeological Assessments.
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 BRCE 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 Oak Ridges Moraine Conservation Plan (ORMCP) under the *Oak Ridges Moraine Conservation Act, 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 *Oak Ridges Moraine Conservation Act, 2001* applies.	The BRCE rail corridor traverses the Oak Ridges Moraine and there are portions of land designated as "natural core area" and "natural linkage area" that will be removed as a part of the rail expansion.
Property within an area described as a key natural heritage feature or a key hydrologic feature in the Protected Countryside by the Greenbelt Plan under the *Greenbelt Act, 2005.*	Property within an area described as a key natural heritage feature or a key hydrologic feature in the Protected Countryside by the Greenbelt Plan under the *Greenbelt Act, 2005.*	The BRCE rail corridor traverses the Greenbelt Area and there are portions of land identified as key natural heritage features that will be removed as a part of the rail expansion. Key hydrologic features will be identified prior to construction.

Note:

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

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

ES 4.5 Section 5 - Stakeholder Consultation Process

This section documents the stakeholder consultation process that occurred during the preliminary planning phase (Pre-TPAP) and during the TPAP, including input from various interested parties and Metrolinx's responses to feedback received.

Prior to initiation of the TPAP through the issuance of the Notice of Commencement, several activities were conducted in order to ensure the consultation process met all requirements under the TPAP. The purpose of the Pre-TPAP consultation was to identify stakeholders, introduce the BRCE Project and gather preliminary concerns and comments. The Pre-TPAP consultation was initiated in the spring of 2015, continued through the winter of 2017, and included:

- Consultation with the Director, EAB at the MOECC;
- Preparation of a Master Contact List;
- Establishment of a Project specific Website (Project Website);
- Convening Public Meeting #1 (November, 2015) in four communities within the study area and an Online Survey component;
- Convening a Public Meeting regarding the proposed train layover facility (July, 2016), within the Town of Bradford West Gwillimbury;
- Convening Public Meeting #2 (November, 2016) in five communities, held jointly with the GO Rail Network Electrification TPAP Project team and Metrolinx Planning;
- Indigenous engagement through identification of; and correspondence and meetings with, Indigenous communities that may have an interest in the Project;
- Convening TPAP briefs, preliminary meetings with elected officials, regulatory agencies; conservation authorities and potentially affected municipalities leading to creation of Technical Advisory Committees (TACs);
- Convening TAC meetings to provide an overview of public consultation efforts, present preliminary drawings and technical work, identify BRCE Project developments and obtain input on the BRCE Project;
- Convening TPAP and preliminary design meetings with potentially affected developers to identify private development projects and obtain input on the BRCE Project; and
- Circulating draft Technical Reports and the draft EPR to regulatory agencies, Indigenous communities, affected municipalities, and other stakeholders.

ES 4.5.1 Consultation with the Director

As required under O. Reg. 231/08, Metrolinx sent a letter to the Director, EAB at the MOECC, requesting a list of bodies that may assist in identifying Indigenous communities which may have an interest in the BRCE Project. The Ministry of Aboriginal Affairs (MAA), now Ministry of Indigenous Relations and Reconciliation (MIRR) was contacted through email correspondence and, the Aboriginal and Treaty Rights Information System (ATRIS) of Aboriginal Affairs and Northern Development Canada (AANDC), now Indigenous and Northern Affairs Canada (INAC), was referenced to further develop the list of Indigenous communities that may have an interest in the BRCE Project.

Through consultation with these regulatory agencies, a list of Indigenous communities, and organizations located within 100 kilometers of the study area was compiled. The list of Indigenous communities identified as potentially having constitutionally protected Aboriginal Rights, Treaty Rights or other interests in the BRCE Project was developed as follows:

- Mississaugas of Alderville First Nation;
- Beausoleil First Nation (Christian Island);
- Chippewas of Georgina Island First Nation;
- Chippewas of Mnjikaning First Nation (Rama);
- Curve Lake First Nation;
- Hiawatha First Nation;
- Huron-Wendat Nation;
- Kawartha Nishnawbe First Nation;
- Mississaugas of the New Credit First Nation;
- Mississaugas of Scugog Island First Nation;
- Mohawks of the Bay of Quinte;
- Moose Deer Point First Nation;
- Wahta Mohawks (Mohawks of Gibson);
- Karry Sandy-McKenzie, Coordinator William Treaties communities; and
- Métis Nation of Ontario (MNO).

Contact information was collected for those communities with a potential interest in the BRCE Project and included in the Master Contact List.

ES 4.5.2 Master Contact List

A Master Contact List was compiled consisting of regulatory agencies, conservation authorities, municipalities, Indigenous communities, and other stakeholders who may have an interest in the BRCE Project based on the proposed Project works and proximity to the Project. The Master Contact List was developed following initial consultations with the Director of the EAB, subsequent regulatory agency consultation and results of the ATRIS search. As well, affected municipalities within the Barrie rail corridor study area were contacted to obtain lists of addresses of property owners within 100 metres, measured from the existing ROW limit.

The Master Contact List was continually updated in response to Project feedback and stakeholder interest, and was used for the distribution of BRCE Project related notices throughout the Pre-TPAP and TPAP phases. As correspondence from stakeholders, regulatory agencies, conservation authorities, municipalities and Indigenous communities was received, the Master Contact List was used to track correspondence to confirm comments were considered and incorporated into the decision-making process for the BRCE Project.

ES 4.5.3 Project Specific Website

A Project Website (www.metrolinx.com/RERBarrie) was developed to provide an overview of the TPAP and BRCE Project information, and to keep the public informed of public meetings, provide summaries of public meetings as well as to afford them the opportunity to provide their respective comments. The Website was updated with Project information and notices throughout the TPAP.

ES 4.5.4 Stakeholder Consultation

Public Meeting #1

As part of the Pre-TPAP consultation, the first series of Public Meetings (Public Meeting #1) were held on four separate dates in November of 2015 within the BRCE Project study area including the City of Toronto, City of Vaughan, Town of Newmarket and City of Barrie. The purpose of Public Meeting #1 was to present information regarding Metrolinx's transportation goals, and background on the BRCE Project, while providing the public with an opportunity to comment on the Project.

The Notice of Public Meeting #1 included the four dates, locations, time and Project purpose. The Notice was posted in local newspapers and posted on Metrolinx's Website with messaging displayed on Metrolinx's Twitter feed. The Notice of Public Meeting #1 was delivered to all stakeholders on the Master Contact List and property owners in the Project Area, up to 100 metres from the rail corridor (measured from the limit of the ROW).

Based on comments received as a result of Public Meeting #1, noted concerns included noise, vibration, property impacts and safety at crossings. Details of the public meetings including a summary of issues/concerns and Project team responses are provided in the Public Meeting #1 and Online Consultation Summary Report which is included in Appendix J of this Report. The Public Meeting #1 and Online Consultation Summary Report can also be seen in it's entirely on the Project Website.

Online Participation Opportunity #1

In coordination with Public Meeting #1, an Online Survey was available from November 06, 2015 through December 08, 2015, which provided an opportunity for the public to participate in the BRCE Project planning. There were 915 online participants who responded to questions in the survey (914 participants completed the survey in English, one in French). Notification of the survey was sent by email to Metrolinx newsletter subscribers.

The most commonly raised issues/concerns by respondents was the need for expanded parking, and a concern that construction of additional stations (stops) would increase the overall commute length. Other issues/concerns raised included integration with local transit services, traffic congestion, service times, the increased cost of fares, safety at crossings/parking facilities, and the potential impacts on the natural environment, damage to property during construction, property value, and the need for property acquisition. A summary of issues/concerns raised and Project team responses are provided in Appendix J of this Report.

Proposed Train Layover Facility in the Town of Bradford West Gwillimbury – Public Meeting

As part of the Pre-TPAP consultation, a Public Meeting, including a presentation and Question and Answer Session, was held in the Town of Bradford West Gwillimbury on July 13, 2016. The purpose of the Proposed Train Layover Facility Public Meeting was to present information on the proposed train layover facility in the Town of Bradford West Gwillimbury as part of the BRCE Project as well as an update on plans to electrify the GO service and GO service expansion.

The Notice of the Proposed Train Layover Facility Public Meeting was published in the local Bradford West Gwillimbury newspaper and posted at several locations in the Town of Bradford West Gwillimbury and surrounding area, as well as in four GO Stations within proximity of the proposed train layover facility. The Notice was also posted on Metrolinx's Website with messaging displayed on the Metrolinx Twitter feed. Notice to regulatory agencies and potentially affected municipalities was issued by email messages on June 23, 2016. Notice to landowners with properties located within 100 metres of the proposed train layover facility was sent as a general ad mail (Canada Post drop). A direct mailing of the Notice was sent to property owners within 30 metres of the proposed train layover facility.

Metrolinx also contacted elected officials in the Town of Bradford West Gwillimbury, via email, to advise them of the Project and offer the opportunity to be briefed prior to the public meeting. A presentation was made to Town of Bradford West Gwillimbury Council members on June 14, 2016, in advance of the Public Meeting (July 13, 2016). A summary of the meeting and action items is provided in Appendix J of this EPR.

Common issues/concerns noted in the comment sheets received as a result of the Public Meeting and raised during the Question and Answer Session included train whistling/horns, availability of sufficient parking for expanded service, pedestrian/cyclist safety at the Bradford GO Station, property requirements, effect on property values and property acquisition/expropriation, and the future closure of the York University GO Station. A summary of the Public Meeting including issues/concerns raised and Project team responses is provided in the Public Meeting Summary Report; Proposed Train Layover in the Town of Bradford West Gwillimbury, provided in Appendix J of this EPR.

Public Meeting #2

As part of the Pre-TPAP consultation, the second series of public meetings (Public Meeting #2) was held on five separate dates in November of 2016, in five different locations within the BRCE Project study area including the City of Toronto, City of Barrie, Town of Newmarket, Town of Aurora, and City of Vaughan. Public Meeting #2 was held jointly with the GO Electrification TPAP Project team and Metrolinx Planning to share information and updates on the BRCE TPAP as well as other ongoing Metrolinx initiatives involving the construction of new electrification infrastructure (the GO Rail Network Electrification TPAP) and information on the RTP which guides the work being carried out to transform the transportation network in the GTHA, and provided the public with an opportunity to comment on the Project.

The Notice of Public Meeting #2 included the five dates, locations, time and Project purpose. The Notice was posted in local newspapers, posted in all GO Stations along the Barrie rail corridor and posted on Metrolinx's Project Website (www.metrolinx.com/RERBarrie and www.MetrolinxEngage.com) with messaging displayed on the Metrolinx Twitter feed and email messages to subscribers to GO Transit On the GO alert service.

The Notice of Public Meeting #2 was delivered to all stakeholders on the Master Contact List and property owners in the Project area, up to 100 metres from the rail corridor (measured from the limit of the ROW).

Online Participation Opportunity #2

Project information story boards and the materials presented at the Public Meetings were made available on the Metrolinx Project Website (www.metrolinx.com/RERBarrie) following the meeting for those interested in the BRCE Project but who were unable to attend the Public Meetings. Details were provided as to how those interested could provide their comments.

Input on the Project(s) was received during the comment period following the Public Meeting through the dedicated email address (RERBarrie@metrolinx.com) for the Project and through online comments sheets made available through a dedicated Website - Metrolinx Engage (www.MetrolinxEngage.com).

Based on the comments received as a result of the Public Meeting #2, noted issues/concerns included potential effects on property values and quality of life (e.g., noise, vibration) for residents in the vicinity of the corridor, the potential need for property acquisition, the lack of available parking at existing GO Stations or loss of parking due to Project construction, timing for increased level of service, the location of new GO Stations and the possible closure of existing stations, pedestrian and vehicle safety at crossings along the Barrier rail corridor, and the need to better integrate GO Transit with local public transportation services. A summary of the Public Meeting including issues/concerns raised and Project team responses, as of May 9, 2017, is provided in the Public Meeting #2 and Online Consultation Summary Report provided in Appendix J of this EPR and available on the Project Website.

General Public and Property Owner Correspondence

Comments were received from several property owners and the general public throughout the Pre-TPAP process, exclusive of public meetings. Correspondence generally included requests to be included on the Master Contact (or mailing) List and requests for Project information following public meetings. Other submissions were of a specific nature, noting questions/concerns related to the Project. Key themes of the comments included: trails and future trail connections and corridor crossings; impacts to future planned developments; safety associated with crossings; flooding; timing of studies; air quality concerns; increased cost of service; Public Meeting format and opportunities for additional events; closure of existing GO Stations and construction of new GO Stations; level of service and timing of additional service; coordination of service with local transit; concern with train whistle blowing; and impacts to property.

Written submissions from the general public and property owners and Project team responses are provided in Appendix J of this EPR. A summary of the key themes identified through this correspondence is provided in Section 5 of this Report.

Potentially Affected Developers

Metrolinx discussed elements of potential impacts and integration of proposed and future developments adjacent to the Barrie rail corridor during a meeting with the Cortel Group, who are coordinating the Sleeping Lion Draft Subdivision Plan in the Town of Innisfil (Alcona South) and correspondence with Jones Consulting, who are coordinating a development on Mapleview Drive in Barrie. Meeting minutes and correspondence are provided in Appendix J of this EPR.

Metrolinx Transit Expansion Meeting in York South-Weston

On February 6, 2017, Laura Albanese, Member of Provincial Parliament (MPP) for the riding of York South-Weston and the Minister of Citizenship and Immigration), hosted a public meeting for those who reside within the riding. The meeting was held at Charles E. Webster Public School in the Eglinton West neighbourhood from 6:30 P.M. – 8:30 P.M. Attendees first had a chance to sign-in and review the roll plans that were set up in the back of the room.

MPP Laura Albanese chaired the meeting, introduced Metrolinx staff who presented the BRCE and GO Rail Network Electrification TPAP projects, which was followed by a Question and Answer session. Approximately 40 residents attended the public meeting including Councillor Frank Di Giorgio. A good percentage of attendees reside on Treelawn Parkway. The main issues raised by attendees included concerns with receiving Project notifications, future train frequency and schedule, noise impacts, diesel emissions, vegetation removal (trees), impacts to property value, location of the future track, grade separation requirements at Castlefield Avenue, and Electrification infrastructure impacts. A detailed summary of the meeting and a copy of the presentation is provided in Appendix J of this EPR.

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

As part of the Pre-TPAP consultation phase, Metrolinx met with elected officials, regulatory agencies, conservation authorities and municipalities with jurisdiction within the Barrie rail corridor in the summer of 2015 and continued to meet throughout the Pre-TPAP phase. Initially, Metrolinx met with elected officials, regulatory agencies and municipalities on an individual basis to present an overview of the BRCE Project. Following these preliminary meetings, TACs were established by municipality and grouped by Region/County, and a series of TACs were held as the Project progressed. See Appendix J of this EPR for further details. Additionally, draft Technical Reports and the draft EPR were provided to the TACs for review and comment during the Pre-TPAP period. Consultation was primarily through meetings, however also included written correspondence to provide notification of Project information sessions and respond to Project specific questions received.

At each meeting, Metrolinx presented an overview of the BRCE Project status, reviewed preliminary plans and drawings and discussed issues of importance or concern with participants. Key themes of discussion included: grade separation and pedestrian crossings; property acquisition; track alignment; impacts to adjacent planned developments; new GO Station locations; station access and upgrades; service levels; noise and vibration considerations; physical impact of electrification; proposed train layover facility; impact to natural and cultural heritage features; and consultation and engagement activities.

Meeting dates and participating regulatory agencies and elected officials are listed in Appendix J of this EPR. Minutes were taken at each meeting and are provided in Appendix J of this EPR. A summary of the key themes of these meetings is provided in Section 5 of this EPR.

Review of Regulatory Agency, Conservation Authority and Municipal Correspondence

In addition to the meetings as described above, written correspondence was also received from elected officials, agencies and municipalities during the Pre-TPAP process. Correspondence was received from the MNRF, TRCA, MOECC and Transport Canada, Ontario Heritage Trust (OHT), and the Ontario Ministry of Transportation (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 Aurora and Newmarket, the County of Simcoe, and the Towns of Innisfil and Bradford West Gwillimbury, and the City of Barrie. Copies of correspondence is provided in Appendix J of this Report and generally included acknowledgement of receipt of Notice(s) as well as contacts or correspondence and TAC meeting participation. Key issues/concerns raised included: impacts to future planned developments or infrastructure improvements in the vicinity of the Barrie rail corridor, and property requirements; inquiries about whistling cessation process; recommendations for new GO Station locations; recommendations for grade separations; impact of electrification on existing and planned structures; improved integration with local transportation networks, including trail crossings; and consideration of Secondary Plans and other information. Written correspondence received from agencies and municipalities is provided in Appendix J and is summarized by key theme in Section 5 of this Report.

ES 4.5.5 *Indigenous Community Engagement*

Metrolinx engaged those Indigenous communities identified as having a potential interest in the BRCE Project by direct mail, courier and email correspondence, including BRCE Project Notices.

Follow up phone calls were placed to communities to confirm receipt of the initial BRCE Project Notices, ensure the community was aware of the opportunity to comment, assess the level and type of interest in the BRCE Project and inquire if they had any comments/questions, as well as establish how they wished to be engaged in the future. Follow up emails were sent to the communities following issue of draft Technical Reports for review (Stage 1 Archaeological Assessment and the EPR) to inquire if they had any comment or questions and confirm they were aware of the opportunity to also provide comment in the later Phase of the Project. Correspondence to and from Indigenous communities is provided in Appendix J of this EPR.

As a result of expressed interest from the Indigenous communities on all Metrolinx initiatives, Metrolinx arranged a meeting on May 26, 2016 with consultation liaisons from four Indigenous communities that are members of the Williams Treaties First Nations[6] to discuss the BRCE Project as well as other Metrolinx initiatives outside the scope of the BRCE Project TPAP. A second meeting was held with all seven Williams Treaties First Nation communities on July 18, 2016 to discuss Metrolinx projects including the BRCE Project. Metrolinx presentations at both meetings and minutes are provided in Appendix J of this EPR.

A summary of issues/concerns raised by Indigenous communities as a result of engagement efforts is as follows: acknowledgement of receipt of Notice(s); standards and methods for engagement; contact for correspondence; significant archaeological interests and requirements to be involved in archaeological investigations; requests for further Project information to determine the level of interest; request to include opportunities to raise awareness and general knowledge of Indigenous communities in Metrolinx projects and transit opportunities; consideration of opportunities for the employment and training of community members; and consideration of a GO Transit fare discount. More detail is provided in Section 5 of this Report. Full comments through correspondence and minutes of meetings and Project team responses are provided in Appendix J of this EPR.

ES 4.5.6 *Circulation of Draft Technical Reports and Draft Environmental Project Report to Regulatory Agencies, Conservation Authorities, Municipalities and Indigenous Communities*

Regulatory agencies, conservation authorities, Indigenous communities, and affected municipalities were provided with an opportunity to review the BRCE Project draft Technical Reports prior to commencement of the TPAP. Section 5 lists the regulatory agencies, conservation authorities, Indigenous communities, and municipalities to which draft Technical Reports were submitted for review. The review comments received along with the Project team responses are provided in Appendix J of this EPR.

ES 4.5.7 *TPAP Consultation Activities*

Following the Pre-TPAP period, the TPAP commenced upon the issuance of the Notice of Commencement on May 11, 2017. The Notice of Commencement included information about the BRCE Project and TPAP as well as how to provide comment. In order to inform the public, regulatory agencies, Indigenous communities and other interested persons of the initiation of the TPAP, a Notice of Commencement and Public Engagement #3 was posted in local Newspapers on May 11, 12, 18 and 19, 2017, In addition, Notices were also placed in all GO Stations along the Barrie rail corridor, emailed to subscribers to GO Transit On the GO alert service, posted on Metrolinx's Website (www.metrolinx.com/RERBarrie), Twitter feed and Facebook page, delivered to all stakeholders identified in the Master Contact List and property owners within 200 metres from the Barrie rail corridor. A copy of the Master Contact List can be found in the Stakeholder Consultation Report (Appendix J).

Public Engagement #3

Initiated with the Notice of Commencement, an Online Survey was available from May 11, 2017 through June 1, 2017, which provided an opportunity for the public to participate in the BRCE Project planning during the TPAP period. There were 170 online participants who responded to questions in the survey.

The most commonly raised issues/concerns by survey respondents was the need for express service and greater frequency of service, and concern about the impact of train noise (including horn/whistle noise) as a result of increased service. Other issues/concerns raised included potential effects on property and quality of life (e.g., noise, vibration, air quality) for residents in the vicinity of the corridor, a lack of available parking at existing GO Stations, a need to retain existing GO Stations or add new stations, the timeline for construction and implementation of the BRCE Project, congestion and pedestrian/cyclist access at stations and connectivity with other local modes of transportation, a need to consider grade separations at crossings along the Barrie rail corridor, a need to address potential heritage impacts and impacts to the natural environment, a need for timely notification with broad distribution, and frequent updates to engage communities. A summary of the issues/concerns raised and Project team responses are provided in Appendix J of this Report.

Notice of Completion and EPR Review

The Notice of Completion of the TPAP will be published in local newspaper on August 10 and August 17, 2017. The Notice of Completion will also be placed in all GO Stations along the Barrie rail corridor, emailed to subscribers to GO Transit On the GO alert service, posted on Metrolinx's Project Website (www.metrolinx.com/RERBarrie), Twitter feed and Facebook page, delivered to property owners within a 200

[6] *The Williams Treaties First Nations are comprised of the Mississaugas of Alderville First Nation, Curve Lake First Nation, Hiawatha First Nation, Scugog Island First Nation, Chippewas of Beausoleil First Nation, Georgina Island First Nation and the Rama First Nation. The traditional territories of the Williams Treaties First Nations are located primarily in the Georgian Bay and Lake Ontario watersheds and includes certain principal tributaries and streams.*

metres radius from the rail corridor (measured from the limit of the ROW) and all stakeholders identified in the Master Contact List, which includes potentially interested and/or affected residents, anyone who has expressed an interest in the BRCE Project, regulatory agencies, conservation authorities, Indigenous communities and municipalities.

If a stakeholder (member of the public, regulatory agencies, conservation authorities, Indigenous community, or municipality, etc.) has concerns about the BRCE Project, they are welcome to submit objections to the MOECC Environmental Approvals Branch for the Minister to consider. Objections must be provided in writing and can only be submitted during the 30-day review period for the EPR, commencing at the issuance of the Notice of Completion. A copy should also be provided to the Director of the EAB and Metrolinx as the proponent. Information required for the objection must include:

- Contact information (including name, mailing address, organization or affiliation, phone number and email address (where possible));
- Proponent (Metrolinx) contact information (including name, address, phone number and representative/agency phone number);
- Brief description of the proponent's (Metrolinx) proposed undertaking, including location;
- Basis for why further study is required, including relevance to Aboriginal or treaty rights and matters of provincial importance that were not considered in the EPR; and
- Summary of how the objector has been involved in the consultation process (e.g., meetings, phone calls, emails, etc.).

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 the appropriate information can be found, or provide the missing information.

Following the 30-day review period, the Minister has 35 days to provide comment and decide whether the BRCE Project has a negative impact on matters of provincial importance or Aboriginal or treaty rights. At this point the Minister can approve the BRCE Project as planned, allow it to proceed subject to conditions; require the proponent to take further steps including further study or consultation; or choose to terminate the TPAP if they feel the EPR does not address these impacts.

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 identifies the permit, approval and agreement requirements that are anticipated to be required for the work activities associated with the BRCE 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 BRCE Project, which may lead to refinement or modification of the preferred design as described in this EPR.

To enable the potential environmental effects associated with the BRCE 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 Metrolinx is compliant with the commitments listed in this EPR, and to confirm the mitigation and monitoring measures identified herein are implemented and functioning in the manner prescribed;
- Undertake all additional studies/work as outlined in Sections 4 and 7, and Table 7-1 and Table 7-2 of this EPR 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. Secure all required permits/approvals prior to Project implementation;
- Implement all mitigation measures as documented in this EPR 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 BRCE EPR.

ES 4.9 BRCE TPAP Supporting Studies

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

Appendix A : Natural Environment Report;

Appendix B : Tree Inventory Plan and Arborist Report;

Appendix C: Stage 1 Archaeological Assessment;

Appendix D : Cultural Heritage Screening Report;

Appendix E : Cultural Heritage Evaluation Reports (CHERs), Statements of Cultural Heritage Value (SCHVs) and Heritage Impact Assessment (HIA);

Appendix F : Socio-Economic and Land Use Characteristics Report;

Appendix G : Air Quality Study;

Appendix H : Noise and Vibration Impact Assessment;

Appendix I : Traffic Impact Analysis; and

Appendix J : Stakeholder Consultation Report.

ES 5. Community Benefits

Communities along the Barrie rail corridor are subject to growth targets associated with the Growth Plan. In order to meet specific targets noted within the Growth Plan, land use changes and intensification are expected in a number of locations along the corridor, including a number of Secondary Plan Areas, and Regeneration and Intensification Areas.

Communities along the Barrie rail corridor and future growth areas will benefit from expanded commuter rail service. It is widely recognized that public transportation is a beneficial service that can:

- Improve the quality of life for local citizens by providing them with personal mobility and freedom by offering transportation options to get to work, school, healthcare centres, places of worship, and shopping opportunities, among others;
- Open access to new job opportunities for those who could not previously travel beyond their local neighbourhood;
- Reduce traffic congestion and reduce the need for new and expensive road infrastructure;
- Reduce carbon emissions and air quality concerns associated with automobile use;
- Improve community health by supporting walkable communities and decreasing respiratory health concerns due to air pollution; and
- Allow citizens to save money on gas, vehicles, vehicle maintenance, insurance and other automobile related costs.

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Glossary of Terms

AANDC:	Aboriginal Affairs and Northern Development Canada
AAQC:	Ambient Air Quality Criteria
ACIT database:	Ministry of the Environment and Climate Change internal database
ANSI:	Areas of Natural and Scientific Interest
APTA:	American Public Transportation Association
AREMA:	American Railway Engineering and Maintenance-of-Way Association
ASI:	Archaeological Services Inc. (ASI Archaeological and Cultural Heritage Services)
a.s.l.:	Above sea level
ATRIS:	Aboriginal and Treaty Rights Information System
B(a)P:	Benzo(a)pyrene
BHA:	Butternut Health Assessment
BMP:	Best Management Practice
BRCE:	Barrie Rail Corridor Expansion
Burnside:	R.J. Burnside & Associates Limited
CCTV:	Closed-circuit TV
CEAA:	*Canadian Environmental Assessment Act*
CFB:	Canadian Forces Base
CHER:	Cultural Heritage Evaluation Report
CHP:	Conditional Heritage Property
CHR:	Cultural Heritage Resource
CHRS:	Canadian Heritage Rivers System
CHSR:	Cultural Heritage Screening Report
CIP:	Community Improvement Plan
CLCL:	Canada Lands Company Limited
CNR:	Canadian National Railway
COSEWIC:	Committee on the Status of Endangered Wildlife in Canada
CPR:	Canadian Pacific Railway
CSP:	Corrugated Steel Pipe
CTA:	Canadian Transportation Agency
CTC:	Centralized Traffic Control
CUP:	Composite Utility Plan
CVC:	Credit Valley Conservation
CWS:	Canadian Wildlife Service
dBA:	A-weighted Decibels
DBH:	Diameter at Breast Height
DFO:	Fisheries and Oceans Canada
DNAPL:	Dense Non-Aqueous Phase Liquid
DRM:	Design Requirement Manual
EA:	Environmental Assessment
EAA:	*Environmental Assessment Act*
EAB:	Environmental Approvals Branch, Ministry of the Environment and Climate Change
EASR:	Environmental Activity Sector Registry
ECA:	Environmental Compliance Approval
ECCC:	Environment and Climate Change Canada
ECLRT:	Eglinton Crosstown Light Rail Transit
ELC:	Ecological Land Classification
EMMP:	Environmental Mitigation and Monitoring Plan
EPA:	*Environmental Protection Act*
EPR:	Environmental Project Report
ESA:	*Endangered Species Act (2007)*
ESC:	Erosion and Sediment Control
FTA:	Federal Transit Administration
GGH:	Greater Golden Horseshoe
GGHACA:	Greater Golden Horseshoe Area Conservation Authorities

Greenbelt Plan:	A 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 Greater Golden Horseshoe Growth Plan.
GHG:	Greenhouse Gas
Growth Plan:	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.
GS:	Grade Separation
GTA:	Greater Toronto Area
GTHA:	Greater Toronto and Hamilton Area
GTTA:	Greater Toronto Transportation Authority
HDF:	Headwater Drainage Feature
HIA:	Heritage Impact Assessment
HWIN:	Hazardous Waste Information Network
IBC:	Initial Business Case
IDF:	Intensity-Duration-Frequency
INAC:	Indigenous and Northern Affairs Canada
KHFs:	Key Hydrologic Features
KNHFs:	Key Natural Heritage Features
LEED:	Leadership in Energy and Environmental Design
L_{EQ}:	Equivalent Continuous Noise Level
LID:	Low Impact Development
LOS:	Level of Service
LRT:	Light Rail Transit
LSPP:	Lake Simcoe Protection Plan
LSRCA:	Lake Simcoe and Region Conservation Authority
MAA/MIRR:	Ministry of Aboriginal Affairs, now Ministry of Indigenous Relations and Reconciliation
MBCA:	*Migratory Birds Convention Act*
MBR:	Migratory Birds Regulations
MMAH:	Ministry of Municipal Affairs and Housing
MNO:	Métis Nation of Ontario
MNR/MNRF:	Ministry of Natural Resources/Ministry of Natural Resources and Forestry. The name of the Ministry of Natural Resources was changed to the Ministry of Natural Resources and Forestry in 2014. Thus, MNR and MNRF are considered to be synonymous for the purposes of this Report.
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.
MOECC/GO Draft Protocol:	"MOEE/GO Transit Draft Protocol for Noise and Vibration Assessment", January 1995
MOL:	Ministry of Labour
MOWT:	Maintenance of way track
MPIR:	Ministry of Public Infrastructure Renewal
MTCS:	Ministry of Tourism, Culture and Sport
MTO:	Ministry of Transportation
NAPS:	National Air Pollution Surveillance
NER:	Natural Environment Report
NHIC:	Natural Heritage Information Centre
NHRM:	Natural Heritage Reference Manual
NHS:	Natural Heritage System
NO_2:	Nitrogen Dioxide
NPA:	*Navigation Protection Act*
Oak Ridges Moraine Conservation Plan (ORMCP):	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.
OASD:	Ontario Archaeological Sites Database

OCS:	Overhead Catenary System
OGS:	Ontario Geological Survey
OHA:	*Ontario Heritage Act*
OHSA:	*Occupational Health and Safety Act*
OHT:	Ontario Heritage Trust
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
O. Reg.:	Ontario Regulation
ORM:	Oak Ridges Moraine
OTM:	Ontario Traffic Manual
OWRA:	*Ontario Water Resources Act*
PDP:	Parc Downsview Park Inc.
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
PHPPS:	Provincial Heritage Property of Provincial Significance
PPS:	Provincial Policy Statement 2014 - the statement of the government's policies on land use planning
PSW:	Provincially Significant Wetland
PTTW:	Permit to Take Water
PWQMN:	Provincial Water Quality Monitoring Network
QL-D	Quality Level D
RAQS:	Registry, Appraisal and Qualification System
RER:	Regional Express Rail
RMS:	Root Mean Square
RNFP:	Ravine and Natural Feature Protection
ROW:	Right-of-Way
RTP:	Regional Transportation Plan
RWDI:	Rowan Williams Davies and Irwin Inc.
S&G:	Standards and Guidelines for Consultant Archaeologists
SA:	Sensitive Area
SAR:	Species at Risk
SARA:	*Species at Risk Act*
SARO:	Species at Risk in Ontario List is the official list of endangered, threatened, special concern and extirpated animals and plants in Ontario
SCC:	Species of Conservation Concern
STEAM:	Sound from Trains Environmental Analysis Method
SUE:	Subsurface Utility Engineering
SWH:	Significant Wildlife Habitat
SWHTG:	Significant Wildlife Habitat Technical Guide
SWM:	Stormwater Management[7]
The Big Move:	A long range transportation plan created by Metrolinx for the Greater Toronto and Hamilton Area
TAC:	Technical Advisory Committee
TIA:	Traffic Impact Analysis
TLI:	Temporary Limited Interest
TDM:	Transportation Demand Management
TMP:	Transportation Master Plan
TPAP:	Transit Project Assessment Process
TPZ:	Tree Protection Zone
TRCA:	Toronto and Region Conservation Authority

[7] *Under the Ecological Land Classification System for Southern Ontario (Lee, et. al., 1998), SWM also refers to a mixed swamp vegetation community. Some references to SWM have this meaning in Sections 3.1.3 and 3.2.3 of this Report.*

TRSPA:	Toronto Region Source Protection Area
TS:	Typical Section
TTC:	Toronto Transit Commission
TYSSE:	Toronto-York Spadina Subway Extension
UITP:	International Association of Public Transport
USRC:	Union Station Rail Corridor
WHPA:	Wellhead Protection Area
YRT:	York Region Transit

1. Introduction and Study Process

1.1 Project Overview

Metrolinx, an agency of the Province of Ontario, is working to transform the way the region moves by building a seamless, convenient and integrated transit network across the Greater Toronto and Hamilton Area (GTHA) and surrounding communities. The Government of Ontario is committed to bringing more service to the GO rail network over the next ten years. This new service will bring frequent two-way, all-day train service 7 days a week to the Barrie rail corridor. The environmental impacts of the proposed Barrie Rail Corridor Expansion Project (BRCE Project) has been assessed 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).

1.1.1 Corridor Overview

The Barrie rail corridor is owned by Metrolinx who operate a commuter (passenger) rail service along the Newmarket Subdivision between Union Station (Mile 0.00) and the Allandale Waterfront GO Station (Mile 63.00). Oriented generally in a north/south direction, the existing rail corridor is primarily a single track, approximately 63 miles in length and includes 10 stations (excluding Union Station). The corridor runs through eleven 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, Towns of Aurora, Newmarket, East Gwillimbury, County of Simcoe, Towns of Bradford West Gwillimbury and Innisfil, and the City of Barrie. The Barrie rail corridor map is illustrated in Figure 1-1.

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 the York University GO Station in the City of Toronto. There are also infrequent Canadian National Railway (CNR) freight and VIA Rail services operating within the Barrie rail corridor.

1.1.2 Study Area

The TPAP study limits covers 60 miles of the Barrie rail corridor from Mile 3.00 to Mile 63.00 and crosses the eleven municipalities noted in Section 1.1.1. The study area for this TPAP is defined as follows:

- All lands within the existing Barrie rail corridor Right-of-Way (ROW) within the TPAP study limits;
- All private property adjacent to the existing Barrie rail corridor ROW within the TPAP study limits that may need to be acquired to accommodate the second track, GO Station improvements (e.g., platforms, tunnels), and/or ancillary infrastructure (e.g., retaining walls). Includes all lands within the grading limits;
- All publicly owned road ROWs adjacent to the existing Barrie rail corridor ROW within the TPAP study limits that may need to be acquired to accommodate the second track, GO Station improvements (e.g., platforms, tunnels), and/or ancillary infrastructure (e.g., retaining walls); and
- The location of the future Bradford Layover Facility which is proposed to be located within the Artesian Industrial Park.

This Environmental Project Report (EPR) takes into consideration the study area for each of the supporting Techncial Reports prepared as part of the BRCE Project. It is noted that within these supporting Technical Reports, an extended area of study may be included, and since it is dependent upon the distance from the ROW at which discipline specific effects are likely to be experienced, varies across disciplines and Reports.

It should be noted that the Barrie rail corridor mile marker references included within this EPR are based on the Metrolinx Barrie rail corridor track schematic and official mile markers for road crossings, stations, structures and culverts. All other locations where there is not an official mile marker are approximate mileage references relative to the Barrie rail corridor track schematic.

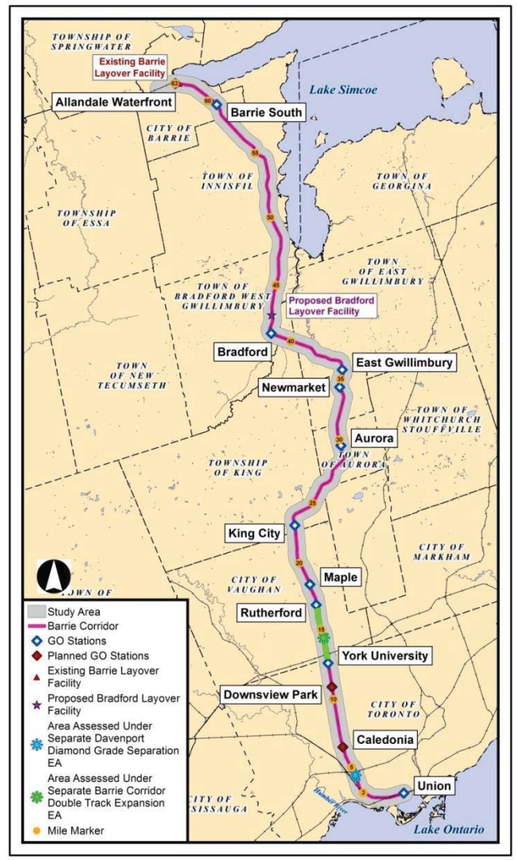

Figure 1-1: Barrie Rail Corridor Map

1.1.3 Background and Project Rationale

As part of the GO service expansion, the Barrie corridor will provide electrified[8], all-day, two-way service every 15 minutes to the Aurora GO Station as well as regular peak, midday, evening and weekend train service to the Allandale Waterfront GO Station. This service will be phased in over 10 years while Metrolinx builds additional infrastructure.

To support this vision, the TPAP for the BRCE Project includes the following infrastructure components:

- A second track between Lansdowne Avenue in the City of Toronto (Mile 3.00) to Allandale Waterfront GO Station in the City of Barrie (Mile 63.00)[9][10];
- 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 train layover facility within the Town of Bradford West Gwillimbury for overnight storage of trains.

The BRCE Project will be implemented in different phases. The first phase of the BRCE Project includes the corridor infrastructure components to support the GO Expansion program over the next 10 years. As such, Phase One includes:

- Detailed design and construction of a second track from Tecumseth Street in the City of Toronto (Mile 1.35) to Aurora GO Station (Mile 29.90)[11];
- Upgrades to the Rutherford, Maple, King City, and Aurora GO Stations; and
- Detailed design and construction of a new train layover facility within the Town of Bradford West Gwillimbury for overnight train storage.

As additional funding becomes available from the Province, the next phase(s) of the Project will include the second track between Aurora GO Station and Allandale Waterfront GO Station and associated station upgrades.

The following service level scenarios were assessed as a part of this TPAP:

- Current: 14 diesel trains per day from Union Station to Allandale Waterfront GO Station in 2016;
- Future, Scenario 1: up to 36 diesel trains per day from Union Station to Aurora GO Station by 2021, which includes 20 diesel trains between Aurora and Allandale Waterfront GO Station; and
- Future, Scenario 2: up to 180 electric trains from Union Station to Aurora GO Station in 2025 and beyond, which includes 46 electric trains between Aurora and Allandale Waterfront GO Station[12].

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

- Spadina (at Front Street) in the City of Toronto;
- Bloor-Davenport (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.

The location for each proposed new GO Station is identified in the Preferred Design Rail Corridor Plans (Drawings SK-C-001 - SK-C-144) appended to this EPR. Public consultation for all new GO Stations in collaboration with the municipalities will be part of the next phase of the GO Regional Express Rail (RER) program. New GO Stations have not been assessed as part of this TPAP and are subject to an Addendum.

1.1.3.1 Planning Context

There are a number of key planning policies and documents that support the rationale for the BRCE Project, as detailed in the following sections.

Provincial Plans and Policies

Since 2001, the Province of Ontario has approved a series of initiatives, statutes and plans that have profoundly changed the way planning and development is to occur within Ontario. A number of these specifically address transportation and public transportation. Public transit related developments shall be consistent with these policies.

Provincial Policy Statement

The Provincial Policy Statement (PPS), Ministry of Municipal Affairs and Housing (MMAH), 2014 provides general policies on land use management, infrastructure, resource management, economic prosperity and public health and safety that guide development across Ontario. The PPS (2014) encourages the development of compact, mixed-use communities connected by multi-modal transportation systems. The BRCE Project represents a significant component of a multi-modal transportation system, connecting local communities on a regional scale. It also supports many other policies outlined in the PPS (2014), including the facilitation of active transportation (e.g., walking, cycling, inline skating, and travel with mobility aids such as a motorized wheelchair) in and between residential, employment, institutional uses and other areas.

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[8] *The electrification of the Barrie rail corridor is being assessed under a separate TPAP. As such, the GO Rail Electrification TPAP will address any electrification considerations for the corridor beyond the works proposed as part of the BRCE TPAP.*

[9] *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 Davenport Diamond Grade Separation project which was assessed under a separate TPAP and includes a double track only.*

[10] *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 Environmental Assessment (EA) (Barrie Corridor Double Track Expansion Project Summary Report, August 2014) and is not included as part of this TPAP.*

[11] *The portion of the corridor from Tecumseth Street (Mile 1.35) to Lansdowne Avenue (Mile 3.00) was assessed under a separate TPAP (Georgetown South Service Expansion and Union-Pearson Rail Link Environmental Project Report, July 2009), however, the additional track work within this section has been included as part of the detailed design of Phase One of the BRCE Project.*

[12] *Assessed as part of a separate system-wide Electrification TPAP.*

Growth Plan for the Greater Golden Horseshoe

The Growth Plan for the Greater Golden Horseshoe (Growth Plan), Ministry of Public Infrastructure Renewal (MPIR), 2013 has been prepared under the *Places to Grow Act, 2005*. It provides a framework for building stronger, prosperous communities by better managing growth in the Greater Golden Horseshoe (GGH) region. The Growth Plan guides decisions on a wide range of issues including transportation, infrastructure planning, land-use planning, urban form, housing, natural heritage, and resource protection. Metrolinx's planning initiatives are part of a coordinated effort with the goals of the Growth Plan to help reduce congestion and create an integrated and efficient transit system in the GTHA.

Specifically, Section 3.2.3 of the Growth Plan indicates the following:

1. Public transit will be the first priority for transportation infrastructure planning and major transportation investments.
2. All decisions on transit planning and investment will be made according to the following criteria:
   a) Using transit infrastructure to shape growth, and planning for high residential and employment densities that ensure the efficiency and viability of existing and planned transit service levels;
   b) Placing priority on increasing the capacity of existing transit systems to support intensification areas;
   c) Expanding transit service to areas that have achieved, or will be planned so as to achieve, transit-supportive residential and employment densities, together with a mix of residential, office, institutional and commercial development wherever possible;
   d) Facilitating improved linkages from nearby neighbourhoods to urban growth centres, major transit station areas, and other intensification areas;
   e) Consistency with the strategic framework for future transit investments; and
   f) Increasing the modal share of transit.

The BRCE Project supports the above noted goals of the Growth Plan.

MoveOntario 2020 (Government of Ontario, 2007)

MoveOntario 2020 was a plan proposed by the Government of Ontario in 2007 to provide $17.5 billion in funding for 52 rapid transit projects throughout the GTHA. The plan included 902 kilometres of new or improved rapid transit, with 66% of the projects to be completed by 2015, and 95% of the projects to be completed by 2020. The BRCE Project represents two of the 52 projects included in MoveOntario 2020 (Government of Ontario, 2007a, 2007b). The Greater Toronto Transportation Authority (GTTA) was tasked with overseeing the entire project, finalizing the plan, and reporting back to the province in 2008. In 2008, MoveOntario 2020 was succeeded by "The Big Move", described below.

Ontario's Five Year Climate Change Action Plan 2016 – 2020 (Government of Ontario, 2016)

In June 2016, the Government of Ontario released its Five Year Climate Change Action Plan. It includes 28 actions spanning eight "Action Areas" to implement Ontario's Climate Change Strategy (Government of Ontario, 2015). The primary objectives of these two policy documents are to reduce Greenhouse Gas (GHG) emissions and transition to a prosperous low-carbon economy. Both documents identify the transportation sector as the largest GHG emitter in Ontario at 35%, followed by industry at 28% and buildings at 19%. As such, transportation represents a key Action Area to reduce GHG emissions. Specifically, five actions have been established for the transportation sector, one of which is to "Support the Accelerated Construction of the GO Regional Express Rail (RER)" (Government of Ontario, 2016).

As noted above, the GO RER requires a significant amount of infrastructure upgrades, and includes the BRCE Project as one of the "Next Wave" projects.

Metrolinx Policies and Programs

Regional Transportation Plan – The Big Move (Metrolinx, 2008)

In 2008, Metrolinx developed The Big Move, a Regional Transportation Plan (RTP) to address the mobility needs of Canada's largest urban region while reducing traffic congestion and providing an alternative to increasing automobile dependence. The Big Move was formed on the basis of the projects proposed in MoveOntario 2020. Significant improvements through investment in new and existing transit infrastructure are being carried out under the RTP. The RTP envisions a significant increase in the demand for rail service on the Barrie rail corridor over the next 15 to 25 years.

The GO RER requires a significant amount of infrastructure upgrades, and includes the BRCE Project as one of the "Next Wave" projects, as further described below. The Big Move outlined 13 goals and 37 objectives for regional public transportation. Relevant to the BRCE Project are the following objectives:

- Objectives 1-3, which are to provide transportation choices to give people a greater number of options for travel to a wide range of destinations. This includes providing options for seniors, children, those with special needs and others whose use of the automobile is limited;
- Objectives 4-7, which are to improve the transportation experience and travel time reliability by providing faster, more frequent and less crowded transit, improved information for people to plan their trips and a Region-wide integrated fare structure;
- Objectives 16-18, which are to increase the proportion of trips taken by transit, walking and cycling, to improve energy efficiency and reduce the use of out-of-province energy sources;
- Objective 26, which involves reducing delays and providing more seamless region-wide services for travellers through multi-modal transportation system integration; and
- Objective 27, which involves improving connections and service within the GTHA.

Strategic Plan: GO 2020 (GO Transit, 2008)

GO Transit is an operating division of Metrolinx, providing regional public transit service for the GTHA, with routes extending to communities across the GGH. Their Strategic Plan: GO 2020, is a commitment to meet the region's longer-distance public transportation needs in the coming decades, consistent with the Growth Plan (2005) and The Big Move (2008). GO 2020 presents a strategic direction to the year 2020, including their vision, objectives, goals, and service strategy. Together, GO 2020 and The Big Move will translate strategic vision and objectives into actions, including GO Transit's implementation of its components of The Big Move (GO Transit, 2008). GO

2020 identifies the BRCE Project as one of the necessary infrastructure upgrades required to achieve targeted service standards such as enhanced two-way, all-day rail service.

Investing in Our Region, Investing in Our Future (Metrolinx, 2013)

In May 2013, Metrolinx prepared an investment strategy titled “Investing in Our Region, Investing in Our Future”. This Metrolinx investment strategy proposes a series of 24 recommendations as part of a four-part plan to integrate transportation, growth and land use planning in the GTHA to maximize the value of public infrastructure investment, optimize system and network efficiencies and dedicate new revenue sources for transit and transportation (Metrolinx, 2013).

In support of The Big Move, the investment strategy proposed a “Next Wave” of projects requiring $34 billion in funding. The Next Wave projects would strengthen the regional network, further connecting various parts of the region, by optimizing the efficiency of the network (Metrolinx, 2013). The BRCE Project is included as one of the Next Wave projects as part of a strategy to enhance two-way, all-day service on GO rail lines in the GTHA.

GO Regional Express Rail (RER) Initial Business Case (Metrolinx, 2015)

An Initial Business Case (IBC) was developed in response to the commitment made by the Province of Ontario in 2014 to implement RER over a 10-year period (Metrolinx, 2015). The IBC was developed by a team of Metrolinx staff and consultants working collaboratively with the Ontario Ministry of Transportation (MTO) over a 12-month period, starting in April, 2014. The IBC describes how RER will transform five of the seven GO rail corridors into a service that operates all-day, every day, in both directions and with far greater frequency (Metrolinx, 2015). In order to thoroughly evaluate the business case of implementing RER, several scenarios were evaluated within the IBC:

- Scenario 1 (Do Minimum): Peak-focused limited capital with no electrification. This scenario was developed as the base scenario against which others are measured to determine relative performance;
- Scenario 2 (Two-Way All-Day): Enhanced diesel service on all corridors with no electrification;
- Scenario 3 (10-Year Plan): Frequent service on most inner corridors with limited electrification;
- Scenario 4 (Full Build/Beyond 10-Year Plan): Frequent service on all inner corridors with full electrification; and
- Scenario 5 (10-Year Plan Optimized): Frequent service on most inner corridors with significant electrification.

The recommended RER program within the IBC aligns most closely with Scenario 5; however, it is informed by multiple considerations from a variety of scenarios to obtain an optimal result (Metrolinx, 2015).

The IBC provides a comprehensive analysis that demonstrates how the system-wide transport benefits of implementing the recommended RER program exceed costs by a ratio of 3:1. As it relates to the BRCE Project, the Barrie rail corridor is identified as one of the five rail corridors to be transformed in the IBC, and is evaluated under Scenario 5 to have corridor-specific transport benefits exceeding costs by a ratio of 4:1 (Metrolinx, 2015).

RER is one of the largest infrastructure projects in North America. Metrolinx is transforming the GO rail network, the backbone of regional rapid transit, to relieve gridlock and provide a more convenient way to get around the GTHA. The following infrastructure will be implemented as a part of RER (see Figure 1-2).

Figure 1-2: Infrastructure Needs for GO Expansion

By increasing options and connecting transit networks, Metrolinx will change the way the entire GTHA moves. RER will benefit everyone in the GTHA by:

- Saving time for transit users with faster and more frequent transit service;
- Allowing customers to switch from car to train as a primary mode of transportation, resulting in costs savings, time savings, avoiding the stress of traffic congestion and allowing for greater productivity by using the time spent on trains to carry out other tasks;
- Providing road congestion relief for drivers, residents, and communities;
- Generating greater freedom for those who cannot or do not drive to move around through improved access to the entire GTHA; and
- Lowering the costs of lost productivity due to traffic congestion, which has been estimated at up to $11 billion per year.

To support these goals, RER will fast-track future service expansion with over 200 projects worth over $16 billion already underway. This includes significant work to update GO infrastructure that is the foundation of RER service.

Meeting the growing transportation needs of the region requires a pipeline of projects ready to be delivered and operated as funding becomes available. As noted above, these are referred to as the "Next Wave" projects; one of which is the BRCE Project. Figure 1-3 illustrates a number of Next Wave and RER projects within and across the Metrolinx GO Transit system network, including RER service for the Barrie rail corridor.

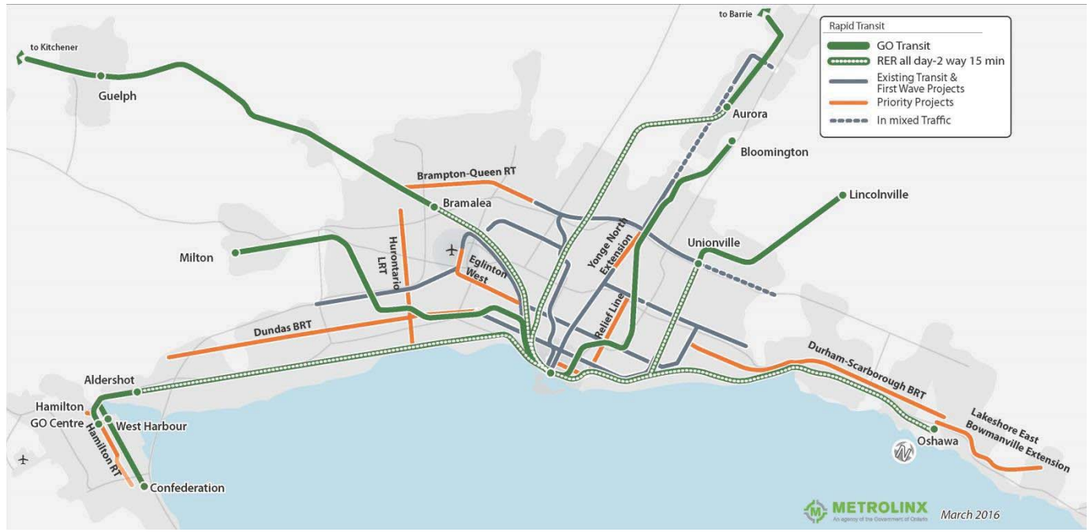

Figure 1-3: Rapid Transit Priority Projects

Metrolinx Sustainability Strategy 2015 - 2020 (Metrolinx, 2016)

Metrolinx has launched a Sustainability Strategy 2015 - 2020 that outlines five goals regarding how Metrolinx can plan, build, and operate to achieve meaningful progress towards sustainability. The RTP outlines the long term projects, plans, and activities Metrolinx will deliver to support Ontario's goal of reducing overall GHG emissions by promoting a shift from single-occupant vehicles to more energy-efficient options like walking, cycling, carpooling, and teleworking. The Sustainability Strategy builds on the RTP and Metrolinx's Five Year Strategy (2015-2020), focusing on ensuring that sustainability is embedded in the approaches, policies, and processes to deliver all identified projects, plans, and activities.

The sustainability vision for Metrolinx is to work together to reduce our impact on the environment and to enhance opportunities for communities. The Sustainability Strategy acts as a roadmap for Metrolinx to achieve this vision. The five goals of the Sustainability Strategy focus on five priority sustainability issues, which are most important to Metrolinx and its stakeholders, and represent areas of greatest need and opportunity. These include:

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 integrate sustainability criteria into our vendor management decisions.

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.

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.

These goals will be implemented through an approach based on people, systems, and performance management systems that ensure progress is measured and reported on to the public. Through the five goals, the Sustainability Strategy aligns and supports other current initiatives such as the Growth Plan (2005), the Regional Transportation Plan (2008), Ontario's *Infrastructure for Jobs and Prosperity Act* (2015), Ontario's *Climate Change Mitigation and Low-Carbon Economy Act* (2016), and Ontario's Climate Change Action Plan (2016-2020).

1.1.3.2 *Supporting Corridor-Specific Studies*

Numerous corridor-specific studies which inform the BRCE Project have been completed prior to this Assessment. A summary of relevant studies is provided below.

Barrie Corridor Planning Study

In 2012, Metrolinx completed the Barrie Corridor Planning Study Final Report (Halcrow Consulting Inc. et al., 2012), which was initiated as a background study with the understanding that it would lead to an EA for the corridor. The goals of the study were to:

- Determine the needs and justification of the expansion of services along the existing corridor;
- Present service plans associated with existing infrastructure and future expansion opportunities;
- Identify potential stakeholders and stakeholder issues;
- Prepare an accounting of operating costs and revenue associated with the expanded service; and
- Develop phasing and implementation strategies related to:
  - Land use intensification;
  - Transportation access; and
  - Station planning.

Estimates of future ridership were developed in order to determine what service improvements would be needed to meet future needs. The study noted, "*The Barrie GO rail corridor line is expected to see continued demand increases over the (10 year) planning period, as long as transit services in the corridor continue to improve.*" The ridership increases are primarily a result of employment and population growth in York Region, the County of Simcoe, and the City of Barrie.

The study concluded that the provision of additional GO service along the Barrie rail corridor is required to connect new residential growth areas to major employment and destination areas as well as major transit systems. More specifically, the forecasts established the need for all-day, two-way service on the existing Barrie rail corridor with

a provision for counter peak direction service during the A.M. and P.M. peak periods, bi-directional service during the midday/evening off-peak periods, and bi-directional service during the weekend off-peak period. The study identified three levels of Service Plans to help meet these demands: Immediate/Interim (0 to 5 years), Mid-term (5 to 10 years) and Mid to Long-term (10+ years). In addition, proposed service concept plans were identified for each scenario.

The Immediate/Interim horizon envisioned six trains making all stops between Union Station and the Allandale Waterfront GO Station in the A.M. and P.M., for a total of 12 trains per day along with hourly off-peak bus service available between Union Station and the Aurora GO Station. It was determined that these improvements could be implemented without the need for any EA approval process.

The study identified that for the Mid-term horizon, it was recognized that additional infrastructure would be required to service the estimated demands including double tracking from Parkdale Junction to the Aurora GO Station (which is being assessed as part of this TPAP) as well as improvements in the vicinity of the Davenport Diamond. The Davenport Diamond grade separation related work has been planned and assessed through a separate TPAP, for which the EPR was released in May 2016, and a Notice to Proceed was issued by the Ministry of the Environment and Climate Change (MOECC) on July 29, 2016.

The study identified that for the Mid to Long-term period, additional infrastructure in the form of double tracking to the Bradford GO Station would be required. The development of a triple track segment located between the King City and Caledonia GO Stations was also identified to facilitate express service. These improvements would affect station infrastructure at three existing GO Stations (King City, Maple and Rutherford), one relocated station (Downsview Park), one planned station, projected to open in 2020 (Caledonia), and one potential future GO Station (at Kirby Road in the City of Vaughan). The service plan also recognized the re-establishment of a layover facility and indicated further study would be required to determine the location and capacity of the facility.

The study recognized that in order for Metrolinx to implement GO Expansion service along the Barrie rail corridor within the next ten years, additional tracks, layover facilities, expanded station infrastructure, new trains, and new GO Stations would be required.

Bradford Corridor Planning Study

The Bradford Corridor Planning Study (Delcan, 2002) identified the need for additional track and other infrastructure required to implement the following incremental improvements to service levels on the Barrie rail corridor between the City of Toronto and Town of Bradford West Gwillimbury, as follows:

Existing Service Level (2002) - three peak direction trains in the A.M. and P.M. peak periods;

First Incremental Service Improvement - three additional peak direction trains in the A.M. and P.M. peak periods. The infrastructure required for this scenario included implementation of a bi-directional single-track signal system between Concord (Mile 15.50) and Bradford (Mile 42.00);

Second Incremental Service Improvement - implementation of limited bi-directional off-peak service. The infrastructure required for this scenario included construction of a rail/rail grade separation at the crossing of the CNR York Subdivision at Snider (Mile 12.90), installation of double track and Centralized Traffic Control (CTC) system from Snider (Mile 12.90) to the Aurora GO Station (Mile 29.90); and

Third Incremental Service Improvement (full service) - implementation of hourly off-peak service. The infrastructure required for this scenario includes construction of a rail/rail grade separation at the crossing of the Canadian Pacific Railway (CPR) North Toronto Subdivision at Davenport (Mile 4.60), and installation of double track and CTC signal system from the Aurora GO Station (Mile 29.90) to the East Gwillimbury GO Station (Mile 35.50).

Benefits Case Assessment

The GO Rail Options Benefits Case Assessment (Halcrow Consulting, June 2010) identified the need to add a second mainline track for the Barrie rail corridor, to allow for an increase in the number of trains to meet projected growth in ridership. In 2010, rail service extended to the Barrie South GO Station, however plans for the Allandale Waterfront GO Station in downtown Barrie had been approved, therefore the Allandale Waterfront GO Station was incorporated in the 'Do Minimum' scenario (report reviewed 'Do Minimum' and 'Do Something' scenarios) as the new terminal point. Current train service at the time was eight trains per day and the Benefits Case Assessment assumed service would grow to 39 trains per direction per day by 2021 and 43 trains per direction per day by 2031. For weekend service, it was assumed that there would be two trains per direction in each hour between 6:00 A.M. and midnight.

The ridership forecasts for the Barrie corridor in the Benefits Case Assessment were based on GO Rail's Direct Demand Model (peak period model) as well as forecasting of off-peak ridership based on information from the Lakeshore East and West corridors. Morning peak period ridership was forecast to increase from 6,400 in 2008 to 8,700 users/customers by 2021, and 10,800 users/customers by 2031 under the Do Something scenario, which included three new stations, higher frequency services and limited express service. Additionally, off-peak ridership (outside of the two peak periods) was expected to be about 76% of A.M. peak period ridership by 2021 or 2031, and weekend ridership was expected to be approximately 56% of total weekday ridership.

Estimates of the transportation user benefits from the provision of all-day service on the Barrie corridor (e.g., time savings, auto cost savings, safety benefits) were calculated and compared to the estimates of capital and operating costs for the associated infrastructure. It was determined there was a Benefit/Cost Ratio of 1.7:1, with significant positive benefits to the environment, the broader economy and society as a whole.

Passenger Survey

The GO Rail Passenger Survey Report (Metrolinx, 2014) is a biennial survey to monitor ridership, market trends, and commuter travel behaviour. The survey collects useful information about passengers, such as boardings (Ons) and alightings (Offs), trip origin and destinations, mode of travel to and from stations, socio-demographic characteristics, and other usage patterns. The most recent survey data available is from the 2013 GO Rail Passenger Survey Report (Metrolinx, 2014). The survey indicated that the purpose of trips for most GO passengers using the Barrie rail corridor is to commute to work, representing 95.3% of the trips.

The GO Rail Passenger Survey Report (Metrolinx, 2014) provides maps showing the ridership catchment areas for individual GO Stations, which provide a visual representation of the distribution of the GO user's origin locations. It also includes modal split information which has been used to inform the Traffic Impact Analysis (TIA) completed for this Assessment. The Traffic Impact Analysis is provided in Appendix I of this EPR.GO Station Parking Studies

The GO Transit Rail Parking and Station Access Plan (Steer Davies Gleave et al., 2013) provides additional planning assessment related to parking requirements throughout the GO Rail system. This study provided the following conclusions pertaining to the Barrie rail corridor:

- Ridership is forecast to increase from 7,600 to 13,500 riders (87%) between 2011 and 2031;
- The corridor currently has approximately 5,900 parking spaces at its stations;
- Investment in GO facilities should create a balance between the movement of pedestrians, cyclists and local transit to ensure safe and efficient movement to and through the stations, to promote more sustainable growth in rail ridership;
- The expansion of station parking is limited by land availability or by the development of parking structures (with higher operating and rehabilitation costs). The provision of transit connections to nearby residential neighbourhoods, or other major ridership-generating sites (e.g., employment areas, educational establishments, health care facilities), can provide a more cost effective means of providing station access. In this respect, the ability of the infrastructure to meet customer needs should be assessed within a 20 minute travel time of GO Transit rail stations;
- Several stations have high development potential, particularly the stations located in downtown areas;
- In the short term (1 to 5 years), improved transit connections are recommended to GO Transit Rail Service, as well as improvements to station infrastructure, including walking and cycling facilities, improved bus, Kiss & Ride and auto access/egress. The ability of the infrastructure to meet customer needs should be assessed within 1 km of the stations (walking infrastructure) and within 5 km (cycling infrastructure). Improvements may include modifications to pedestrian access (including lighting, covered walkways and maintenance); bicycle parking and cycling links to municipal routes; bus loop capacity and design enhancements and transit priority measures; redesign of Kiss & Ride; and improved wayfinding and signage for customers arriving by different station access modes. From 2014 to 2017, 2,000 to 2,500 additional parking spaces have been recommended on the corridor (at the Rutherford, Maple, King City and Newmarket GO Stations). Additional parking has not yet been constructed, however, as part of the GO Station improvements planned for the Barrie Corridor, parking expansion designs are being undertaken outside of the BRCE TPAP;
- In the medium term (5 to 20 years), opportunities should be investigated for integrating parking expansion into structured parking, as part of joint development (particularly at Mobility Hubs). A new station is proposed at Downsview Park in the City of Toronto, south of the York University GO Station;
- Parking expansion may be considered where the 12 month average parking occupancy rates exceed 90%, since this level of service may result in riders experiencing difficulty in finding parking spaces, thereby lengthening station access times and eventually suppressing rail demand;
- A traffic impact assessment should consider the ability of the local road network to accommodate increased vehicle traffic volumes accessing and egressing the stations' parking lots. Consideration should also be given to the effects and needs of all station access modes. If egressing vehicles are unable to clear the parking lot before the next train arrives, then improvements to other access modes should be considered before further parking expansion is delivered. Intelligent Transportation Systems may assist in improving the efficiency of traffic operations, provide pedestrians and cyclists with longer crossing periods, increased transit priority at junctions and reduce auto access and egress times;
- In the long term (20+ years), investment in surface parking expansion at the East Gwillimbury GO Station (200 to 600 spaces) may be required. Also, a potential station is possible between the Bradford and Barrie South GO Stations; and
- Targets related to access to the stations include:
  - Number of additional parking spaces for every ten additional riders is forecasted to decrease from 0.74 (2011) to 0.50 (2032);
  - System-wide automobile modal share for station access is forecasted to decrease from 67% (2008) to 50% (2032); and
  - Maximum walking time from station parking to platform should be five minutes (400 m).

The opportunity for improvement at the various GO Stations is considered within the context of the site-specific details for each station. The 2013 GO Transit Rail Parking and Station Access Plan Study summarized a number of these considerations.

GO ridership along the Barrie rail corridor has increased much faster than anticipated in the 2013 GO Transit Rail Parking and Station Access Plan, and many stations are already exceeding the 2031 ridership forecasts. The above noted inputs and issues are further considered in the TIA completed for this Assessment.

New Stations Analysis

Metrolinx identified an initial list of over 120 locations using site and system-wide network considerations. Through a focused analysis, the list was further refined to 50 locations based on service considerations, site factors, historical requests, and municipal and public engagement. A more detailed business case analysis was carried out to inform recommendations for new GO Stations as part of the GO RER Program.

New GO RER Stations for the Barrie Rail Corridor

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

- Spadina (at Front Street) in the City of Toronto;
- Bloor-Davenport (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.

The location for each proposed new GO Station is identified in the Preferred Design Rail Corridor Plans (Drawings SK-C-001 - SK-C-144) which are appended to this EPR. Public consultation for all new GO Stations in collaboration with the municipalities will be part of the next phase of the GO RER program. New GO Stations have not been assessed as part of this TPAP and will be subject to an Addendum.

Future GO Stations for the Barrie Rail Corridor

The Highway 7 – Concord station in the City of Vaughan (York Region) is not being included in the GO RER 10 year program at this time. However, the station may be considered for inclusion in the GO rail network in the future.

The Bathurst/Side Road 15 station in the Township of King (York Region) did not undergo initial business case analysis and is identified for future consideration in the context of longer term regional transportation planning.

Metrolinx will continue to work with municipalities to improve the strategic, economic, financial, and operations cases for these locations and bring them forward for consideration. Additional factors for consideration will include land use in the area that supports transit-oriented development and optimizes provincial transit infrastructure investments. Future GO Stations have not been assessed as part of this TPAP and will be subject to an Addendum.

Level Crossings

As part of the RER program, Metrolinx is developing a strategy to manage the anticipated increase in train volumes at level crossings including undertaking a variety of actions to ensure safety. Metrolinx is working with road authorities across the region to ensure all crossings meet or exceed Transport Canada regulations. The initial focus has been on discussions with municipalities in locations where projects are advancing. The next phase will include more detailed discussions with all municipalities about plans for crossing improvements and future grade separations, in the context of existing processes (e.g., Transport Canada regulations).

Further details on existing at-grade rail/road crossings, farm crossings and trails which cross the Barrie rail ROW are provided in Section 3.1.12 of the EPR and information on conditions at each of the individual crossings is provided in the TIA (Appendix I of this EPR).

System-Wide Grade Separation Analysis

Metrolinx has evaluated 185 public road/rail crossings across the entire GO network as part of the GO RER initiative. The study examined the following components:

- Road and rail traffic volumes (current and future Exposure Index);
- Existing conditions (roadways, transit use, queuing, safety);
- Technical considerations (geometry, constructability);
- Operations (service reliability, special road users);
- Community impacts (connectivity, land use, environment);
- Cost (construction, maintenance); and
- Alternatives (road closures, mitigation).

Crossings were categorized as high, medium and low priority. Safety considerations were reflected in the grade separation assessment representing 60% of overall result.

Metrolinx has developed a priority list (based on defined criteria) for addressing congestion and other concerns at existing at-grade rail/road crossings. It was necessary to develop a tiered approach to consider prioritization. Tier One for the Barrie rail corridor includes at-grade crossings with high and medium priority based on the 15-minute service area and an Exposure Index of over 200,000 by 2031. Internal Metrolinx review built on grade separation assessment results by considering additional factors for Tier 1 crossings:

- Status of project (e.g., planning, EA status, announcement);
- Existing municipal investment, commitment or interest;
- Operations;
- Constructability (e.g., Future impacts (e.g. proximity to stations, future development); and
- Future impacts (e.g., proximity to stations, future development).

As shared infrastructure, grade separations are partnership efforts and require municipal consultation and agreement. Discussions have been underway with York Region and the City of Toronto on the potential priority locations, including:

- Rutherford Road (Mile 16.83);
- McNaughton Road (Mile 18.49); and
- Wellington Street East (Mile 29.99).

A separate Municipal Class EA has been completed by York Region for the Rutherford Road grade separation and design is currently underway. Grade separations at McNaughton Road and Wellington Street East have not been assessed as part of this TPAP and are subject to further assessment. The locations for each of these crossings is found in the Preferred Design Rail Corridor Plans (Drawings SK-C-001 - SK-C-144) appended to this EPR.

Metrolinx will continue to work closely with its road authority partners and has initiated a process to ensure all crossings are upgraded, where required, to meet or exceed the new Transport Canada regulatory requirements.

Crossings on the network are designed and operated safely. For the at-grade crossings that are not being included in the GO RER 10 year program, a number of measures to support safe operation and additional actions will be implemented by Metrolinx, including:

- Enhancing safety of crossings and providing education in schools and communities with respect to safety and crossings;
- Working with road authorities to implement improvements for all crossings in accordance with Transport Canada regulations; and
- Exploring new technologies to enhance crossing safety.

1.1.4 GO Train Ridership

1.1.4.1 Current Ridership

As outlined in the TIA provided in Appendix I of this EPR, cordon count information from 2010 to 2014 for the Barrie GO rail service was reviewed to determine current ridership numbers and recent growth. Overall, the total number of daily boardings (Ons) and alightings (Offs) along the entire Barrie rail corridor grew by 70% between 2010 and 2014. The cordon count information also indicates that a number of trains are presently running over their seating capacity, as summarized in Table 1-1.

Table 1-1: Trains with Rider Demand Over Seating Capacity (Fall 2014)

Train	Direction	No. of Train Cars	% of Seating Capacity	Peak Load Location
No. 800	Southbound	10	101%	Rutherford to York University
No. 802	Southbound	10	125%	Rutherford to York University
No. 806	Southbound	12	129%	Rutherford to York University
No. 810	Southbound	12	102%	Rutherford to York University
No. 812	Southbound	10	101%	Rutherford to York University
No. 801	Northbound	6	106%	York University to Rutherford
No. 805	Northbound	10	136%	York University to Rutherford
No. 807	Northbound	12	111%	York University to Rutherford
No. 809	Northbound	10	114%	York University to Rutherford

1.1.4.2 Ridership Demand Forecast

As noted above, the Barrie Corridor Planning Study Final Report (Halcrow Consulting Inc. et al., 2012) indicated "The Barrie GO rail corridor line is expected to see continued demand increases over the (10 year) planning period, as long as transit services in the corridor continue to improve." The ridership increases are resultant of employment and population growth in York Region, the County of Simcoe, and the City of Barrie. Forecasting from the study anticipates that ridership on the Barrie rail corridor will continue to increase as follows:

- 6,750 boardings during the A.M. peak period in 2010;
- 13,900 boardings during the A.M. peak period in 2021; and
- 16,000 boardings during the A.M. peak period in 2031.

The above forecasts helped identify the need for GO Expansion service along the Barrie rail corridor.

Future ridership and traffic forecasts have also been conducted as part of this Assessment and are associated with the following service level scenarios:

- Current: 14 diesel trains per day from Union Station to Allandale Waterfront GO Station in 2016;
- Future, Scenario 1: up to 36 diesel trains per day from Union Station to Aurora GO Station by 2021, which includes 20 diesel trains between Aurora and Allandale Waterfront GO Station; and
- Future, Scenario 2: up to 180 electric trains from Union Station to Aurora GO Station in 2025 and beyond, which includes 46 electric trains between Aurora and Allandale Waterfront GO Station.

Future ridership forecasts were provided by Metrolinx for the 2029 A.M. peak period and Peak Hour for existing GO Stations, which was intended to represent the 2025 "Opening Day" conditions with GO Expansion service, and was considered as Future, Scenario 2 for this Assessment. Future, Scenario 1 forecasts were estimated by interpolating between current ridership and Future, Scenario 2 forecasts.

The A.M. Peak Hour forecasted ridership for the existing Barrie rail corridor GO Stations based on the above scenarios is summarized in Table 1-2 below.

Table 1-2: Barrie Rail Corridor Weekday A.M. Peak Hour Ridership Forecast for Existing GO Stations

	2015 (Current)		2021 (Future, Scenario 1)		2025 (Future, Scenario 2)	
GO Station	**Boardings**	**Alightings**	**Boardings**	**Alightings**	**Boardings**	**Alightings**
York University	32	165	58	226	82	242
Rutherford	1,121	22	1,723	33	2,456	49
Maple	1,701	2	2,108	2	2,811	-
King City	444	1	819	-	1,124	-
Aurora	1,113	15	2,025	-	3,017	-
Newmarket	358	15	514	18	684	11
East Gwillimbury	337	5	484	-	624	-
Bradford	229	2	360	-	446	-
Barrie South	263	-	474	-	660	-
Allandale Waterfront	254	-	282	-	305	-
Total	5,852	227	8,847	277	12,209	302

Future ridership forecasts for the proposed Caledonia GO Station and proposed Downsview Park GO Station were based on planning studies/forecasts previously prepared for these stations. In addition, the potential ridership impacts at the existing York University GO Station, due to the Barrie rail corridor service improvements, were assessed based on the forecasted operations with the Caledonia GO Station and Downsview Park GO Station being implemented.

Metrolinx provided forecasts for GO ridership at the Caledonia GO Station for 2021 conditions, based on a service level of 26 trains per day southbound and 27 trains per day northbound at this station. Since this station will primarily be a transfer station with the Eglinton Crosstown Light Rail Transit (ECLRT) line, the ridership forecasts provided were conservatively assumed to apply to the Future, Scenario 1 service level. For the Future, Scenario 2 service level, a factor of 1.55 was applied to the A.M. Peak Hour Caledonia GO Station traffic, to reflect the decreased headway time and increased number of trains in the counter-peak direction.

The forecasts for Future, Scenario 1, GO ridership at the Downsview Park GO Station were based on the Metrolinx transfer activity forecasts for the York University GO Station (an adjacent station with similar transfer characteristics) and the forecasted bus/walk activity forecasted for the Caledonia GO Station. For the Future, Scenario 2 service level, a factor of 1.55 was applied to the A.M. Peak Hour GO Barrie/Bus-Walk connections and a factor of 1.2 was applied to the A.M. Peak Hour subway traffic.

Metrolinx provided forecasts for GO ridership at the York University GO Station, which take into account the ridership impacts associated with the Barrie rail corridor improvements. In this respect the implementation of the Downsview Park GO Station is expected to capture some of the traffic that would otherwise be directed to the York University GO Station.

The A.M. Peak Hour forecasted ridership for the proposed Caledonia GO Station, proposed Downsview Park GO Station, and existing York University GO Station as impacted by the proposed GO Stations is summarized in Table 1-3.

Table 1-3: Barrie Rail Corridor Weekday A.M. Peak Hour Ridership Forecast for the Study Area Affected by the Proposed New Caledonia GO Station and Downsview Park GO Station

	2021 (Future, Scenario 1)		2025 (Future, Scenario 2)	
GO Station	**Boardings**	**Alightings**	**Boardings**	**Alightings**
Caledonia	50	225	80	350
Downsview Park	130	435	170	546
York University	32	165	81	269
Total	212	825	331	1165

Further details regarding the ridership demand forecast associated with the BRCE Project are provided in the TIA (Appendix I of this EPR).

New ridership forecasts were made available in February 2016 that will be reviewed and inform the detailed design phase of the BRCE Project.

It is noted that transportation demand management (TDM) initiatives will play a critical role in attracting new GO Rail ridership and managing GO station access. TDM is the use of policies, programs, services and products to encourage people to use sustainable modes of transportation instead of driving alone by car. Metrolinx's five year strategy includes key objectives to deliver TDM solutions in order to effectively achieve and support forecasted ridership increases, including initiatives such as education and information sharing (Smart Commute), carpooling incentives, fare integration between GO Transit and local transit systems, and encouraging walking and cycling.

1.1.5 *Current and Future GO Train Service Levels*

At present, commuter rail service along the Barrie rail corridor comprises the following:

Weekday Service:

- Five 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 for these trains is approximately 30 minutes. Two additional southbound trains run from the Maple GO Station to Union Station in the A.M. peak, creating approximately 15 minute headways between 7:00 A.M. and 8:00 A.M. south of the Maple GO Station;
- Seven 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
- GO Bus service is also provided to most GO Stations along the Barrie rail corridor during off-peak hours.

Weekend Service:

- As of December 31, 2016, year-round weekend GO train service is 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 Aurora GO Station.

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. To achieve a 15 minute, bi-directional service, the current peak service level of 14 trains per day will be increased over time as infrastructure on the Barrie rail corridor is upgraded and new rolling stock is added to the train fleet. As noted above, three service levels have been analyzed as part of this Assessment.

Future, Scenario 1 assumes the following train service along the Barrie rail corridor for the 2021 horizon year:

- Ten peak period, peak direction trains, three counter-peak direction trains, and five off-peak trains per direction between the Aurora GO Station and Union Station; and
- Five peak period, peak direction trains, and three off-peak trains per direction between the Allandale Waterfront GO Station and Union Station.

Future, Scenario 2 assumes the following train service along the Barrie rail corridor for the 2025 and beyond horizon period:

- All-day, two-way 15-minute service between the Aurora GO Station and Union Station;
- Peak period, peak direction 30-minute or better service between the Allandale Waterfront GO Station and Union Station; and
- Off-peak, two-way 60-minute service or better between the Allandale Waterfront GO Station and Union Station.

Figure 1-4 illustrates the frequency of RER train service during peak period (weekdays) and illustrates the frequency of RER train service during off-peak period (midday, evening and weekend).

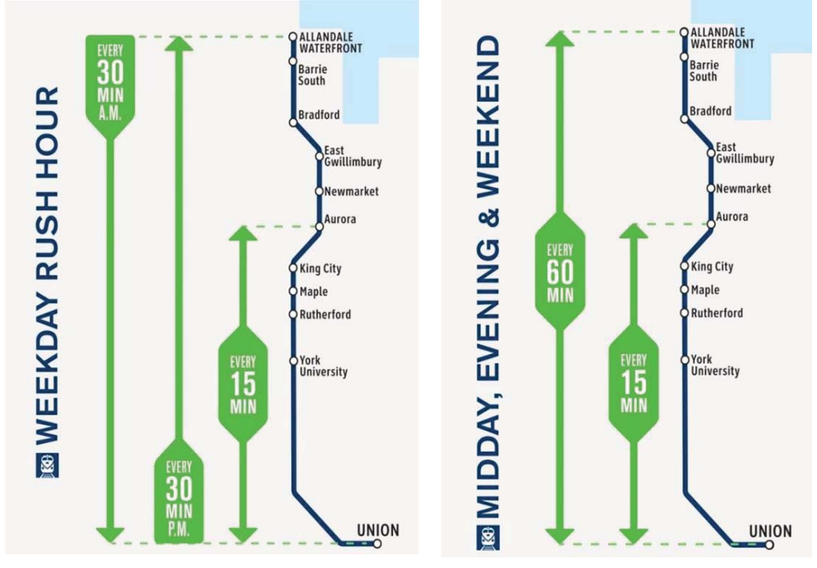

Figure 1-4: Future GO Barrie Service Plan[1]

[1] Peak Period: Weekday trains arriving at Union Station between 6:30 A.M. and 9:30 AM or departing from Union Station between 3:30 P.M. and 6:30 PM.

1.2 Project Purpose

Hatch in association with R.J. Burnside & Associates Limited (Burnside) was retained to complete this BRCE EPR in support of the TPAP. The purpose of the BRCE Project is to provide the infrastructure needed to support the planned service improvements on the Barrie rail corridor. Once constructed, implementation of the GO Expansion service will improve service along the Barrie rail corridor and connections to the wider GTHA and surrounding communities, providing people with improved transportation choices. Implementation of the Project will improve the GO Transit transportation experience and travel time reliability by providing faster, more frequent and less crowded transit and is expected to increase the proportion of trips taken by transit.

This Assessment reviews the need and justification for the BRCE Project, documents the existing conditions and constraints on the proposed Project, provides track, stations and layover concepts and preferred design plans, details the predictable environmental impacts or effects, and provides recommendations for addressing these effects through further study or mitigation.

1.3 Transit Project Assessment Process

The TPAP is a focused process, governed by the MOECC that recognizes and addresses the predictable environmental impacts and effects of transit projects. The TPAP requires that a preferred (or recommended) option is put forward for consultation with a clear rationale for community feedback. It creates an efficient plan that allows for project commencement, review and approval of the EPR (or Assessment) to occur within six months. The TPAP is regulated by the EAA under O. Reg. 231/08. The Ontario Ministry of the Environment (MOE) Guide entitled “Ontario’s Transit Project Assessment Process”, January 2014 was closely referenced in carrying out the Assessment.

1.3.1 Preliminary Planning Activities

The above noted Guide recommends a variety of consultation, baseline studies and assessments as part of the planning or Pre-TPAP phase. Components of the Pre-TPAP phase include:

- Identification and early consultation with potentially affected Aboriginal communities and other potentially interested stakeholders, adjacent property owners, regulatory agencies and affected municipalities;
- Initial identification of issues of provincial importance and constitutionally protected Aboriginal or Treaty Rights;
- Pre-notification, pre-consultation and response to any concerns raised;
- Completion of baseline studies, identification of potential environmental impacts and proposed measures to mitigate impacts; and
- Preparation of a draft EPR.

These activities lay the groundwork and foundation for the TPAP. In July 2014, Metrolinx initiated Pre-TPAP planning activities for the BRCE Project. This Assessment has been undertaken in accordance with the TPAP as outlined in O. Reg. 231/08.

1.3.2 Transit Project Assessment Process Phase

The TPAP centres on a specific transit project, in this case the BRCE Project and generally includes:

- Additional notification;
- Ongoing consultation and record keeping to document concerns and responses;
- Incorporation of comments into the Project concept and design;
- Identification of the significance of impacts, both positive and negative, including confirmation of any issues of provincial importance or constitutionally protected Aboriginal or Treaty Rights; and
- Updating and allowing for review of the EPR.

An objection process is available for those who feel their concerns have not been adequately addressed. Any objections must be submitted to the Minister of the Environment and Climate Change, as outlined in Figure 1-5.

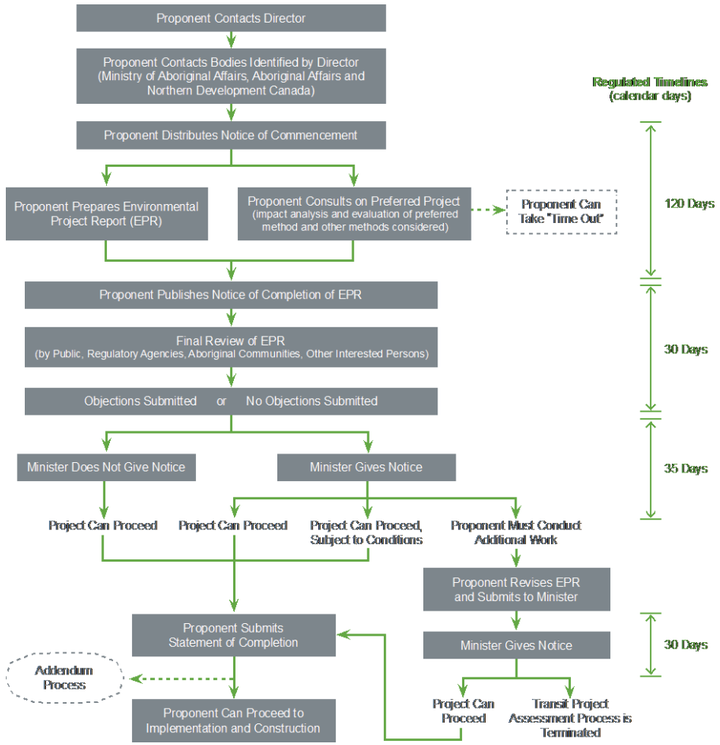

Figure 1-5: Transit Project Assessment Process

1.3.3 *Overview of the Environmental Project Report*

As part of documenting the TPAP, this EPR has been organized into eight sections and includes supporting environmental and technical study reports (included as appendices), to address the requirements set out in O. Reg. 231/08. The EPR document supports the planning and decision making process followed during the course of the Assessment. The EPR summarizes the existing conditions within the study area and the potential environmental effects that could occur as a result of implementing the BRCE Project on the basis of the preferred design. The EPR also provides mitigation measures and monitoring activities to address these potential environmental effects. In addition, the EPR documents all stakeholder consultation efforts made by the BRCE Project team to engage and obtain input related to the BRCE Project from the public, regulatory agencies, Aboriginal communities, affected municipalities and adjacent property owners.

In order to facilitate the review of this EPR in the context of the TPAP requirements, a concordance table (Table 1-4) has been prepared to direct the reader to the various sections of this EPR where they will find the components of the EPR that are established in the Guide to Ontario's Transit Project Assessment Process (MOE January, 2014). The eight sections of this EPR include the following:

1. Introduction and Study Process;
2. Project Description;
3. Existing Conditions;
4. Impact Assessment of the Preferred Design;
5. Stakeholder Consultation Process;
6. Permit and Approval Requirements;
7. Future Commitments; and
8. References.

The supporting environmental and technical study reports are provided as appendices to this EPR as follows:

Appendix A : Natural Environment Report

Appendix B : Tree Inventory Plan and Arborist Report

Appendix C: Stage 1 Archaeological Assessment

Appendix D : Cultural Heritage Screening Report (CHSR)

Appendix E : Cultural Heritage Evaluation Reports (CHERs), Statements of Cultural Heritage Value (SCHV) and Heritage Impact Assessment (HIA)

Appendix F : Socio-Economic and Land Use Characteristics Report

Appendix G : Air Quality Study

Appendix H : Noise and Vibration Impact Assessment

Appendix I : Traffic Impact Analysis

Appendix J : Stakeholder Consultation Report.

Table 1-4: Concordance Table

EPR Requirement	Section of EPR Where Requirement is Addressed
A statement of the purpose of the transit project and a summary of background information relating to the transit project.	Section 1
The final description of the transit project including a description of the preferred method.	Section 2
A description of any other design methods that were considered once the project commenced the transit project assessment process.	Section 2
A map showing the site of the transit project.	Section 1
A description of the local environmental conditions at the site of the transit project.	Section 3

EPR Requirement	Section of EPR Where Requirement is Addressed
A description of all studies undertaken in relation to the transit project, including a summary of all data collected or reviewed and a summary of all results and conclusions.	Section 3, Section 4, Appendices A – I
The assessments, evaluation and criteria for any impacts of the preferred method and any other design method (described above) that were considered once the project's transit project assessment process commenced (does not include Pre-TPAP work).	Section 4
A description of any proposed measures for mitigating any negative impacts that the transit project might have on the environment.	Section 4
If mitigation measures are proposed, a description of the proposal for monitoring or verifying the effectiveness of the mitigation measures.	Section 4
A description of any municipal, provincial, federal, or other approvals or permits that may be required for the transit project.	Section 6
A consultation record, including: • A description of the consultations and follow up efforts carried out with interested persons, including Aboriginal communities. • A list of the interested persons, including Aboriginal communities who participated in the consultations. • Summaries of the comments submitted by interested persons including Aboriginal communities. • A summary of discussions with Aboriginal communities including discussions of any potential impacts of the transit project on constitutionally protected Aboriginal or Treaty Rights, and copies of all written comments submitted by Aboriginal communities. • A description of what the proponent did to respond to concerns expressed by interested persons including Aboriginal communities.	Section 5, Appendix J
If a "time out" was taken during the transit project assessment process, a summary of each issue including: • A description of the issue. • A description of what the proponent did to respond to the issue and the results of those efforts. • The dates that notices for the "time out" were given to the Director, Environmental Approvals Branch (EAB), and the Regional Director (MOECC Central Region Office).	No time out required.

2. Project Description

The preferred design associated with the second track is identified in this section of the EPR along with a summary of the design criteria for the proposed infrastructure improvements, GO Stations and the proposed Bradford Layover Facility.

2.1 Rail Infrastructure

The survey of existing rail was performed from Bathurst Street at the west end of the Union Station Rail Corridor (USRC) to the Allandale Waterfront GO Station. This information was used to determine the arrangement of the existing track, as summarized in Table 2-1.

Table 2-1: Existing Corridor Track Arrangement

Mileage	Existing Track Arrangement
3.00 to 11.39	Single-Track
11.39 to 11.86	Double-Track, "East Track" and "West Track"
11.86 to 12.15	Single-Track
12.15 to 12.85	Double-Track, "East Track" and "West Track"
12.85 to 18.57	Single-Track
18.57 to 20.66	Double-Track, "East Track" and "West Track"
20.66 to 41.15	Single-Track
41.15 to 42.19	Mainline and NC49 Siding
42.19 to 63.00	Single-Track

The following table presents the design speeds to be achieved as part of this Project.

Table 2-2: Corridor Speeds

Mile	GO Speed (mph)	Passenger-VIA Speed (mph)	Freight Speed (mph)
3.00 to 4.19 *3.20 curve*	60	50	45
4.20 to 4.60 *Southbound* *Northbound*	45 60		45 45
4.60 to 5.50	45		35
5.50 to 6.00	65P+[1]		60
6.00 to 12.80	75		60
12.80 to 13.90	45		25
13.90 to 17.90	75		60
17.90 to 33.30	60		40
33.30 to 36.40	50		40
36.40 to 41.40	60		40
41.40 to 41.90	30		30
41.90 to 43.50	75		60
43.50 to 44.30	80		60

Mile	GO Speed (mph)	Passenger-VIA Speed (mph)	Freight Speed (mph)
44.30 to 49.30	70		40
49.30 to 50.00	80		60
50.00 to 50.30	75		60
50.30 to 52.80	80		60
52.80 to 53.00	60		50
53.00 to 54.10	80		60
54.10 to 56.60	60		50
56.60 to 58.60	80		60
58.60 to 59.30	60		50
59.30 to 63.00	30		15

[1.] 65P+ means any P+ train consists are restricted to a speed of 65 mph through those limits. P+ is typically applicable to trains with F40 locomotives and can also be applicable to P42 locomotives or Renaissance cars.

The existing design speed for GO Trains and freight trains varies throughout the Barrie rail corridor as dictated by the track alignment. The existing track geometry was reviewed relative to the corridor speeds. The review found that the section extending from the Major Mackenzie Drive Bridge (Mile 18.10) to the Maple GO Station (Mile 18.30) appears to be poor as the existing spiral on the bridge is substandard for the design speed to be achieved. In addition, the tangent length between the curve on the Major Mackenzie Drive Bridge and the curve through the Maple GO Station is substandard. To maintain the existing track speed and improve the track horizontal alignment, an additional bridge span at the west side of the existing Major Mackenzie Drive Bridge has been proposed for the two track expansion.

2.1.1 *Horizontal Alignment*

Existing Metrolinx property varies along the Barrie rail corridor and is generally within an approximately 20.12 metres (66 feet) wide ROW. The existing mainline is generally located to the east side of the corridor, slightly offset from the centre. Due to the excessive costs and difficulties in maintaining the existing track operation during construction, the corridor expansion has considered leaving the existing track in its current location. There are 88.8 km (55.18 miles) of proposed track for the new mainline which are to be constructed on the most appropriate side of the existing mainline given the location, resulting in the position of the second track switching several times over the length of the corridor.

Double tracking within the City of Toronto and York Region through the expanded GO Stations considered a future third express track, including an express track located through the middle of the stations, except for the Newmarket GO Station, and the Aurora GO Station where a new pocket track is proposed.

Generally, horizontal alignment maintains the required minimum track spacing. At certain locations, this spacing is increased in order to meet existing features such as grade separations or new features such as the station platforms. Compound curves are used around some of the longer curves if the existing track appears to have compound curvature. Spirals are included between compound curves when the difference in superelevation between adjacent circular curves is greater than ¼". Section 2.1.4 identifies and describes segments where considerations are given between sound track geometry with extra track spacing and fairly poor track geometry with less track spacing.

2.1.2 *Vertical Alignment*

The existing track profile has been surveyed as having a maximum grade of approximately 2.0% at the USRC. The survey also showed that the majority of the track has an absolute grade of less than 1.0%. The proposed track profile follows the existing track profile with an allowable variance of 2" (50mm). This is maintained throughout the entire alignment except where other vertical requirements govern, such as clearance at bridges and matching grade at level crossings.

From the survey data obtained, fitting a representative profile to the baseline alignment was possible only by using numerous, short, closely spaced vertical curves. The new profile of the proposed track follows the baseline profile but was revised in order to minimize the number of vertical curves and increase their lengths, while still maintaining a variance of ±2". Lengths of vertical curves were determined using design speeds, maximum allowable vertical acceleration and absolute differences in gradients.

2.1.3 *Preferred Track Designs*

The Preferred Design Rail Corridor Plans (Drawings SK-C-001 - SK-C-144) are appended to this EPR.

2.1.3.1 *Track Centres*

GO Track Standards and Transport Canada's Standard Respecting Railway Clearances both allow a minimum of 13' (3.962 m) centreline spacing between adjacent mainlines. With consideration given to the existing condition on the Barrie rail corridor, and to minimize property requirements, costly bank widening, retaining wall construction, and/or grade separation modifications, reduction of track spacing on curvature may be considered on a case by case basis.

2.1.3.2 *Vertical Control*

The proposed track follows the existing track as a general guideline in terms of track vertical profile. Where the track runs over grade separated roads, the standard of 5.3 metres between the road surface and the underside of the structure is used to determine the vertical profile of the new track. Clearance for the Dynamic Envelope should be accommodated within the corridor ROW.

2.1.3.3 *Typical Track Cross-Section*

The Metrolinx Design Requirements Manual (DRM) CI-0807 Figure - Ballast Cross Sections for level and superelevated double tracks is used which indicates track cross section parameters, including sub-ballast shoulder width widening while superelevated. In addition, CNR Standard TS-2205 Typical Ballast Sections and TS-2204 Typical Embankments & Excavations Roadbeds for Main Line Track are used in determining the dimensions of the new track. Where new track bed is required, the new track is to be built adjacent to the existing mainlines by widening the existing cross-section. CNR Standard TS-2205 specifies that mainline ballast and sub-ballast depths are to be 12" with 12" ballast shoulders. CNR Standard TS-2204 specifies properties for subgrade dimensions and ditches. The typical cross-section used on this project has 2:1 side slopes for embankments and for cut slopes.

The track and grading design will spatially protect for the proposed Overhead Catenary System (OCS) pole layout locations as required for the future corridor electrification.

2.1.3.4 Rail/Ties/Ballast

Concrete ties are to be specified for all new track installations and for upgrades to the existing tracks. Areas such as switches, spurs, and road crossings will be constructed using wood ties. Concrete tie details shall comply with Drawing T-001 Concrete Tie Standard Drawing 115LB RE Running Rail developed by AECOM. Wood tie transitions to concrete ties will be required to account for the difference in track stiffness.

2.1.4 Site Specific Rail Infrastructure Considerations

2.1.4.1 City of Toronto (Mile 3.00 to 12.92)

Table 2-3 below provides an outline of the works for the proposed double-tracking in the City of Toronto.

Table 2-3: Proposed Track Works within City of Toronto - Double Tracking

Mile	Existing Track Arrangement	Proposed Arrangement (Double-Track Upgrade)
3.00 to 3.51	Single-Track	Track shift for Bloor Street West Bridge at Mi. 3.91. This section may require coordination with the future Bloor-Davenport GO station.
3.51 to 3.91	Single-Track	New track to west of existing track. This section will require coordination with new Davenport Diamond Grade Separation Design.
3.91 to 4.87	Single-Track	Track configuration developed under separate EA. Coordination with future detail design work will be necessary to ensure continuity between the two projects. Tracks are proposed to be elevated to span across the CPR North Toronto Subdivision tracks.
4.87 to 8.48	Single-Track	New track to east of existing track. This section will require coordination with Caledonia GO Station.
8.48 to 8.92	Single-Track	Track shift to accommodate double tracking within the corridor. New track to east of existing track.
8.92 to 11.18	Single-Track	New track to west of existing track. This section is aligned with the new Downsview Park GO Station.
11.18 to 11.35	Single-Track	New track shifted to the east of existing track to avoid an existing service track to the west.
11.35 to 12.26	Single-Track	New track to east of existing track to connect with existing east double track.
12.26 to 12.92	Double-Track	No track expansion required. This section consists of two main lines and at the time of this writing a second main line track was being constructed under Metrolinx Contract IT-2014-ERC-021. It is noted that no additional platform is required at York University GO Station.

It should be noted that the section between Mile 3.91 to 4.87 is located within the project area for the “Davenport Diamond Grade Separation” and has been assessed through a separate TPAP. The TPAP has been completed for this section of the Barrie rail corridor (between Mile 3.91 to Mile 4.87) and design of the grade separation is underway. In the area immediately south of Eglinton Avenue, the track will be laterally slued to minimize property impacts on both sides of the corridor.

Double Tracking

Within the City of Toronto there is a total of 11.572 miles (18.620 km) of track. The total length of new double tracking within the City of Toronto limits is 8.30 miles (13.36 km).

The Newmarket East and Newmarket West tracks will share the corridor with the Lower Galt and Weston Subdivisions through the newly constructed Strachan Avenue Grade Separation, the King Street Bridge, the Queen Street Bridge, the proposed Dufferin Street Bridge Widening, the Brock Avenue Bridge and the newly-widened Lansdowne Avenue Bridge. After this, the Newmarket Subdivision splits away from the other subdivisions. The existing track will be realigned to suit the as-built widening of the Lansdowne Avenue Bridge and to match the existing track north of the Dundas Street Overpass. North of the Dundas Street Overpass, the proposed second track shifts to the west of the existing mainline track.

The second track alignment will be shifted to the west side of the Barrie rail corridor at the Highway 401 overpass to accommodate a new wider corridor within the existing ROW. The existing Highway 401 tunnel structure is wide enough to accommodate the track expansion.

The proposed second track will be shifted to the east side of the corridor at the north of the proposed Downsview Park GO Station to avoid modifications of the existing service track along the west side of the existing mainline. With the detailed design of the proposed GO Station and Sheppard Avenue Bridge widening in progress, it is anticipated that the track alignment from the Carl Hall Road level crossing, through the Sheppard Avenue Bridge, and further north to the turnout for service track A283 south of the Finch Avenue Bridge will be adjusted in accordance with the progressed design from these other projects.

The existing track through the Finch Avenue Bridge with the existing west service track A283 will remain for the second track expansion. The proposed second track on the east side, through the Toronto Transit Commission (TTC) York University Bus Route level crossing, will tie into the existing second track.

New GO Station

Under a separate contract there is a future Bloor-Davenport GO Station being investigated south of the Bloor Street Bridge. Location of station platforms would require alignment modifications in this area and widening of the Bloor Street Bridge or a new span.

The proposed Downsview Park GO Station with platforms on the widened Sheppard Avenue Bridge is currently being designed under a separate contract. The second track is aligned for the west platform, which accommodates for a third track in the middle as the new station will be configured for both second and third tracks to be to the west of the existing mainline track. This GO Station will be integrated with the TTC Sheppard West Station of the Toronto York Spadina Subway, which is currently under construction. North of the Eglinton Avenue Overpass, there will be the new Caledonia GO Station, currently being designed under a separate contract. This new GO Station, integrated with the ECLRT Station, will create a transit hub at this location. As per the latest design considerations, the existing track through the Caledonia GO Station is proposed to be shifted east to provide more space for an island platform and the future third track expansion.

Double Crossovers

Double crossovers are proposed north of Castlefield Avenue fitting into horizontal and vertical tangents. The original location according to the Metrolinx track schematic was between the Innes Avenue Pedestrian Overpass and the Rogers Road Bridge, but this is not suitable due to the horizontal curve of the existing track and the narrow Barrie rail corridor property.

Double crossovers were initially proposed between the TTC York University Bus Route level crossing and Spur A297. However, due to the horizontal and vertical curvature of the existing track, the crossovers cannot be located at the proposed location. Instead, the crossovers located between Mile 12.73 and Mile 18.89 on the existing double track will be used.

Maintenance of Way Track

A new 1000' (304.8 metres) long maintenance of way track (MOWT) and an adjacent access road is proposed north of Lawrence Avenue. This will be tied to the proposed second track with a left-hand turnout.

2.1.4.2 *York Region (Mile 12.92 to 41.00)*

The outline of the works for the proposed double-tracking within York Region are summarized in Table 2-4.

Table 2-4: Proposed Track Works within York Region – Double Tracking

Mile	Existing Track Arrangement	Proposed Arrangement (Double-Track Upgrade)
12.92 to 16.31	Double-Track, "East Track" and "West Track"	No works to install new track, but coordination with Contract IT-2014-ERC-021 design is required. It is noted that no additional platform required at York University GO Station.
16.31 to 17.35	Single-Track	New track to east of existing track. This section requires coordination with Rutherford GO Station expansion, and new Rutherford Road Grade Separation design.
17.35 to 18.61	Single-Track	New track to west of existing track. The section requires coordination with Maple GO Station expansion design.
18.61 to 20.54	Double-Track, "East Track" and "West Track"	No works required.
20.54 to 30.10	Single-Track	New track to west of existing track, new pocket track added to west at Aurora GO Station. This section requires coordination with the King City GO Station expansion design and the Aurora GO Station expansion design.
30.10 to 33.80	Single-Track	New track to west of existing track
33.80 to 34.00	Single-Track	Existing track shift approximately 2 m to east to avoid existing sanitary sewer at Queen Street Overpass, new track to west existing track.
34.00 to 35.10	Single-Track	New track to west of existing track. This section requires coordination with the Newmarket GO Station expansion design.
35.10 to 35.60	Single-Track	Track shift to east for East Gwillimbury GO Station. This section requires coordination with the East Gwillimbury GO Station expansion design.
35.60 to 37.80	Single-Track	Track shift to west to avoid Rogers Reservoir. New track to west of existing track. Track shift to east to accommodate recently constructed overpass structure at Concession Road 2 (Mile 36.38).
37.80 to 38.50	Single-Track	Track shift to east side
38.50 to 38.80	Single-Track	Track shift to west side.
38.80 to 41.00	Single-Track	New track to west of existing track.

Double Tracking

Within York Region there is a total of 28.08 miles (45.190 km) of track. Double tracking is required on 22.76 miles (36.628 km) of this total track. As described in the previous section, the existing double track north of Spur A297 extends to Mile 16.40, south of the Rutherford GO Station, with a left-hand turnout at the north end.

City of Vaughan

North of Mile 16.31, the proposed second track on the east side of the corridor will be connected to the existing east track. For the two track expansion, the track spacing needs to be increased so the second track can connect to the third track at the Rutherford GO Station, allowing a future express track in the middle through the station. A grade separation will be designed at Rutherford Road. It is anticipated that the alignment for both the permanent and staging tracks will be developed once the detailed design of the grade separation is in progress.

The proposed second track will be shifted to the west side to the north of Rutherford Road to better suit the corridor ROW and the existing configuration of the Major Mackenzie Drive Bridge and Maple GO Station further to the north. The existing track geometry through the Major Mackenzie Drive Bridge and Maple GO Station appears to be poor as the existing spiral on the bridge is substandard for the corridor speed. In addition, the tangent length between the curve on the Major Mackenzie Drive Bridge and the curve through the Maple GO Station is substandard. To maintain the existing track speed and improve the track horizontal alignment, an additional bridge span at the west side of the existing Major Mackenzie Drive Bridge has been proposed for the two track expansion. This is to accommodate the second track transition into the third track at the Maple GO Station, with provision for the future express track through the existing bridge and in the middle of the station tracks. The track geometry will be further reviewed and evaluated prior to Project construction during the detailed design phase. Double crossovers are proposed between the Rutherford GO Station and Maple GO Station, near the half-way point between these stations, that is, between Mile 17.60 and Mile 17.76.

For the two track expansion, the west side new track will connect to the existing west track once it passes the Maple GO Station and the McNaughton Road level crossing. The existing double track configuration starts from this location, travelling northwards through the Teston Side Road level crossing, Keele Street Overpass, and several farm crossings until south of the Kirby Road level crossing.

The existing second track will be extended northwards as the new second track, along the west side of the corridor through the Kirby Road level crossing, a series of farm crossings and beyond the King-Vaughan Townline Road level crossing. The second track will then transition into becoming the third track at the King City GO Station to accommodate the future express middle track through the station platform.

Township of King

The proposed second track through the King City GO Station and Station Road level crossing will continue northwards on the west side through the junction of the King Road Overpass and Keele Street Overpass. At both overpasses, the track will curve eastward on a curve. Track spacing and clearances to the existing west bridge abutments are critical to determine if the existing track realignment is required. Track alignment through this location will be re-assessed based on a field survey of existing bridge structures prior to Project construction during the detailed design phase.

The two track expansion will continue with the new track being located on the west side, northwards through a Pedestrian Tunnel at Mile 23.93, a level crossing at Dufferin Street, the East Humber River Bridge, the Bloomington Road level crossing, the Bathurst Street Overpass, and the Yonge Street Bridge. The Pedestrian Tunnel (Mile 23.93), the East Humber River Bridge (Mile 24.90) and the Yonge Street Overpass (Mile 28.50) will be expanded to accommodate a possible future third track. Spur line A957 at Mile 24.16 is to remain as existing, and double crossovers will be placed south of Bloomington Road at Mile 25.86. At the Bathurst Street Overpass, minimal clearance was obtained from existing piers to the centreline of track. There is approximately 7.9 metres from the existing track centre to the nearest west abutment face at the Bathurst Street Overpass. For the second track, a clearance of 2.566 metres was attained.

Town of Aurora

The existing Yonge Street Bridge can only accommodate a single track; therefore a second bridge span will need to be designed. A new double track bridge span will be designed in order to accommodate a possible future third track to be located north of the proposed second track. An offset of 8.23 metres between the existing mainline and proposed second track will be designed. The allowance for a future third track makes more efficient use of the new bridge infrastructure and will result in fewer property acquisition requirements in the future as a third single track bridge would have a significantly larger footprint.

The proposed second track will run on the west side of the corridor through the Engelhard Drive level crossing, after which double crossovers are proposed and a left hand turnout to a new pocket track will be constructed immediately south of the Aurora GO Station. A new centre platform will be provided for the second track and new pocket track at the Aurora GO Station. The second track will be located on the west side of the corridor from the Aurora GO Station, heading northwards through the Wellington Street and Centre Street level crossings.

Town of Newmarket

Within the Town of Newmarket, the second track will run parallel to the existing track, through the St John's Sideroad, Mulock Drive, Water Street and Timothy Street level crossings, and the East Holland River Bridge.

There is a 20 metre Metrolinx ROW with the existing track located 8 metres from the east property limit throughout the majority of this section of the Barrie rail corridor. In an ideal situation, the two tracks would be located in the middle of corridor with the existing track shifted approximately 2 metres to the east so that the property impact and required retaining walls can be reduced. However, in this stretch of corridor there are four existing culverts or bridges which are built for single track only and this restricts the existing track alignment. These culverts or bridges are located at Mile 31.50 (Tannery Creek), Mile 32.00 (Clubinis Creek), Mile 32.20 (Wesley Creek), Mile 33.70 (East Holland River) and Mile 34.30 (Unnamed Creek). In addition, shifting the existing track would require major grading works on the east side of the corridor as well as track staging to maintain the existing rail operations. This is to be further evaluated based on a review of the cross sections, to be conducted during the detailed design phase.

The second track will only have an approximate 2.5 metre minimum clearance to the existing sanitary sewer along the west side around the Queen Street Overpass if the existing track remains on the current alignment. Due to the existing grade restriction, relocation of the existing sanitary sewer is not recommended based on a preliminary evaluation. The existing track will be shifted to the east side approximately 2.0 metres so that the second track on the west will allow a minimum 4.8 metre clearance to the existing sanitary sewer. The existing track is to be shifted back to its current alignment through a curve to the south of Davis Drive and the second track will continue on the west side passing the Davis Drive level crossing, to suit the curved track at the Newmarket GO Station.

The second track on the west side of the corridor will shift to the east side of the corridor north of the Newmarket GO Station and south of the Newmarket Pedestrian level crossing to suit the proposed station platform on the east side of the East Gwillimbury GO Station. To avoid the naturalized area along the east side of the corridor, the preferred design has the second track continuing on the west side of the corridor further north, passing the Newmarket Pedestrian level crossing before shifting to the east side at the curve immediately south of the East Gwillimbury GO Station. At Mile 34.30 within the Newmarket GO Station, there will be an additional bridge span required for the new track and the new west platform. Given that there is a tight curve through the Newmarket GO Station, the track geometry is critical for station expansion. There is also a tight curve northwards approaching the East Gwillimbury GO Station, where the track will be shifted through this curve.

Town of East Gwillimbury

Once past the Green Lane level crossing, the new track on the east side of the corridor will transition back to the existing track, and the existing track will be shifted to the west side to become the new west track to avoid property impact on the east side. The second track will continue along the west side, and then need to shift to the east side with a tight curve on approach to the Concession Road 2 Bridge. The existing curve appears to be a compound curve but the radius difference between the curves is fairly low. Track shifting through this curve will improve the horizontal track geometry. The existing track around the curve at the Rogers Reservoir will be realigned to minimize grading requirements for the track construction.

The track will shift back to the west side while passing Concession Road 2 to avoid impact on the Rogers Reservoir. This will continue until the Old Yonge Street level crossing at Mile 37.71. At this point the second track will shift to the east side of the corridor to avoid impact on Holland Landing Road before shifting back to the west side of the corridor immediately north of Bradford Street at Mile 38.43. There is a 20 metre Metrolinx ROW with the existing track located 8 metres from the east property limit throughout the majority of this section of the corridor. It is proposed that the new track located on the east side of the corridor will give only approximately 4 metres distance from the track centreline to the east property line. As a result, grading works will be significant and property impacts will need to be considered prior to Project construction during the detailed design phase.

Town of East Gwillimbury/Township of King

In addition to the above, the Rogers Reservoir and the Holland Marsh (which is designated as a Provincially Significant Wetland (PSW) along much of the east side of corridor) will be impacted if the new track is proposed on the east side. If the new second track is located on the west side of the existing track, there will be approximately 8 metres space from the new track centre to the west property limit. As a result, property impacts should be limited. However, there are major roads along the west side of the corridor, Holland Landing Road from Old Yonge Street northwards, which then becomes Bathurst Street at the level crossing at Mile 39.66, and Highway 11 along the west side of the corridor from Bathurst Street northwards past the Holland River Bridge to the Bradford GO Station. The closest distance from the edge of the road to the Metrolinx west property limit is approximately 10 metres so grading and drainage could be challenges, as well as traffic and sight analysis; both of which will be conducted prior to Project construction during the detailed design phase.

Double Crossovers

Double crossovers were initially between Mile 22.40 and Mile 22.60. Due to the curvature of the existing track, the proposed double cross over location is to be moved south, between Mile 22.09 and Mile 22.25. Double crossovers are also proposed to the north between Mile 36.50 and Mile 36.70.

Maintenance of Way Track

A new MOWT at Mile 30.29 will be constructed east of the existing track with a right hand turnout. The MOWT will provide 1000' (304.8 metres) track capacity and have a service road with access to Industrial Parkway at north end and a turnaround area at south end.

A MOWT will also be constructed at Mile 38.80 along the east side of the existing track with a right hand turnout, with 1000' (304.8m) track capacity, service road and access to Toll Road at the north end, and a turnaround area at south end.

2.1.4.3 *Simcoe County and the City of Barrie (Mile 41.00 to 63.00)*

Within Simcoe County and the City of Barrie there is a total of 22.00 miles (35.410 km) of track. Double tracking is required along the entire existing track. The outline of the works for the proposed double-tracking within Simcoe County and the City of Barrie are summarized in Table 2-5.

Table 2-5: Proposed Track Works within Simcoe County - Double Tracking

Mile	Existing Track Arrangement	Proposed Arrangement (Double-Track Upgrade)
41.00 to 41.30	Single-Track	New track to west of existing subdivision.
41.30 to 42.10	Mainline and Siding	Siding NC49 to be upgraded as new second mainline track. This section requires coordination with the Bradford GO Station expansion design.
42.10 to 45.70	Single-Track	New track to west of existing subdivision.
45.70 to 47.00	Single-Track	Track shift to east, new track to east of existing subdivision.
47.00 to 55.30	Single-Track	Track shift to west, new track to west of existing subdivision.
55.30 to 55.70	Single-Track	Track shift to east for Innisfil Beach Road.
55.70 to 59.50	Single-Track	Track shift to west, new track to west of existing subdivision.
59.50 to 59.70	Single-Track	Track shift to east to accommodate Barrie South GO Station expansion, new track to east of existing subdivision. This section requires coordination with Barrie South GO Station expansion design.
59.70 to 62.00	Single-Track	Track shift to west (south), new track to west (south) of existing subdivision.
62.00 to 63.00	Barrie Layover Yard, Mainline, Siding and Service Track	Upgrade existing west track to secondary mainline to west (south) of existing subdivision.

Town of Bradford West Gwillimbury

The new second track on the west side of the corridor will require a new rail bridge on the west side of the existing bridge over the Holland River (West Branch) at Mile 41.00. This bridge will be approximately 15 metres to the east of the existing Highway 11 Bridge. The new second track will tie into the existing west track of the corridor to the north of the Holland River Bridge, and the existing turnout for the service track will be relocated. Currently, the existing double track travels through the Bradford GO Station on a curve. If a station upgrade is required, the track geometry can be modified. However, any track alignment adjustment towards the east side will be limited due to the adjacent intensive agricultural lands, cultural meadow vegetation community, and potions of the provincially significant Holland Marsh Wetland Complex. In addition, existing service tracks on the west side need to be modified if the west track is realigned.

North of the Bradford GO Station, the existing west track will be extended as the new second track parallel to the existing track on the west side of the corridor beyond Mile 42.10. The new track will shift to the east side immediately north of Line 11 (Mile 45.37) before switching back to the west side immediately south of Line 13 (Mile 47.21). There is a 20 metre wide Metrolinx ROW with the existing track located 8 to 9.5 metres distance from the east property limit throughout the majority of this portion of the corridor. If the new track is located on the east side of the corridor it will provide approximately 4 to 5.5 metres distance from centre of the new track to the east property line, in comparison with approximately 6.5 to 8 metres space from the centre of the new track to the west property line if the new track is proposed on the west side of the corridor. In addition, portions of the provincially significant Holland Marsh Wetland Complex, and the Scanlon Creek Conservation Area are located on the east side, along large segments of the corridor, thereby posing a challenge.

Town of Innisfil

The second track will run parallel with the existing track on the west side of the corridor northwards until south of Innisfil Beach Road at Mile 55.55, where the track alignment will be shifted to the east side to avoid traffic constraints due to 20th Sideroad on the west side intersection with Innisfil Beach Road. The intersection at the centrelines is less than 20 metres distance from the centre of the existing track. As a result the new track on the west side of the corridor will require the road intersection to be reconfigured. However, the new track located on the east side of the corridor may result in property issues, in particular, the commercial property and potential new developments located to the southeast of the level crossing.

City of Barrie

Once passing Innisfil Beach Road, the new second track will be shifted to the west side of the corridor, parallel to the existing track. This will extend northwards passing through Lockhart Road at Mile 58.47, where a proposed grade separation is currently under evaluation by the City of Barrie. The second track will be shifted to the east side of the corridor through the curve to suit the east side platform expansion at the Barrie South GO Station. Although there is an approximately 20 metre wide Metrolinx ROW and the existing track is situated approximately 2 metres to the east of the corridor centreline, the impacts on developed properties along the west side of the corridor including residential housing are deemed more critical than the undeveloped properties along the east side.

Once past Barrie South GO Station the new track will be shifted to the west side of the corridor and will continue along the west side, passing underneath the Big Bay Point Road overpass, overtop Cox Mill Road and Tollendale Creek Bridges, then connect to the existing Beeton Spur track at approximately Mile 62.51. This spur track will be upgraded to main line standards. The second main line will terminate at the Allandale Waterfront GO Station (Mile 62.90) but the connection to the Meaford Subdivision will be maintained at the north end of the station, The existing station will be upgraded with a new west platform to service the new second track.

The new second track located on the west side of the corridor will eliminate the need to modify the existing intersection at Little Avenue and Hurst Drive at Mile 61.30, which is located on the east side of the Barrie rail corridor, close to the existing level crossing at Little Avenue.

Double Crossovers

A set of double crossovers will be located north of the Bradford GO Station around Mile 42.00. A new train layover facility is proposed within the Artesian Industrial Park just north of Line 8 around Mile 43.00. Once the site for the layover facility is finalized, the track alignment will need to be adjusted to suit the new turnout arrangement for the lead track into the layover facility. Double crossovers will also be located around Mile 47.50 and Mile 52.60, and south of the Barrie South GO Station around Mile 58.90.

Maintenance of Way Track

A MOWT with a left-hand turnout is proposed at Mile 51.80 near Killarney Beach Road.

2.1.5 *Culverts*

A total of 180 culvert/bridge water course crossings were inventoried and evaluated through field inspections and structural surveys conducted by Hatch during the period of April to September, 2015. For the purpose of hydrology and hydraulic modelling, the number of existing crossing structures has been divided into two categories:

Category 1 watercourse crossings include culvert and bridge crossings that are situated along watercourses regulated by the Toronto and Region Conservation Authority (TRCA) or the Lake Simcoe Region Conservation Authority (LSRCA). Approved hydrology and hydraulic models for these structures have been provided by the applicable authority and utilized to evaluate the existing and proposed hydraulic conditions of these watercourse locations. As a result of the hydraulic analysis, bridge crossing locations have been evaluated and a number of these features will be replaced and/or extended; and

Category 2 culverts are drainage structures that cross the rail corridor requiring hydrology and hydraulic analysis. These culverts convey external drainage areas from the neighbouring properties through the corridor and have been evaluated based on existing site conditions. As a result of the hydraulic analysis, culvert crossing locations were evaluated and a number of these features will be replaced and/or extended, as identified in Table 2-6.

Table 2-6: Category 2 Culvert Crossings Evaluation

Region	Municipality	Mileage	Number of Culverts Recommended for Replacement			
			Upsize due to Existing Hydraulics	Replace Due to Condition	Extended due to Track Widening	Climate Change (100 Year + 25%)
City of Toronto	City of Toronto	3.00-12.90	4	2	5	1
York Region	City of Vaughan	12.90-22.50	11	0	14	1
	Township of King	22.50-26.49	4	1	15	1
		39.66-40.99	0	0	1	1
	Town of Aurora	26.49-31.50	4	2	7	0
	Town of Newmarket	31.50-35.37	6	1	6	2
	Town of East Gwillimbury	35.37-39.66	10	3	4	0
Simcoe County	Town of Bradford West Gwillimbury	40.99-47.72	10	5	12	0
	Town of Innisfil	47.72-58.45	11	2	18	3
	City of Barrie	58.45-63.00	0	1	5	1
		TOTAL	60	17	87	10

[1] *The total number of culvert crossings recommended for upsizing to accommodate the additional climate change flows (100 year proposed + 25% peak flow) do not include those identified for upsizing due to existing hydraulic deficiency.*

In summary, for the Category 1 crossing structures the following recommended changes are proposed. A total of nine Category 1 crossing structures are recommended to be altered with either new or relief culvert structures as a result of the track design and existing/proposed hydraulics. All remaining structures will feature similar hydraulic capacities with the key alteration being an increased deck width. The remaining 14 Category 1 crossing structures will be adjusted and have been evaluated to meet the required hydraulic capacity of the track design.

In summary, for the Category 2 culvert crossings there are the following recommended changes:

- In summary: A total of 60 culvert crossing structures are recommended to be replaced due to existing hydraulic deficiency (100 year existing and proposed hydraulics);

- A total of 17 culvert crossing structures are recommended to be replaced as a result of the field condition inspection;
- A total of 87 Category 2 culvert crossing structures will be extended as a result of the track design; and
- A total of 10 culvert crossings have been recommended for upsizing to accommodate the additional climate change flows (100 year proposed + 25% peak flow).

The replacement of culverts will be designed in accordance with the MTO Drainage Management Manual (2008) and the American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering (2013). The intensity of a 100-year design storm will increase by 25% as per projections of climate change for Ontario.

2.1.6 *Bridges*

A total of 28 existing bridges were inventoried and evaluated through field inspections and structural surveys. Of the existing bridges that cross the Barrie rail corridor, 15 will be affected by the Project. This EPR outlines the modifications required to each structure including reinforcement, extension, reconstruction of the existing structure or new span construction. Several bridges and smaller structures, as well as the existing stations and their platforms are to be reconfigured to accommodate the second track as well as future expansion for a third track, where applicable. The Table 2-7 shows each bridge structure affected by the BRCE Project and the proposed major works required to accommodate the second track and GO Station improvements.

Table 2-7: List of Existing Bridges Affected by the Project

Mile	Structure	2-Track Design	Future Expansion Design
City of Toronto			
3.12	Lansdowne Avenue	No modifications required.	Not applicable.
3.37	Dundas Street	No modifications required.	Not applicable.
3.91	Bloor Street	No modifications required.	Not applicable.
4.87	Davenport Road	No modifications required.	Not applicable.
5.24	St. Clair Avenue West	No modifications required.	Not applicable.
5.86	Rogers Road	No modifications required.	Not applicable.
6.12	Dunraven Drive Pedestrian Tunnel	No modifications required.	Not applicable.
7.81	Lawrence Avenue West	No modifications required.	Not applicable.
9.12	Wilson Avenue	No modifications required.	Not applicable.
10.80	Downsview GO Station	No modifications required.	Not applicable.
10.87	Sheppard Avenue	No modifications required.	New railway and pedestrian spans and abutments required to accommodate new station platforms.
11.65	Finch Avenue	No modifications required.	Not applicable.
12.92	Steeles Avenue	No modifications required.	Not applicable.
York Region - City of Vaughan			
13.25	Snider Grade Separation (CNR York Subdivision Overpass)	No modifications required.	Not applicable.
16.83	Rutherford Road	New grade separation structure.	New grade separation structure.
18.10	Major Mackenzie Drive	New span and extended abutments required.	No further modifications required.
York Region - Township of King			
23.93	Pedestrian Tunnel	New wingwalls required on west side.	Tunnel extension required with wing walls.
24.90	Humber River	Insert Corrugated Steel Pipe (CSP) culvert extension and add overflow culverts.	Insert CSP culvert extension and add overflow culverts.
26.50	Bathurst Street Overpass Crashwall	Reinforce existing overhead bridge piers.	Reinforce existing overhead bridge piers and build retaining wall to support bridge abutments.
York Region - Town of Aurora			
28.50	Yonge Street	New double track span and extended abutments required.	No further modifications required.
30.02	Unnamed Watercourse	Insert precast concrete box extension.	Insert precast concrete box extension.
York Region - Town of Newmarket			
31.50	Tannery Creek	Insert CSP culvert in existing to extend and add new CSP overflow culverts and retaining wall.	Insert CSP culvert in existing to extend and add new CSP overflow culverts and retaining wall.
32.00	Clubinis Creek	New independent structure required.	Replace existing bridge with three track structure.
32.20	Wesley Creek	New box culvert required.	New box culvert required.
33.70	Holland River Bridge	New span and extended abutments required.	New span and extended abutments required to east of existing bridge.
33.95	Queen Street Overhead	Reinforce existing foundations for train impact.	Reinforce existing foundations for train impact.
34.30	Westerton Culvert	Replace existing structure supporting track and platform.	Not applicable.

Mile	Structure	2-Track Design	Future Expansion Design
Simcoe County - Town of Bradford West Gwillimbury			
41.00	Holland River Bridge	New independent structure required.	Not applicable.
City of Barrie			
61.14	Cox Mill Road Bridge	New independent structure required.	Not applicable.

2.1.7 *Drainage*

Stormwater runoff within the rail ROW will be managed using one or a combination of the three conveyance systems options detailed below, as required. This will be confirmed prior to Project construction during the detailed design phase.

2.1.7.1 *Conveyance System Option 1 – Open Ditch-Conveyance System*

The CNR standard trackbed cross section (TS-2204) calls for a minimum of 1.2 metres (4') wide open ditch with a depth of 0.9 metres (3'). Using 2:1 side slopes, a ditch this size occupies a total width of 4.88 metres (16'), which is too wide for the space available on the existing ROW in numerous locations. By applying the Manning's equation to the various drainage areas, a minimum ditch size was established to minimize the necessity for retaining walls or property acquisition as shown in Figure 2-1. The minimum ditch depth was found to be between 0.5 metres to 0.6 metres assuming a ditch base width of 0.6 metres.

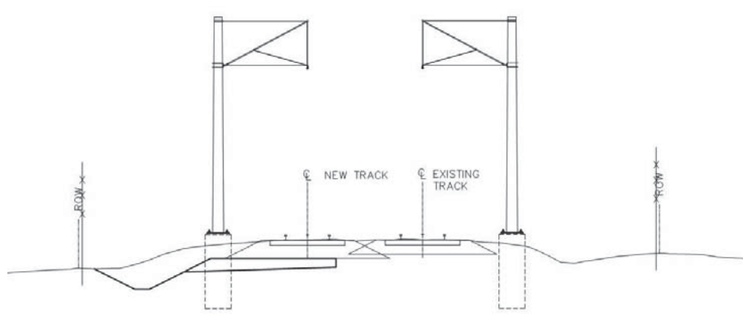

Figure 2-1: Open Ditch Conveyance System Sketch

2.1.7.2 *Conveyance System Option 2 – Storm Sewers and Track Subdrains with Swale*

To occupy less space than an open ditch, storm sewers could be built with a series of catchbasin inlets, as shown in Figure 2-2. This option would marginally reduce the required cross section width than the ditch construction option described in Option 3, and would be much more expensive to build and maintain.

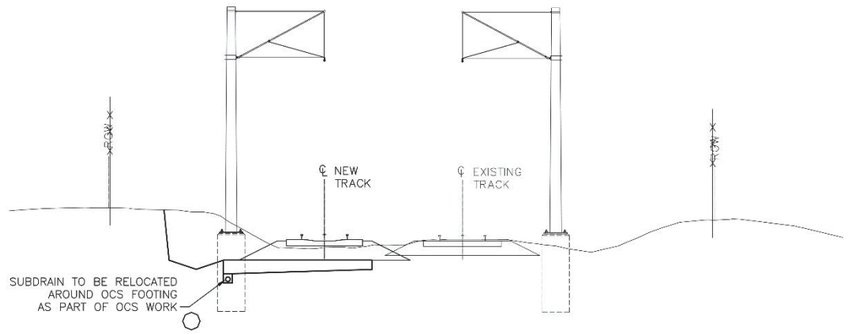

Figure 2-2: Storm Sewers and Track Subdrains with Swale

2.1.7.3 *Conveyance System Option 3 – Open Ditch with Lock Block Retaining Wall*

This option is similar to Option 1 by using an open ditch. However, this option differs in that a lock block wall would be installed along the Barrie rail corridor ROW adjacent to the residential properties, as shown in Figure 2-3. This allows the proposed ditch cross section to occupy all of the space provided on the ROW. An open ditch would be constructed using the same depths as in Option 1, yet the full 1.2 metre standard width would be used with 2:1 sideslopes thereby providing more than adequate drainage capacity. This option will provide the most practical and economic solution since it allows for the greatest drainage capacity and avoids the expense of storm sewer construction and maintenance, as well as property acquisition.

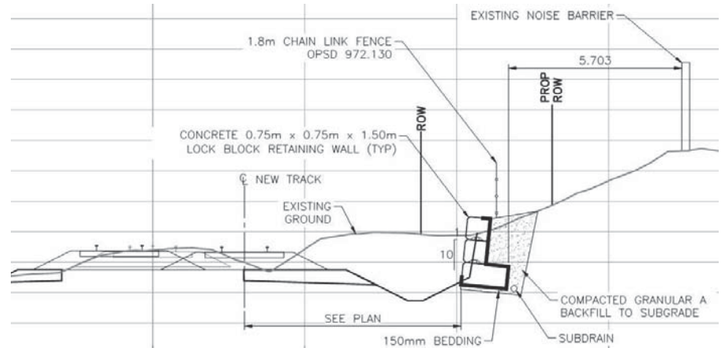

Figure 2-3: Open Ditch with Lock Block Wall

The stormwater runoff along the Barrie rail corridor will be conveyed through one of the previous three design conveyance options described above. In addition to conveyance measures, a variety of stormwater management (SWM) measures will be explored to provide stormwater control within the rail corridor.

Through the hydrologic analysis within the proposed corridor for the track design conditions, a combination of SWM facilities will be required to properly convey and treat the runoff. The following can be drawn from the ROW hydrologic analysis for the preferred design of the corridor:

- Low Impact Development (LID) in the form of soakaway pits will be implemented where there is not a clearly defined outlet configuration;
- Preferred design and location for SWM facilities are subject to change based on soil boring test results and infiltration capacities of these soils;
- Conveyance system design is not recommended to significantly alter the existing drainage pattern;
- Enhanced grass swales are recommended to be implemented along conveyance ditches where applicable; and
- Within the ditching along the corridor, consider utilizing ditch check dams throughout the corridor to reduce runoff velocity and promote water quality filtration, settling and a reduction of potential downstream impacts.

2.1.8 *Utility Crossings*

Within the 60 mile study limits, the existing Barrie rail corridor intersects numerous utilities. These utilities include hydro, gas, telecommunication cables, traffic and street lighting cables, as well as municipal watermains and sewers. As such, it is recognized that the proposed corridor expansion work, and associated construction activities, will have an impact on these existing utilities. Preliminary investigation of the existing crossing agreements provided by Metrolinx identified 1,522 utility crossings over the Barrie rail corridor.

The existing utility information was obtained by completing a full utility circulation (request for markups) and was used to carry out a Subsurface Utility Engineering (SUE) investigation between Mile 3.00 and Mile 63.00 as identified in the Preferred Design Rail Corridor Plans (Drawings SK-C-001 - SK-C-144) which are appended to this EPR. The Subsurface Utility information will be cross-referenced with the crossing agreements provided by Metrolinx to check for discrepancies in the record information as part of the detailed design phase.

Table 2-8 summarizes the approximate number of utility crossings in each municipality based on the crossing agreements provided by Metrolinx. In addition, Metrolinx-owned utilities and utilities running parallel to the corridor will need to be considered prior to Project construction, but are not included in Table 2-8.

The approximate number of utility crossings provided in Table 2-8 does not include any agreements which have missing, unclear or unknown mileage. For the Barrie rail corridor there are approximately 120 of such crossings. The existence of an agreement does not necessarily represent a conflict; an agreement also may not represent an in-service utility crossing if the agreement document is no longer valid. Inconsistencies between the agreement information provided by Metrolinx and the information obtained from the utility circulation will be investigated as part of the detailed design phase.

Table 2-8: Utilities Overview

Region	Municipality	Mileage	Approx. No. of Utility Crossings
City of Toronto	City of Toronto	3.00 – 12.90	291
York Region	City of Vaughan	12.90 – 22.50	289
	Township of King	22.50 – 26.49 39.66 – 40.99	99 53
	Town of Aurora	26.49 – 31.50	199
	Town of Newmarket	31.50 – 35.37	237
	Town of East Gwillimbury	35.37 – 39.66	107
Simcoe County	Town of Bradford West Gwillimbury	40.99 – 47.72	99
	Town of Innisfil	47.72 – 58.45	123
	City of Barrie	58.45 – 63.00	25

2.1.9 *Noise Mitigation*

Rowan Williams Davies and Irwin Inc. (RWDI) assessed the need for noise mitigation along the Barrie rail corridor. Sensitive receptors were evaluated and a noise barrier (wall) with a maximum height of 5 metres proposed along areas requiring noise mitigation. In some areas, there are existing noise walls that do not meet the 5 metre height and therefore, these areas will need to be re-evaluated to determine if the additional height is required. In other cases, noise walls may not be required, but will only be determined based upon a site-specific assessment. Some modifications have been made to the RWDI design in the preferred design plans, and noise wall heights are to be confirmed through an optimization process to be completed during the detailed design phase.

2.1.10 *Retaining Walls*

The construction of the proposed second track requires installation of retaining walls in some areas along the Barrie rail corridor to protect against property encroachment. The following is an outline of the retaining walls required for the BRCE Project, which has involved consideration of the following wall types:

- Lock Block Wall – concrete blocks that are stacked to create retaining walls;
- Precast Concrete Lagging with Cantilevered Soldier Pile;
- Precast Concrete Lagging with Soldier Pile and Tieback; and
- Sheet Pile.

There is a total length of 10,130 metres of retaining wall proposed along the length of the corridor. The proposed retaining walls are identified in Preferred Design Rail Corridor Plans (Drawings SK-C-001 - SK-C-144) appended to this EPR and include:

- A total of 2,455 metres of retaining walls proposed within the City of Toronto including lock block, pile and lagging, precast concrete lagging with cantilevered soldier piles and sheet pile wall types. It is noted that the section of the Barrie rail corridor situated between Mile 3.91 and Mile 4.87 within the City of Toronto was not considered, as it is part of the Davenport Diamond Grade Separation project which was planned and assessed through a separate TPAP;
- A total of 4,900 metres of retaining walls proposed within York Region including lock block, precast concrete lagging with cantilevered soldier piles, and sheet pile wall types; and
- A total of 2,775 metres of primarily precast concrete lagging with cantilevered soldier piles wall types proposed within Simcoe County and the City of Barrie.

2.1.11 *Property Acquisition*

A project objective established at the beginning of the preferred design was to develop design scenarios which would minimize the requirement to acquire privately held property. For the most part, the proposed second track can be completely constructed within the existing ROW. However, construction of the trackbed cannot always be accommodated within the existing ROW as some of the areas are in high fill sections, low cut sections or adjacent to natural heritage, cultural or archaeological constraints or existing property. In addition, embankments and trackbed construction may be wider that the actual land remaining on the Metrolinx property. In other cases, the alignment of the second track is further away from the existing mainline than the minimum due to grade separations or station configurations.

Based on the above, privately held property will be required to complete the Project work, however details of property purchase will not be confirmed until the detailed design phase. Prior to Project construction, each affected property owner will be contacted by Metrolinx to discuss possible property purchase.

Public entities also own numerous parcels of property which abut Metrolinx's property. Rather than construct expensive retaining walls to support embankment widening within Metrolinx property, it is proposed that sufficient property be purchased from these public entities to allow side slopes to run out to existing ground levels. These slopes can then be landscaped in a manner acceptable to the affected public entity and Metrolinx.

Areas of proposed property acquisition to accommodate the rail infrastructure will be further refined and confirmed prior to Project construction, during the detailed design phase. Property requirements for the preferred design are discussed further in Section 4 of this EPR and provided in the Socio-Economic and Land Use Characteristics Report, which is located within Appendix F of this EPR.

2.2 GO Station Improvements

To implement the preferred design of an expanded commuter rail service along the Barrie rail corridor, various modifications are proposed for a number of the existing GO Stations along the corridor. Descriptions of these existing GO Stations along with the proposed modifications are discussed below. For the purpose of this EPR, conceptual plans have been prepared for the GO Stations where upgrades are proposed. These drawings are included in this section and highlight the areas for discussion and consideration by the design disciplines when progressing to detailed design and construction.

The TPAP for the BRCE Project includes improvements to the existing Rutherford, Maple, King City, Aurora, Newmarket, East Gwillimbury, Bradford, Barrie South and Allandale Waterfront GO Stations to accommodate the new track.

It is noted that upgrades at the Rutherford, Maple, King City, Aurora, Newmarket, and East Gwillimbury GO Stations are currently being completed separately to the BRCE Project. All station works at these locations are classified as Deemed Approved (Group A) projects under the GO Transit Class EA process and are exempt from requiring a focused impact assessment under the TPAP since the scope involves construction/modifications of existing station infrastructure. Potential effects have been reviewed and considered as part of these separate projects and mitigation and monitoring activities will be implemented at these stations, as required. The Preferred Design Plans for these six existing stations as well as the future Downsview Park GO Station and Caledonia GO Station have been incorporated into the Preferred Design Rail Corridor Plans (Drawings SK-C-001 - SK-C-144) appended to this EPR.

2.2.1 *Design Criteria*

To accommodate the GO Expansion program along the Barrie rail corridor, preliminary design work was performed on the station modifications in accordance with the Metrolinx DRM as well as applicable codes, standards, specifications and guidelines of all authorities having jurisdiction. Details regarding the proposed GO Station modifications are provided below for each specific station.

2.2.2 *Rutherford GO Station – Mile 16.70*

The existing Rutherford GO Station is located within the City of Vaughan, York Region, and is situated east of the Rutherford Road and Keele Street intersection. The existing 12-car accessible platform, station building and parking lot are located along the west side of the rail corridor. The existing parking lot can accommodate 978 vehicles and includes a Kiss & Ride area as well as a bus loop and accessible parking. The existing Rutherford GO Station has one mainline track that is accessed from the west side platform.

Lands west and south of the station are generally industrial and lands north of the GO Station and on the east side of the railway corridor are residential with a parcel of conservation land which includes the Westminster Creek (tributary of the West Don River). The track through the station limits is generally straight as illustrated in Photo 2-1 and Photo 2-2.

For expanded service, the existing platform will be maintained and station improvements will include an additional side platform and second track. The designs for the expansion of the Rutherford GO Station are based in part on the design used for the Exhibition GO Station on the Lakeshore West line. This includes construction of a second single side platform on the opposite side of the corridor across from the existing platform. Each platform will be constructed with enough space to allow for a future third track expansion between the two existing outer tracks such that all tracks are between the two edge platforms. The two outer tracks would be served by the corresponding platforms. A summary of the recommended improvements is provided in Table 2-9 below, and illustrated in Figure 2-4.

Photo 2-1: Rutherford GO Station aerial image

Photo 2-2: Rutherford GO Station looking north - side platform

Table 2-9: Rutherford GO Station Design Recommendations

Discipline	Design Element Recommendation
Civil	New side platform
	Rehabilitated existing side platform
	New and replacement platform shelters
	Associated grading and drainage
Structural	Above grade electrical, communications and mechanical bunker
	Two tunnels with stair enclosures and partial platform canopies
Mechanical	Snowmelt system for new platform and replacement snowmelt system on existing platform
	Elevators at both tunnels
Electrical	New transformer
	Expanded lighting, PA, Closed-circuit TV (CCTV) and fare systems
	Grounding and bonding considerations and provisions for future electrification

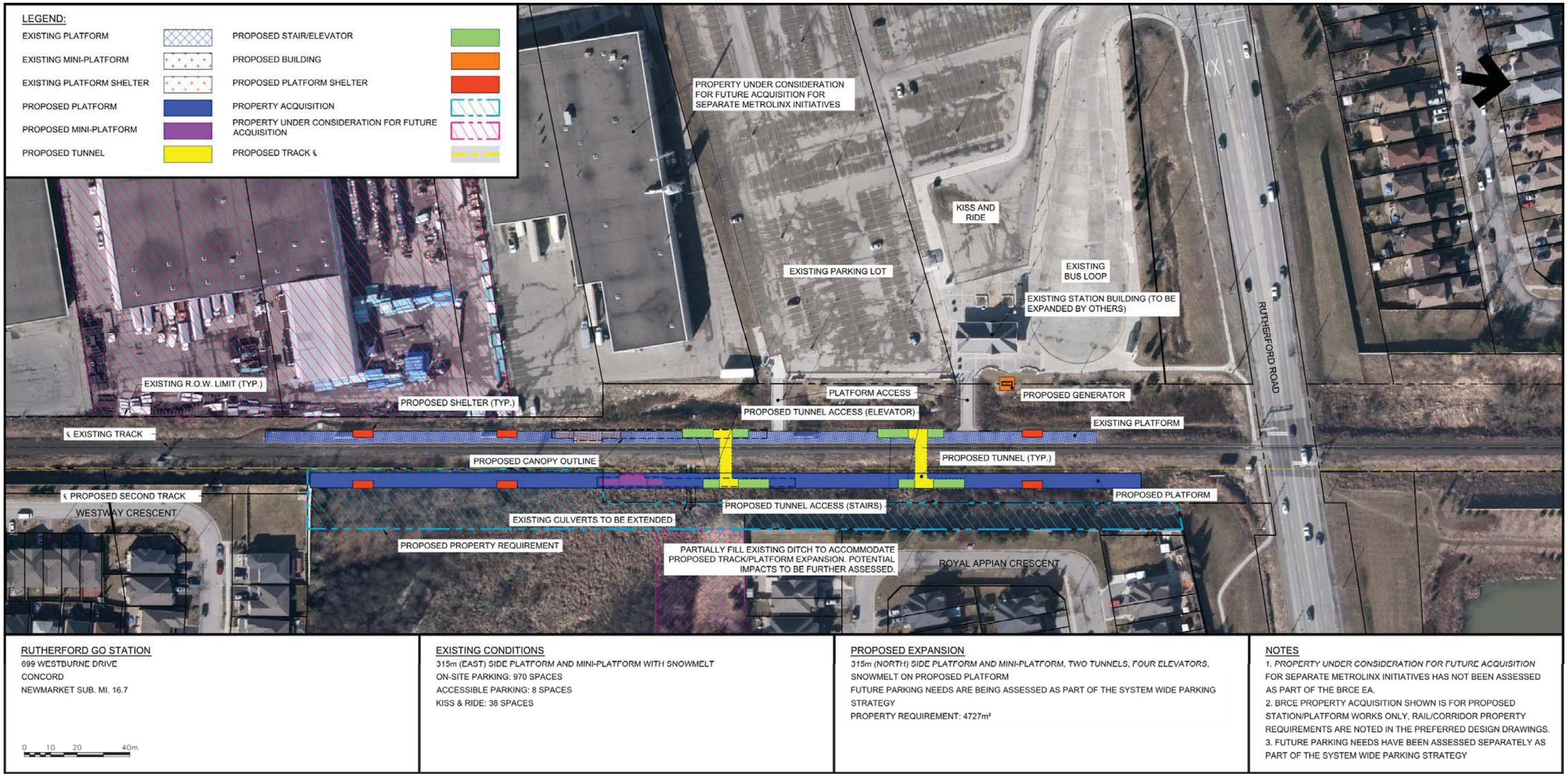

Figure 2-4: Illustration of the Rutherford GO Station Conceptual Plan Improvements

2.2.3 *Maple GO Station – Mile 18.30*

The existing Maple GO Station is located within the City of Vaughan, York Region, and is situated east of the intersection of Keele Street and Major Mackenzie Drive. The existing 12-car accessible platform, station building and parking lot are located along the east side of the rail corridor. The existing parking lot can accommodate 1,239 vehicles and includes a Kiss & Ride area as well as a bus loop and accessible parking. The existing Maple GO Station has one mainline track that is accessed from the east side platform.

Lands adjacent to the station building on the east side of the corridor are existing/planned commercial. Lands south of the station and on the west side of the rail corridor are residential. The track through the station limits is on a slight curve with a radius of approximately 1,700 metres as illustrated in Photo 2-3 and Photo 2-4.

For expanded service, the existing platform will be maintained and station improvements will include an additional side platform and second track. Similar to the Rutherford GO Station, the designs for the expansion of the Maple GO Station include construction of a second single side platform on the opposite side of the corridor across from the existing platform. Each platform will be constructed with enough space to allow for a future third track expansion between the two existing outer tracks such that all tracks are between the two edge platforms. The two outer tracks would be served by the corresponding platforms. Table 2-10 below provides a summary of the recommended improvements, which are illustrated in Figure 2-5.

Table 2-10: Maple GO Station Design Recommendations

Discipline	Design Element Recommendation
Civil	New side platform
	Rehabilitated existing side platform
	New and replacement platform shelters
	Associated grading and drainage
Structural	Above grade electrical, communications and mechanical bunker
	Two tunnels with stair enclosures and partial platform canopies
Mechanical	Snowmelt system for new platform and existing platform
	Elevators at both tunnels
Electrical	Expanded lighting, PA, CCTV and fare systems
	Grounding and bonding considerations and provisions for future electrification

Photo 2-3: Maple GO Station aerial image

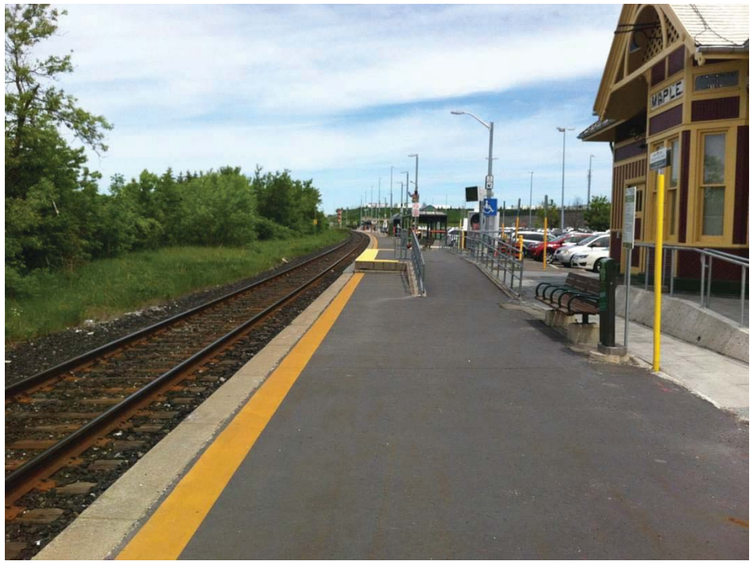

Photo 2-4: Maple GO Station looking north - side platform

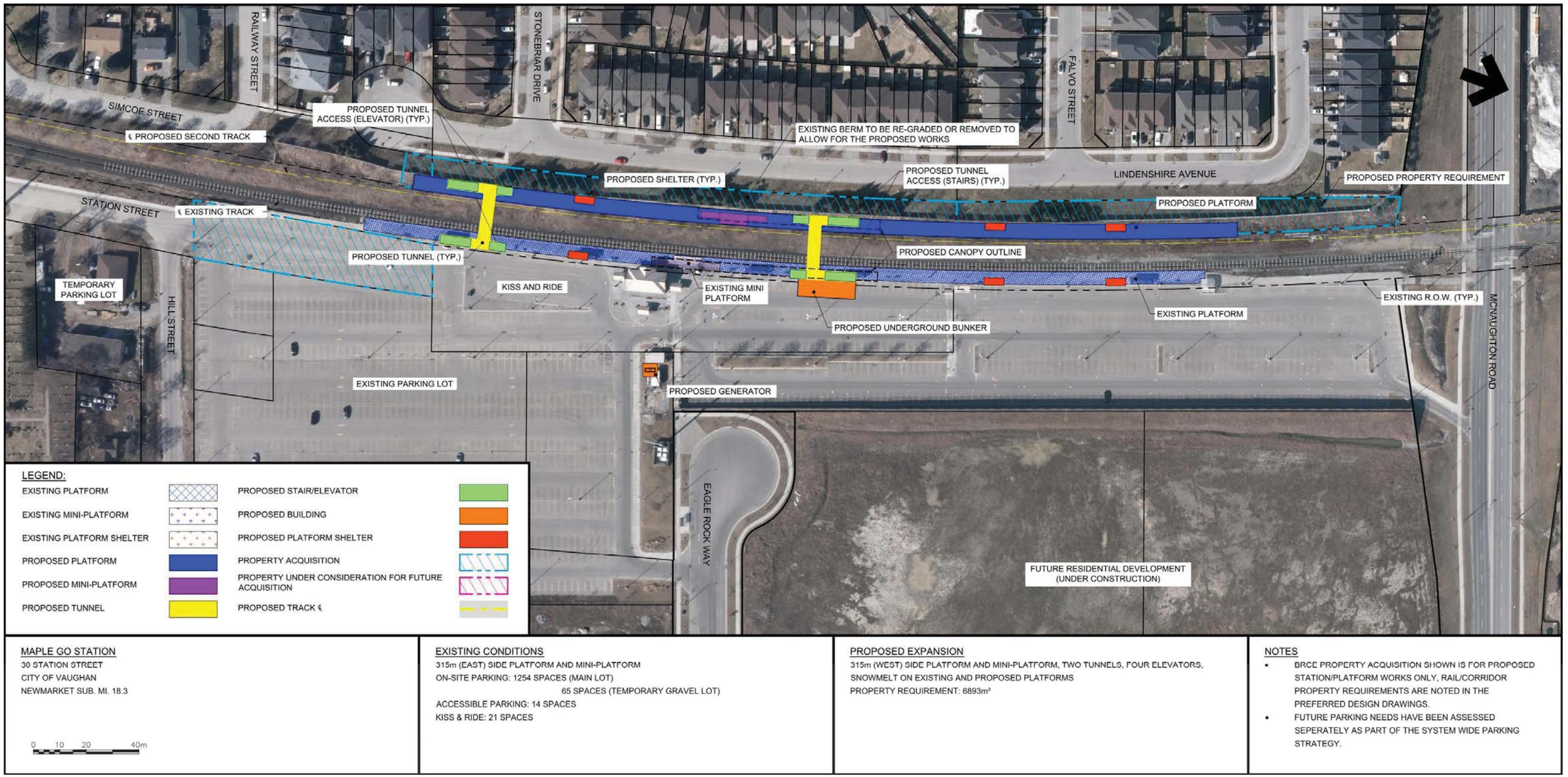

Figure 2-5: Illustration of the Maple GO Station Conceptual Plan Improvements

2.2.4 *King City GO Station – Mile 22.70*

The existing King City GO Station is located within the Township of King, York Region, and is situated south of the intersection of King Road and Keele Street. The existing 12-car accessible platform, station building and parking lot are located along the west side of the rail corridor. The existing parking lot includes accessible parking and can accommodate 468 vehicles[13]. There is currently no Kiss & Ride facility at this location and the bus access is adjacent to the station's main parking lot on Keele Street. The existing King City GO Station has one mainline track that is accessed from the east side platform.

Lands surrounding the station building and parking lots are generally residential or part of the provincially significant King-Vaughan Wetland Complex including a tributary of the East Humber River. The track through the station limits is generally straight as illustrated in Photo 2-5 and Photo 2-6

For expanded service, the existing platform will be maintained and station improvements will include an additional side platform and second track. Similar to the Rutherford GO Station, the designs for the expansion of the King City GO Station includes construction of a second single side platform on the opposite side of the corridor across from the existing platform. Each platform will be constructed with enough space to allow for installation of a future third track expansion between the two existing outer tracks such that all tracks are between the two edge platforms. The two outer tracks would be served by the corresponding platforms. A summary of the recommended improvements is provided in Table 2-11 below, and are illustrated in Figure 2-6.

Table 2-11: King GO Station Design Recommendations

Discipline	Design Element Recommendation
Civil	New side platform
	Rehabilitated existing side platform
	New and replacement platform shelters
	Associated grading and drainage
Structural	Above grade electrical, communications and mechanical bunker
	Concrete box culvert extension
	Two new pedestrian bridges with stair cases and elevators
Mechanical	Snowmelt system for new platform and existing platform
	Elevators at both tunnels
Electrical	Expanded lighting, PA, CCTV and fare systems
	Grounding and bonding considerations and provisions for future electrification

Photo 2-5: King City GO Station aerial image

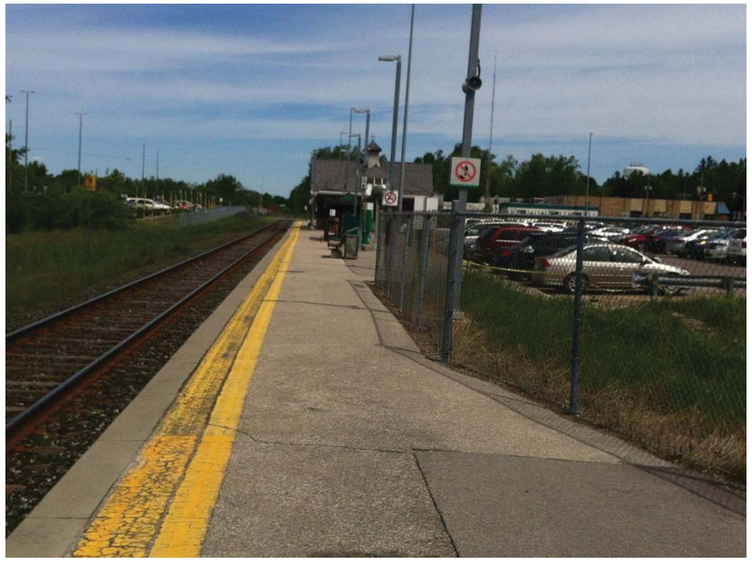

Photo 2-6: King City GO Station looking north - side platform

[13] *Since this assessment commenced, parking has been expanded at the King City GO Station and now includes space for 555 vehicles split over 5 separate lots (240 parking spaces at main lot, 70 north lot, 120 south lot, 40 King City United Church lot, and 85 at 55 Station Road).*

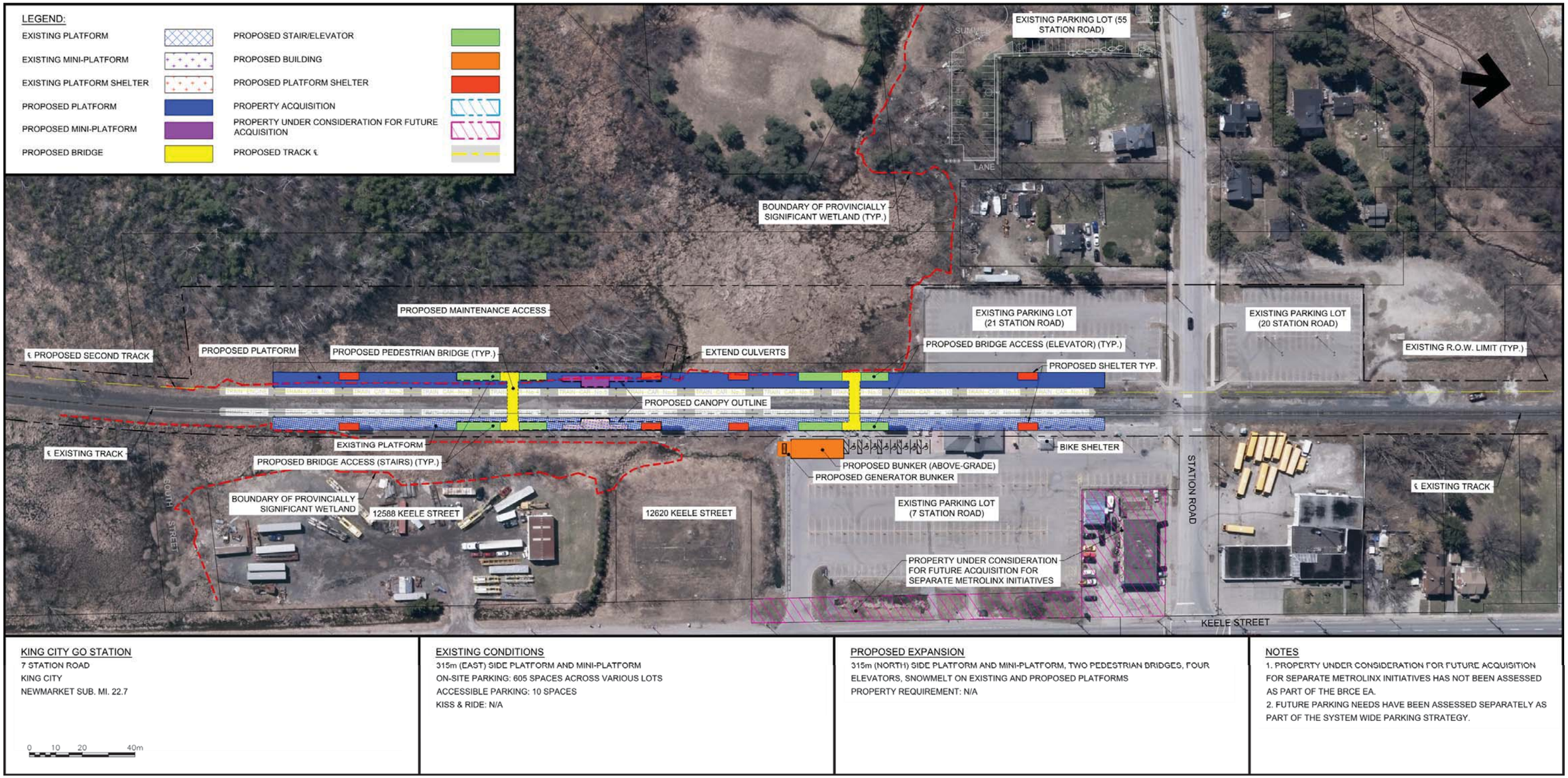

Figure 2-6: Illustration of the King City GO Station Conceptual Plan Improvements

2.2.5 *Aurora GO Station – Mile 29.90*

The existing Aurora GO Station is located within the Town of Aurora, York Region, and is situated east of the intersection of Wellington Street East and Yonge Street. The existing 12-car accessible platform, station building, Kiss & Ride, bus loop and accessible parking are located along the east side of the rail corridor, with the main parking lot located on the west. The existing parking lots can accommodate 1,464 vehicles. The existing Aurora GO Station has one mainline track that is accessed from the east side platform.

Lands adjacent to the station building are industrial and on the east side of the rail corridor land use is primarily residential with some commercial properties. The track through the station limits is generally straight as illustrated in Photo 2-7 andPhoto 2-8.

For expanded service, the existing east side platform will be maintained and a new west island platform constructed to serve the new second track and the proposed pocket track. This will result in a smaller car parking area. Table 2-12 below summarizes the recommended improvements, which are illustrated in Figure 2-7.

Table 2-12: Aurora GO Station Design Recommendations

Discipline	Design Element Recommendation
Civil	New island platform
	Rehabilitated existing side platform with new mini-platform
	New and replacement platform shelters
	Associated grading and drainage
Structural	Above grade electrical, communications and mechanical bunker
	Two tunnels with stair enclosures and partial platform canopies
Mechanical	Snowmelt system for new platform and existing platform
	Elevators at both tunnels
Electrical	Expanded lighting, PA, CCTV and fare systems
	Grounding and bonding considerations and provisions for future electrification

Photo 2-7: Aurora GO Station aerial image

Photo 2-8: Aurora GO Station looking north - side platform

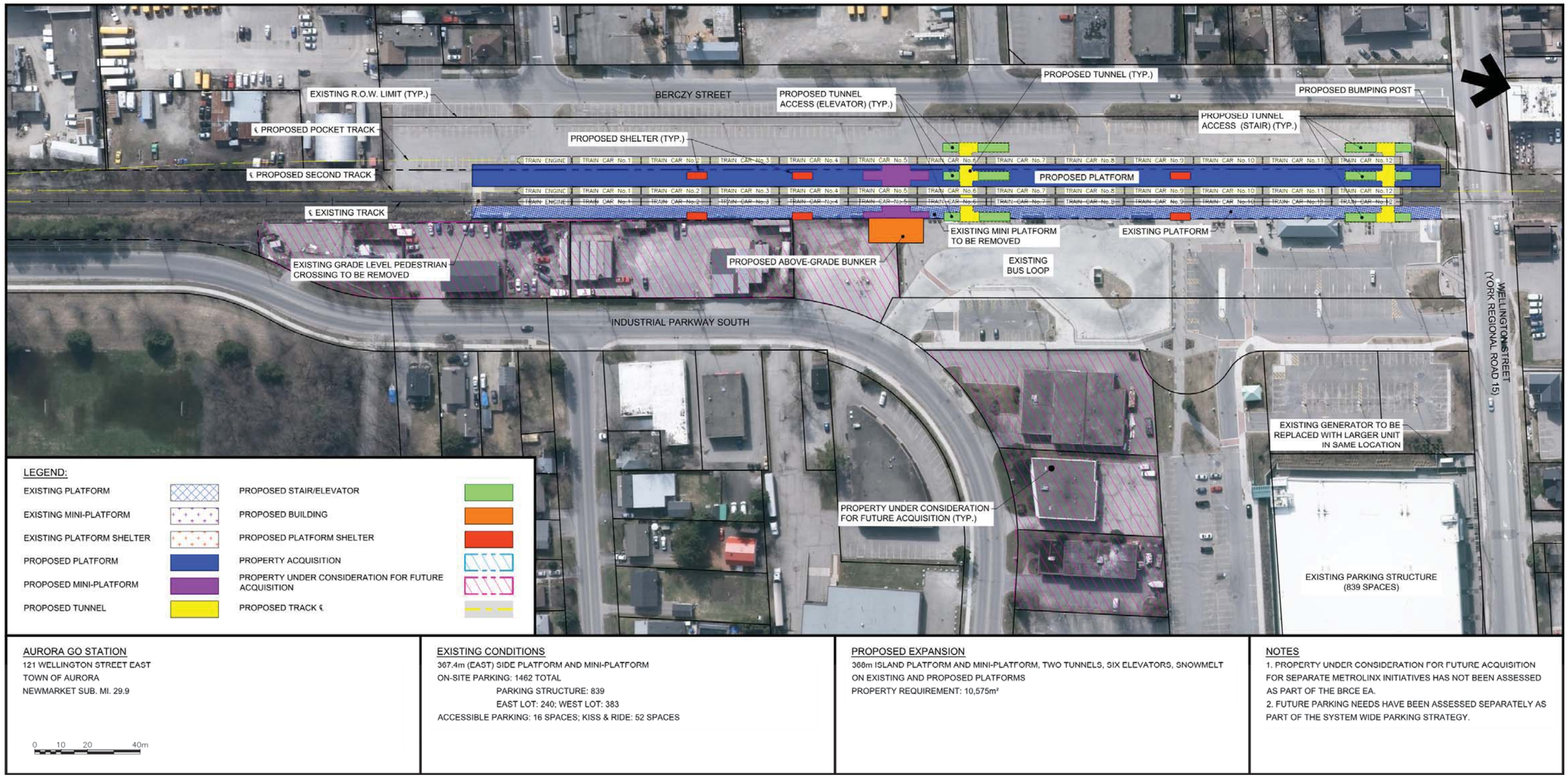

Figure 2-7: Illustration of the Aurora GO Station Conceptual Plan Improvements

2.2.6 *Newmarket GO Station – Mile 34.20*

The existing Newmarket GO Station is located within the Town of Newmarket, York Region, and is situated east of the intersection of Main Street North and Davis Drive (Highway 9). The existing 12-car accessible platform, station building and parking lot are located along the east side of the rail corridor. The existing parking lot includes accessible parking and can accommodate 265 vehicles. The Newmarket GO Station has one mainline track that is accessed from the east side platform.

Adjacent to the station building and parking lot on the east of the corridor, north of Davis Drive, is the Mabel Davis Conservation Area which includes the Nokiidaa bike trail and a tributary of the East Holland River. South of Davis Drive, on the east of the Barrie rail corridor, there is mixed use residential and commercial land. Land on the west side of the rail corridor is primarily residential. The track through the station limits is unusual in that the existing alignment is curved with an approximate radius of 600 metres as shown in Photo 2-9 and Photo 2-10.

Table 2-13 below provides a summary of the recommended improvements. As noted therein, to facilitate the expanded service, the existing platform will be maintained and station improvements will include an additional side platform and second track. CCTV cameras with displays at the mini-platform will be required to allow the train crew to visually confirm, around the curved track, that the car doors are clear prior to the train leaving the station; mirrors may be considered prior to construction for redundancy. The recommended improvements are illustrated in Figure 2-8.

Table 2-13: Newmarket GO Station Design Recommendations

Discipline	Design Element Recommendation
Civil	New side platform
	Rehabilitated existing side platform
	New and replacement platform shelters
	Associated grading and drainage
Structural	Above grade electrical, communications and mechanical bunker
	One tunnel with stair enclosure
Mechanical	Snowmelt system for new platform and existing platform
	Elevators at tunnel
Electrical	New transformer
	Expanded lighting, PA, CCTV and fare systems
	CCTV with display to allow train doors to be visually cleared on curved platform
	Grounding and bonding considerations and provisions for future electrification

Photo 2-9: Newmarket GO Station aerial image

Photo 2-10: Newmarket GO Station looking south - side platform

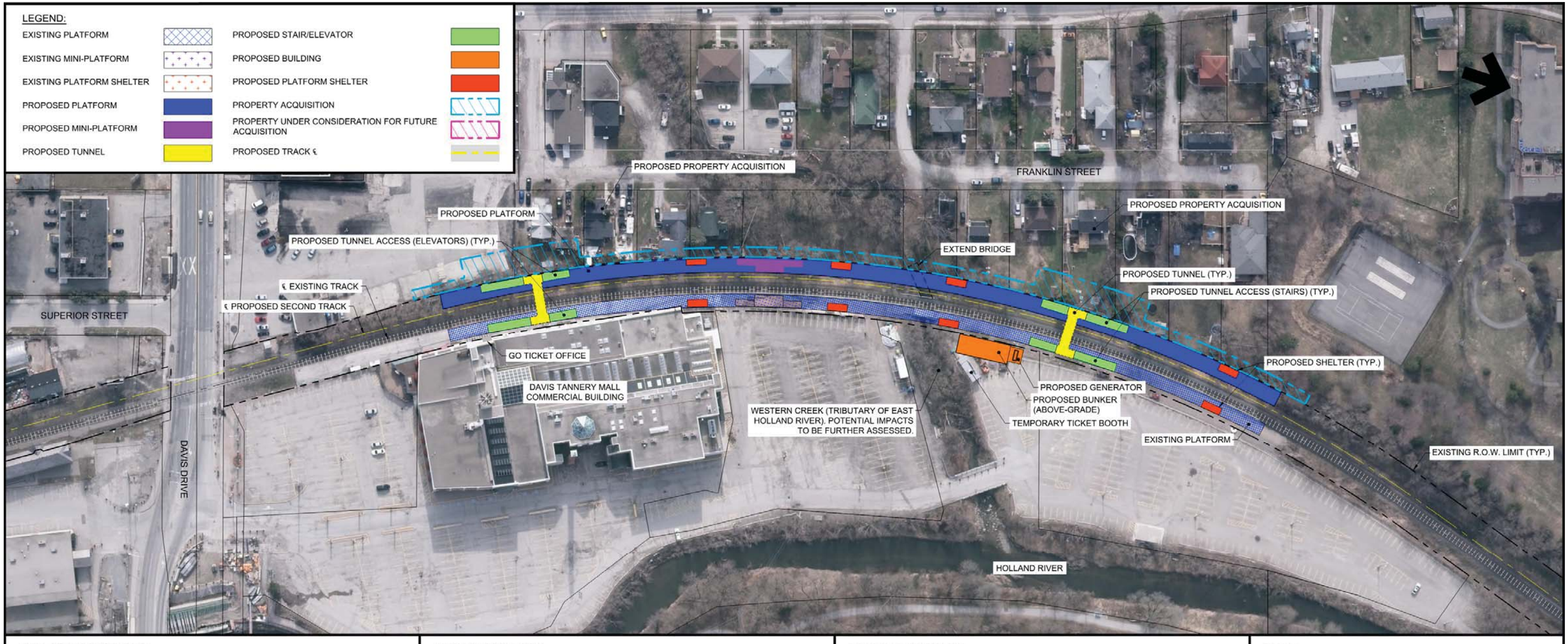

Figure 2-8: Illustration of the Newmarket GO Station Conceptual Plan Improvements

2.2.7 *East Gwillimbury GO Station – Mile 35.50*

The existing East Gwillimbury GO Station is located within the Township of East Gwillimbury, York Region, and is situated east of the intersection of Main Street North and Green Lane East. The existing 12-car accessible platform, station building and parking lot are located along the west side of the rail corridor. The existing parking lot can accommodate 636 vehicles and includes a Kiss & Ride area as well as a bus loop and accessible parking. The East Gwillimbury GO Station has one mainline track that is accessed from the west side platform.

Lands on either side of the rail corridor to the south of the station are residential, and lands to the north and west of the station is currently agricultural, but are designated as a community area in the East Gwillimbury OP. The Rogers Reservoir Conservation Area including the Nokiidaa bike trail and a tributary of the East Holland River is located on the east side of the rail corridor. The track through the station limits is generally straight as illustrated in Photo 2-11 and Photo 2-12.

For two-way all day service, the existing platform will be maintained and station improvements will include an additional side platform and second track. Table 2-14 below summarizes the recommended improvements, which are shown in Figure 2-9.

Table 2-14: East Gwillimbury GO Station Design Recommendations

Discipline	Design Element Recommendation
Civil	New side platform
	Rehabilitated existing side platform
	New and replacement platform shelters
	Associated grading and drainage
Structural	Above grade electrical, communications and mechanical bunker
	Two tunnels with stair enclosures and partial canopies
Mechanical	Snowmelt system for new platform and existing platform
	Elevators at both tunnels
Electrical	New transformer
	Expanded lighting, PA, CCTV and fare systems
	Grounding and bonding considerations and provisions for future electrification

Photo 2-11: East Gwillimbury GO Station aerial image

Photo 2-12: East Gwillimbury GO Station looking north - side platform

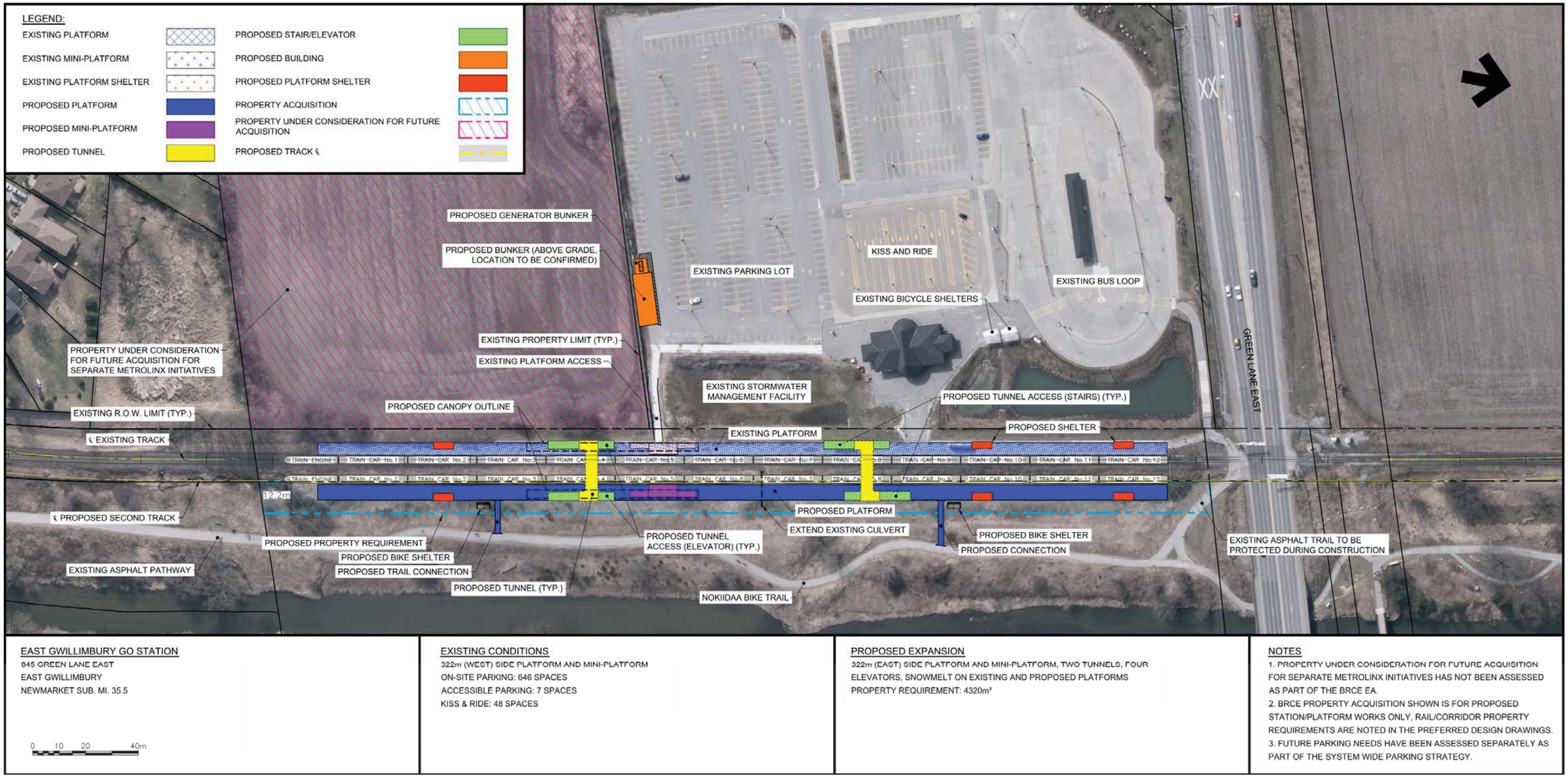

Figure 2-9: Illustration of the East Gwillimbury GO Station Conceptual Plan Improvements

2.2.8 *Bradford GO Station – Mile 41.50*

The existing Bradford GO Station is located within the Town of Bradford West Gwillimbury, County of Simcoe, and is situated north-east of the Dissette Street and Bridge Street (Highway 11) intersection. The century-old wooden station building and parking lot (including accessible parking) are located on the west side of the Barrie rail corridor connected by a pedestrian tunnel to the 12-car accessible side platform on the east side. The existing parking lot can accommodate 355 vehicles[14] with a small Kiss & Ride and bus bay. The existing Bradford GO Station has two mainline tracks. The east mainline track is accessed via two level crossings. There is currently no access to the west mainline track, however there are the remains of a platform, mini-platform and 2-train layover that are not in service on the west side of the tracks, at the north of the station.

Lands west of the station building are generally commercial and are proximate to downtown Bradford. Lands east of the tracks are agricultural and include a portion of the provincially significant Holland Marsh Wetland Complex. Much of the land on both sides of the GO Station is mapped within the LSRCA regulated area[15] associated with the West Holland River. The track through the station limits is unusual in that the existing alignment is curved with an approximate radius of 575 metres. This is illustrated in Photo 2-13 and Photo 2-14.

Photo 2-13: Bradford GO Station aerial image

Photo 2-14: Bradford GO Station looking north - side platform

For expanded service, the existing platform will be maintained and station improvements will include an additional side platform and second track. An elevator and tunnel from the station building to a new elevator directly across the tracks provides an efficient route for customers with accessibility needs. A second tunnel with elevators is proposed to serve the north portion of the east platform. The existing level crossing at the south end of the platform will be maintained but gated and will provide a redundant accessible path in the event of the failure of one or more of the elevators.

Parking is to be reconfigured to allow for a larger Kiss & Ride and the proposed station expansion. The proposed station expansion will increase station functionality and house the snowmelt system boiler room. CCTV cameras with displays at the mini-platform will be required to allow the train crew to visually confirm, around the curved track, that the car doors are clear prior to the train leaving the station; mirrors may be considered prior to construction for redundancy.

Table 2-15 below provides a summary of the recommended improvements, which are illustrated in Figure 2-10

[14] *Since this assessment commenced, work in the parking area at the Bradford GO Station has occurred. There are now 359 parking spaces.*

[15] *Regulated areas are those areas confirmed by the LSRCA to be prone to flooding for example, or to contain sensitive natural heritage features that warrant protection. They include, but are not limited to wetlands or lands beside wetlands, lands subject to shoreline erosion, stable and unstable stream valleys, watercourses, slopes, and applicable setback areas. As they are vulnerable areas, they are regulated to ensure changes to these landscapes will not result in loss of life, property damage, or social disruption, and will not have an adverse effect on natural heritage features (e.g., wetlands and other environmentally sensitive areas).*

Table 2-15: Bradford GO Station Design Recommendations

Discipline	Design Element Recommendation
Civil	New side platform
	Rehabilitated existing side platform
	New platform shelters to complement existing
	Expanded and re-oriented Kiss & Ride
	Associated grading and drainage
Structural	Station building expansion
	Above grade electrical, communications and mechanical bunker
	Two tunnels with stair enclosures
Mechanical	Snowmelt system for new platform and existing platform
	Elevators at both tunnels
Electrical	New transformer
	New Generator
	Expanded lighting, PA, CCTV and fare systems
	CCTV with display to allow train doors to be visually cleared on curved platform
	Grounding and bonding considerations and provisions for future electrification

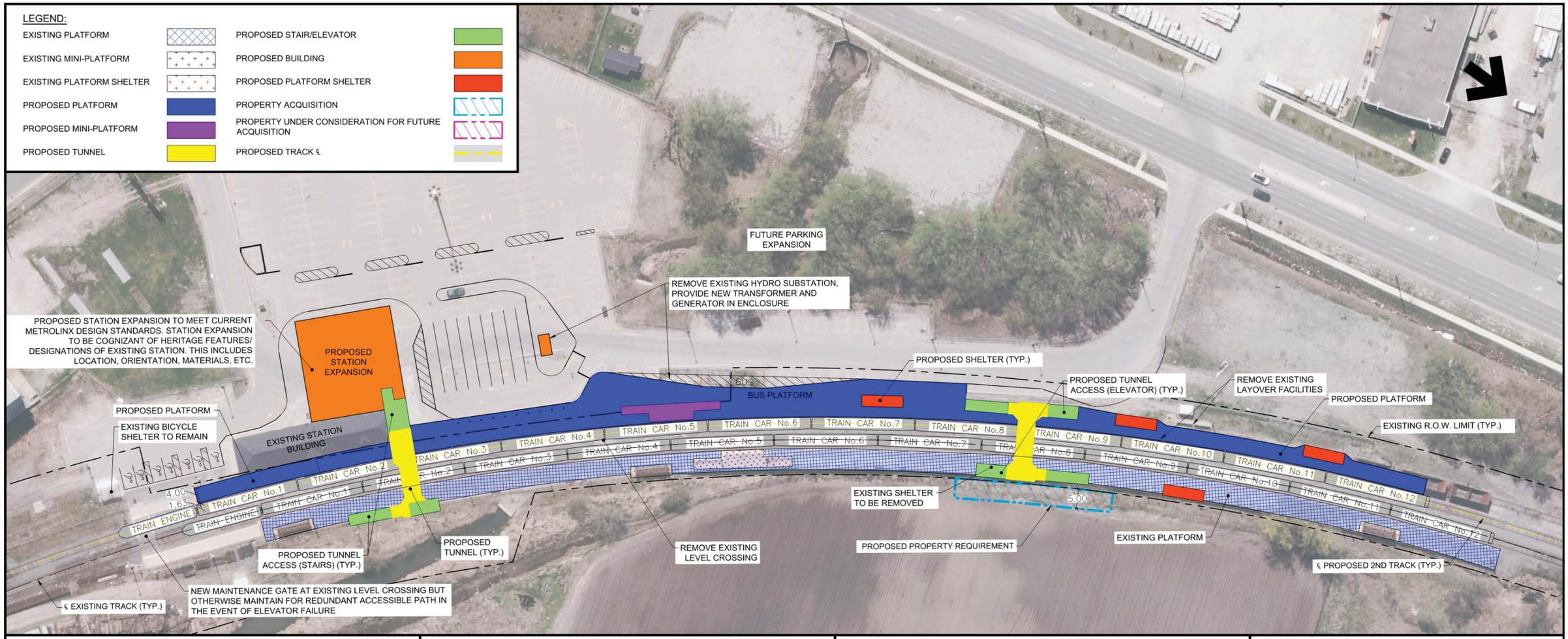

Figure 2-10: Illustration of the Bradford GO Station Conceptual Plan Improvements

2.2.9 *Barrie South GO Station – Mile 59.50*

The existing Barrie South GO Station is located within the City of Barrie, and is situated north of the intersection of Yonge Street and Mapleview Drive East. The existing 12-car accessible platform, relatively new station building and parking lot are located along the south-west side of the rail corridor. The existing parking lot can accommodate 619 vehicles and includes a Kiss & Ride area as well as a bus loop and accessible parking. The Barrie South GO Station has one mainline track that is accessed from the west side platform. While development is proposed near the east side of the station, the surrounding area is generally undeveloped, as illustrated in Photo 2-15 and Photo 2-16.

For expanded service, the existing platform will be maintained and station improvements will include an additional side platform and second track. It is noted that the additional footprint required by the new platform does not impact the station site. The site can accommodate stair and elevator enclosures for new tunnels to a new accessible 12-car side platform on the north-east side of the tracks. There will be some minor parking spaces lost to accommodate a boiler room for the new snowmelt building, noting that the existing lot is not at capacity and there is room to expand parking on-site in the future. Table 2-16 below provides a summary of the recommended improvements. Figure 2-11 illustrates the Barrie South GO station conceptual plan improvements.

Table 2-16: Barrie South GO Station Design Recommendations

Discipline	Design Element Recommendation
Civil	New side platform
	Rehabilitated existing side platform
	New platform shelters to complement existing
Structural	Above grade mechanical bunker
	Two tunnels with stair enclosures
Mechanical	Snowmelt system for new platform and existing platform
	Elevators at both tunnels
Electrical	New Generator
	Expanded lighting, PA, CCTV and fare systems
	Grounding and bonding considerations and provisions for future electrification

Photo 2-15: Barrie South GO Station aerial image

Photo 2-16: Barrie South GO Station looking north - side platform

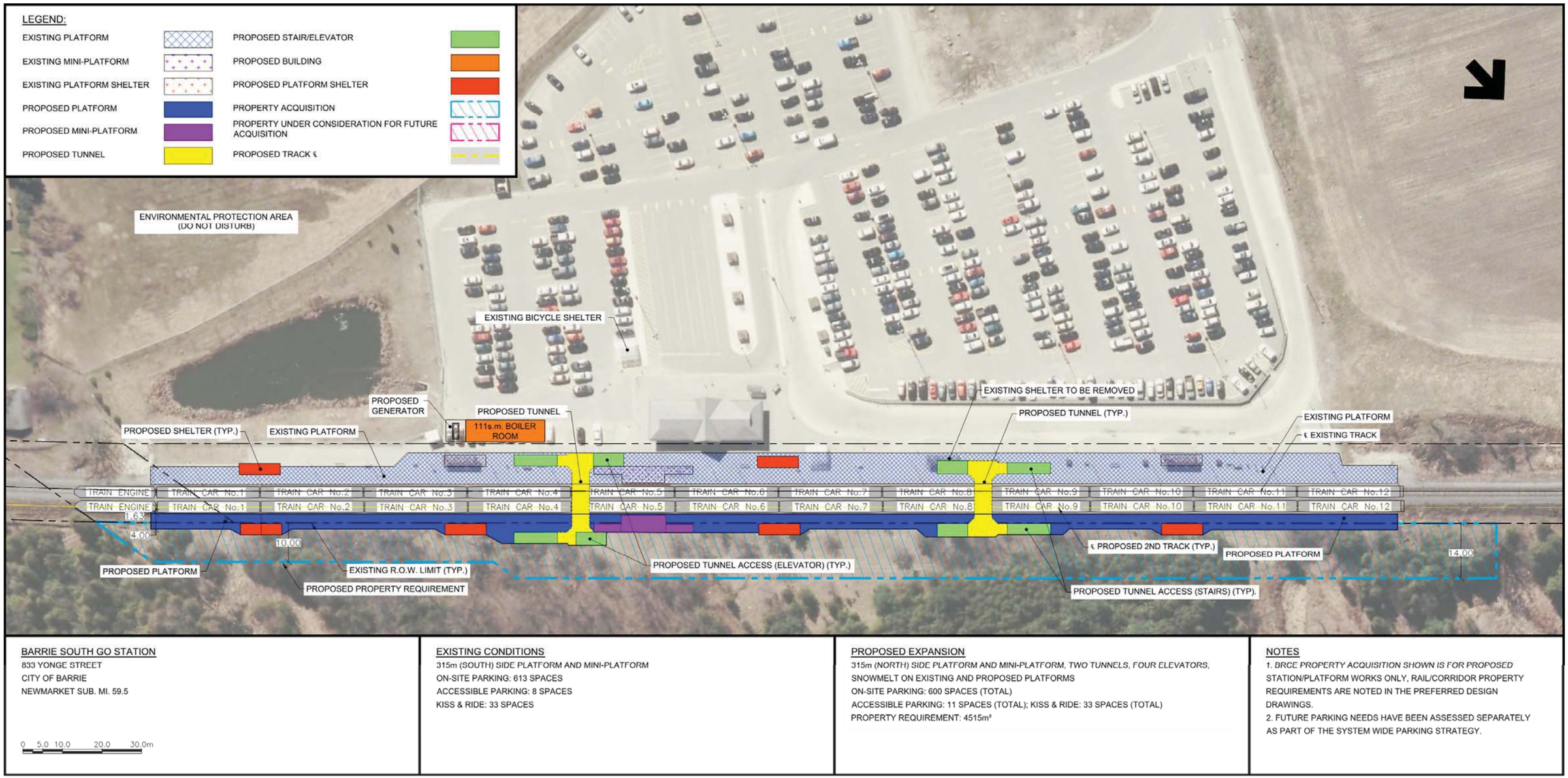

Figure 2-11: Illustration of the Barrie South GO Station Conceptual Plan Improvements ‘

2.2.10 *Allandale Waterfront GO Station – Mile 62.90*

The existing Allandale Waterfront GO Station is located within the City of Barrie, and is situated south of the intersection of Lakeshore Drive and Tiffin Street. The existing 12-car accessible platform, station building, accessible parking and shared City of Barrie/GO Transit bus bays are located along the north side of the Barrie rail corridor and connected by a ramped pedestrian tunnel to the parking lot on the south side of the rail corridor. The existing parking lot can accommodate 160 vehicles. At present, the Allandale Waterfront GO Station has two mainline tracks. The north mainline track is accessed from the north side platform and there is currently no access to the south mainline track. There is currently no station building other than a communications and electrical building and the tunnel ramp enclosures. The north ramp enclosure also contains an underground boiler room for the existing snowmelt system.

Lands adjacent to the station parking lot on the south side of the rail corridor are residential. Lands to the north, between the rail corridor and Kempenfelt Bay (Lake Simcoe) are typically undeveloped and comprised of green space or parkland, including the old Allandale train station. As illustrated in Photo 2-17 and Photo 2-18, the tracks through the station are generally straight.

To facilitate the expanded service, the existing platform will be maintained and station improvements will include an additional side platform to service the existing second track. At the Allandale Waterfront GO Station, the additional room required by the new south platform does not impact the station site. No new track crossings or parking is proposed. Subject to review prior to construction, the existing snowmelt boilers may have sufficient capacity to serve both the existing and proposed platform. Table 2-17 below provides a summary of the recommended improvements, which are shown in Figure 2-12.

Table 2-17: Allandale Waterfront GO Station Design Recommendations

Discipline	Design Element Recommendation
Civil	New side platform
	Rehabilitated existing side platform
	New platform shelters to complement existing
Structural	Reconstruct South Vestibule
Mechanical	Snowmelt system for new platform
Electrical	Expanded lighting, PA, CCTV and fare systems
	Grounding and bonding considerations and provisions for future electrification

Photo 2-17: Allandale Waterfront GO Station aerial image

Photo 2-18: Allandale Waterfront GO Station looking north - side platform

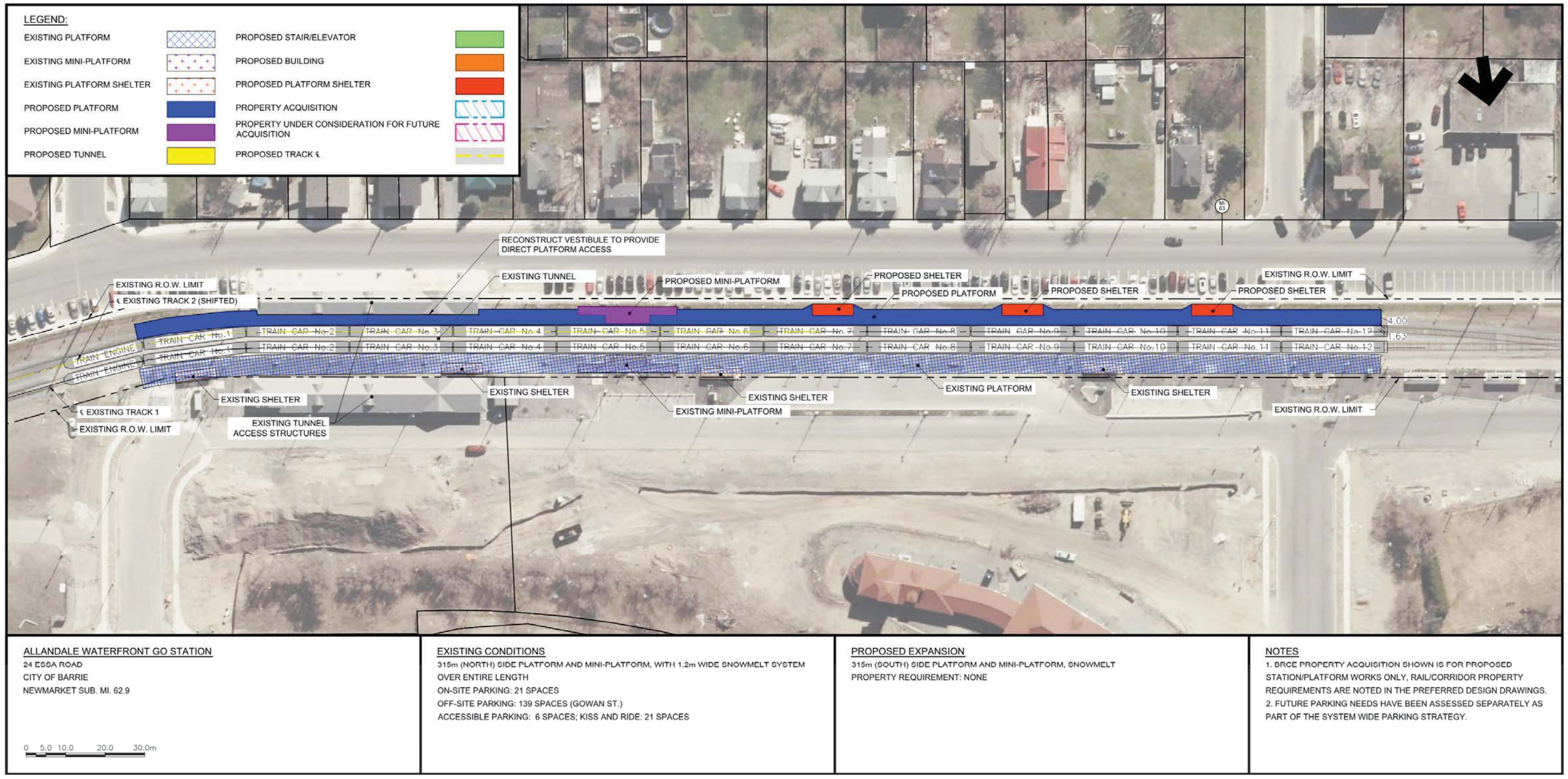

Figure 2-12: Illustration of the Allandale Waterfront GO Station Conceptual Plan Improvements

2.2.11 *Property Acquisition*

Property required to accommodate the proposed GO Station improvements will be further refined and confirmed prior to Project construction, during the detailed design phase. Property requirements for the preferred design for the GO Station improvements are discussed further in Section 4 of this EPR, and provided in the Socio-Economic and Land Use Characteristics Report which is located within Appendix F of this EPR.

2.3 Bradford Layover Facility

To accommodate future RER services on the Barrie rail corridor, a new layover facility for the overnight storage of trains is required between Mile 38.65 (northwest of Bradford Street in the Town of East Gwillimbury) and Mile 47.67 (directly south of the Town of Bradford West Gwillimbury/Town of Innisfil municipal boundary). This facility is a one of the three key components of the BRCE Project.

The utilization of a layover facility to store, service (including fueling), inspect and maintain trains when they are not in service is integral to the implementation of GO Expansion services on the Barrie rail corridor. The overnight work that is typically performed on the train sets consists of replenishment of locomotive fuel, cleaning of passenger car interiors and restrooms as well as minor repairs such as replacement of lights, interior car lights, brake shoes, air hoses, and electrical and communications lines. A layover facility is critical to operations as it provides a location to stage trains during off-peak periods, thereby keeping unused trains off active tracks to minimize congestion at stations.

2.3.1 *Site Selection Process and Location*

Fundamentally, the site has to be of a sufficient size to accommodate all of the facility components required for operation. In addition, the site has to be adjacent to the Barrie rail corridor to minimize property and easement requirements. Thus, a six-step site selection process (or methodology) was designed and followed to select and evaluate prospective sites for the future layover facility. As one moves through the steps of the process, the level of detail increases as the analyses become more rigorous. Specifically, more detailed selection criteria are added to enable differentiation between the prospective sites. The site selection process involved the systematic elimination of less suitable sites in favour of more suitable sites, considering all aspects of the environment (e.g., natural, social, economic, cultural, and technical).

An initial long list of 11 potential sites (or locations) which met the minimum size and proximity to the Barrie rail corridor requirements were assessed (comparatively evaluated) based upon their capital cost, site layout, proximity to the Bradford GO Station, current on-site structures, number of individual properties affected, current and future (planned) land uses adjacent to each site, designated areas identified for protection, and effects on wildlife and their habitat. Following the comparative evaluation, five sites were eliminated (screened out) from further evaluation as they were not deemed suitable locations for development of the future Bradford Layover Facility.

The remaining six short-listed sites were assessed using a more robust set of evaluation criteria including compatibility with adjacent land uses, effect on agricultural resources, existing on-site building/structures, availability of utilities, and effects on the natural environment, cultural heritage and archaeological resources. Based on this subsequent comparative evaluation, three additional sites were eliminated, and the three remaining, or Recommended sites were carried forward for further detailed evaluation in the next step.

The three Recommended Sites carried forward for further comparative analysis were: the Industrial Northwest Site, located at the northwest quadrant of the Industrial Road crossing at Mile 42.26; the Line 10 Northwest Site, located at the northwest quadrant of the Line 10 crossing at Mile 44.34; and the Line 13 Northwest Site, located at the northwest quadrant of the Line 13 crossing at Mile 47.21.

Based on the results of the comparative evaluation process, all of the three Recommended Sites have limitations in terms of the evaluation criteria established for the following five key categories:

- Category A - Natural Environment;
- Category B - Socio-Economic Environment;
- Category C - Cultural Environment;
- Category D - Built and Technical Environment; and
- Category E - Costs.

However, based on the comparative evaluation of the three Recommended Sites, the Industrial Northwest Site was identified as the preferred site for the future layover facility. The Industrial Northwest Site best addresses Metrolinx's needs and can be constructed and operated in a cost-effective manner, while minimizing potential effects to the environment.

Due to its location within an existing and active Industrial Park, the Industrial Northwest Site provides the greatest advantages of the three Recommended Sites. Development of the layover facility at the Industrial Northwest Site complies, and is in keeping, with the Town's Official Plan (OP). As such, development of the layover facility within the Artesian Industrial Park is consistent with the Town's industrial vision for this area. Based on an assessment of the potential (or anticipated) effects of the three Recommended Sites, the analysis indicated that the Industrial Northwest Site would result in the least potential impact to the environment and the surrounding community.

During consultation with municipalities, the Town of Bradford West Gwillimbury (Town) provided additional feedback to Metrolinx on the proposed layover facility located on Artesian Industrial Parkway. The Town requested Metrolinx to consider an alternative site located on the east side of the Barrie rail corridor at the Line 9 level crossing. Figure 2-13 shows the location of the Line 9 Site in relation to the Industrial Northwest Site. Metrolinx is presently assessing the alternative Line 9 Site to confirm the its technical (engineering) and environmental feasibility of housing the proposed layover facility. If determined to be feasible, further review, consideration and discussions with the Town, the Ministry of Natural Resources and Forestry (MNRF), LSRCA and other stakeholders will occur during the next phases of the Project.

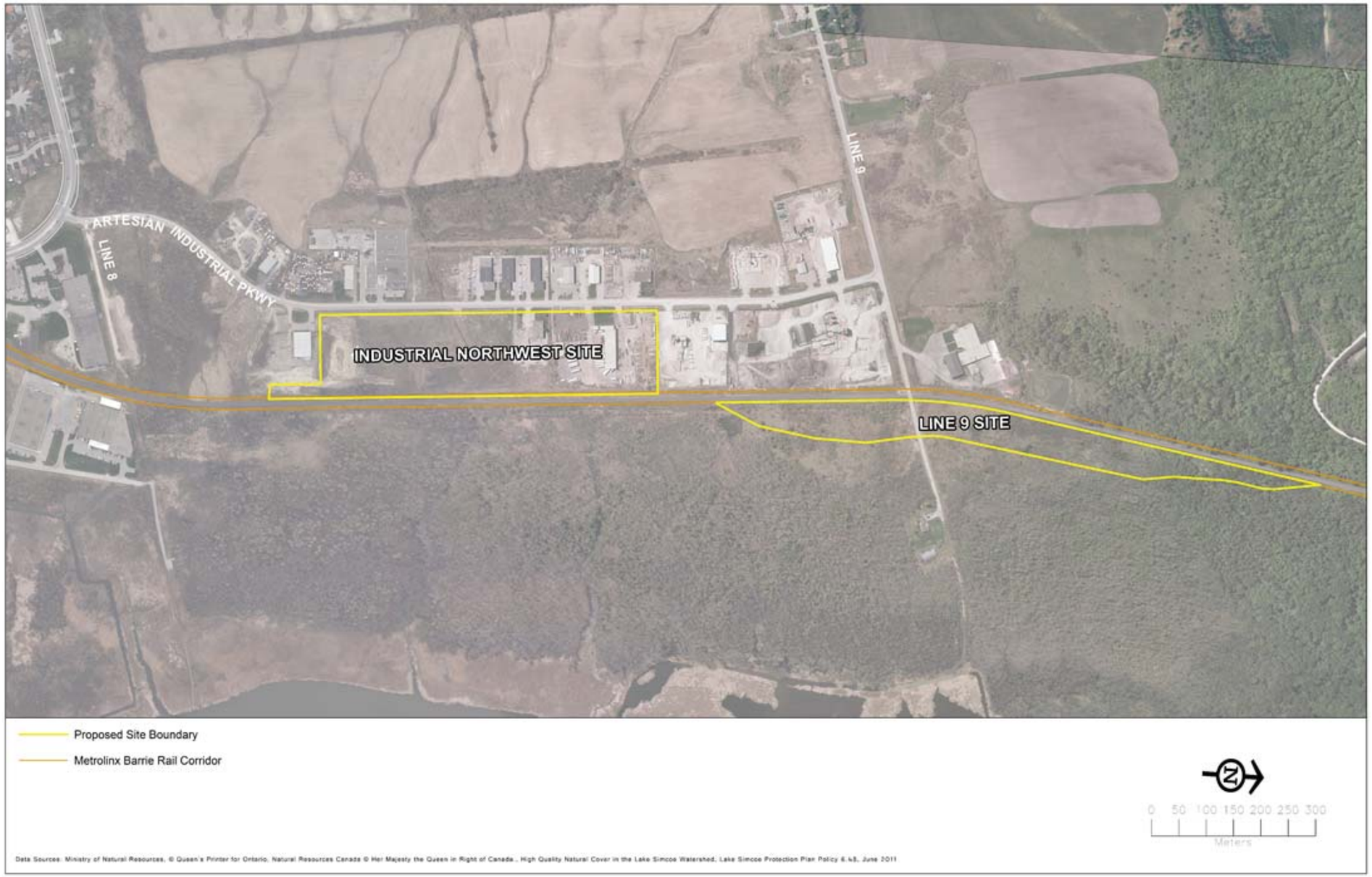

Figure 2-13: Alternative Layover Site Locations within the Town of Bradford West Gwillimbury

2.3.2 *Preferred Layover Design and Facility Elements*

Figure 2-13 illustrates the two alternative layover facility site locations and their proposed site boundaries. In summary, the two sites are large enough to:

- Provide train storage for six, 12-car consists (2 locomotives and 12 coaches);
- House the proposed ancillary buildings and storage areas (e.g., staff and train crew facility, staff parking lot, train servicing vehicle storage, and electrical building and associated wayside power control systems); and
- Accommodate vehicle access, vehicle circulation, staff parking, and maintenance activities.

The following are the minimum requirements considered for the layover facility:

- Train storage for six, 12-car consists (2 locomotives and 12 coaches);
- Future permanent crossover between main tracks, however an interim turnout is acceptable;
- All turnouts are to have Snow Clearing Devices;
- Track spacing to allow for train servicing (minimum 24ft & 30ft alternating track centres with paved walkways or roadways between trains;
- Provisions for an Overhead Catenary System (OCS) and all related supporting infrastructure required for electrification;
- Wayside power for all six consists;
- Wayside power energy management system;
- Sand storage silo and dispensing to support mobile locomotive sanding;
- Compressors and a ground air system for all six consists;
- Paved roadways to accommodate access for Direct Truck to Locomotive fueling for diesel locomotives;
- Applicable environmental protection measures;
- Staff and train crew facility;
- Staff parking;
- Train toilet servicing building and related infrastructure;
- Train servicing vehicle storage, which can be combined with the toilet servicing building;
- Electrical building and associated wayside power control systems;
- High mast lighting;
- Closed-circuit TV (CCTV);
- Provisions for all related Electrification Infrastructure including maintenance building and equipment storage and staging (corridor electrification maintenance);
- Switch heaters;
- Site/yard fire protection system;
- High security (Clear-Vu) perimeter fencing; and
- High speed bi-folding gate for the vehicle entrance, and turnstile for staff and train crews. Both gate and turnstile will require security access control, remote monitoring and operation, and CCTV coverage.
- Based on the above minimum requirements, it was determined that development of the new layover facility will require a minimum site size of 6.0 ha. This site size would provide adequate lands to:
- House the proposed buildings and storage areas; and
- Accommodate vehicle access, vehicle circulation, staff parking, and maintenance activities.

Though a minimum site size of 6.0 ha was deemed appropriate to accommodate the proposed layover facility and all ancillary infrastructure, it is recognized that this site size is not large enough to allocate much space for the buffering of site operations from neighbouring land uses. For example, buffering of on-site noise producing sources from the property line of sensitive land uses which include, but are not limited to residences, day care centres, and educational and health facilities. As such, the need to acquire additional surrounding property to effectively buffer or separate site operations from any neighbouring sensitive land uses will be investigated during the detailed design phase.

2.3.3 *Property Acquisition*

Property required to accommodate the proposed layover facility will be further refined and confirmed prior to Project construction. Property required to accommodate the preferred design for the layover facility are discussed further in Section 4 of this EPR, and provided in the Socio-Economic and Land Use Characteristics Report, which is located within Appendix F of this EPR.

2.4 Construction Phasing

A proposed (or preliminary) construction schedule for Phase One of the BRCE Project is shown in Table 2-18. As noted therein, detailed design of all aforementioned Phase One Project components will be completed in 2017, and early station construction works initiated. Construction of the overall Project is proposed to occur from 2017 to 2023, with construction of the second track expected to be completed by the first quarter of 2023. Future Phase(s) of the Project will be scheduled based upon ridership demand and the availability of funding.

Table 2-18: Preliminary Construction Schedule

Year	Activity
2017	• Detailed design completion • Environmental assessment approval • Procurement of applicable environmental permits and approvals • Appointing of Contractors • Property acquisition commencement • Early station construction works
2018	• Property agreements resolved • Mobilization • Site preparation and surveys • Environmental protection • Clearing and grubbing • Utility locates
2018-2022	• Utility relocations • Construction of retaining walls and associated grading • Grading and trackbed construction • Construction of drainage works • Construction and expansion of bridges and structures • Station construction • Fence construction • Landscaping • Corridor commissioning
2023	• Construction completion

The above schedule will change according to the detailed design, and will depend on a number of outside factors such as the timely purchase (acquisition) of the required property, successful procurement of applicable environmental permits and approvals, coordination of track works with bridge/culvert and station construction, and weather conditions. It is noted that many construction activities depend on the completion of other portions or components of the Project as discussed below.

This schedule will also change as Metrolinx continues to expand service in the interim. The second track construction will consider existing service (at the time of construction) as well as planned service upgrades for the duration of the construction period.

2.4.1 Construction Staging

In most aspects, the staging of construction activities must consider operations which must be performed before another is started. The property acquisition process takes approximately 18 months and must be resolved prior to mobilization and construction start of Project components outside the existing Metrolinx ROW. Other construction works such as bridges and stations can be started early on in the construction process, but actual start dates will vary by location and must be halted until other Project works have been completed.

2.4.1.1 Construction Relating to Drainage, Grading, Track and Retaining Walls

It is anticipated that the grading, drainage and retaining wall works will all be completed in parallel with each other, in a segmented approach along the Barrie rail corridor. The guiding principles in designing the grading works are to avoid the taking of any privately held properties to the extent practical, and to utilize construction techniques that minimize potential effects to adjacent private residences as best possible. However, there are some properties that will have to be purchased in order to accommodate the new track. Other properties may be purchased should willing sellers come forward and the purchase of their property facilitates the construction of the second track allowing fill track bed embankments to be constructed.

Subject to detailed engineering, it is planned to use earth from cut sections to construct fill sections, thus keeping as much earth material on Metrolinx property as possible. Any excess soils will be transported and disposed off-site at a licensed facility. The construction of the actual track structure will commence after the fill aspect of grading.

To avoid taking excess property in some residential areas or where buildings would be otherwise affected, retaining walls have been proposed along certain sections of the Barrie rail corridor. The cut or fill sections associated with the retaining walls will require excavated material to be transported from other areas within the corridor. Due to the many operations involved, and considering that retaining wall construction will be completed simultaneously with grading and track works, these activities will most likely occur throughout the entire construction period.

2.4.1.2 Bridge Construction and Widening

A new bridge will be constructed at Rutherford Road, and bridge widening will take place at several bridges and smaller structures in order to accommodate the second track as well as a potential future third track. Any roadwork associated with the new structures as well as the work associated with the track expansion will affect the traffic in those areas. Work will consist of demolition, forming and placing reinforced concrete, steel erection and site restoration. Any wastes generated will be recycled where possible or disposed of in appropriate (licensed) facilities. Timing of this work will be established in conjunction with staff from the affected municipalities and dictated by traffic requirements. The bridge construction will most likely occur throughout the majority of the Project construction period.

2.4.1.3 Station Work

Station work will involve upgrades to the Rutherford, King City, East Gwillimbury, Maple and Aurora GO Stations, and the construction of the new Caledonia and Downsview Park GO Stations. The work will consist of demolition, concrete work, fencing, elevator and shelter installation and paving. The early station construction works such as under-track tunnels are to start in 2017. Remaining station work is proposed to take place between 2018 and 2023, in coordination with other aspects of overall Project construction.

2.4.2 Consideration for Detailed Design

In 2017, Metrolinx plans to increase service on the Barrie rail corridor to two-way, all-day service. As such, the typical 8-10 hour weekday work blocks will likely not be possible due to the frequency of passing trains. Accordingly, night work will be restricted to 5-6 hour work blocks on weekdays and weekends, which will have to be coordinated with CNR freight operations. The construction timeline will depend on these corridor access restraints which will need to be confirmed prior to Project construction.

The Barrie rail corridor has existing infrastructure that is largely bounded on both sides by commercial, industrial and residential land uses, but in order to construct the Project, materials need to be delivered to the vicinity of the work. Obtaining suitable land that can be used for construction staging and laydown areas within the urbanized areas along the Barrie rail corridor will need to be confirmed and coordinated with the affected municipality and property owner prior to Project construction.

Work is required to be completed in environmentally sensitive areas or within proximity to environmentally sensitive features, including but not limited to:

- Watercourses and Wellhead Protection Areas (WHPAs);
- Provincially Significant Wetlands (PSWs) and Areas of Natural and Scientific Interest (ANSIs);
- Conservation Areas;
- Key Natural Heritage Features (KNHFs) and Key Hydrologic Features (KHFs); and
- Ecologically Significant Forests.

Work must be conducted around time sensitive seasons including aquatic spawning season, bird nesting, hibernating and migratory times and other natural considerations, which can all affect construction timelines. As there are a large number of trees along the corridor limits, tree protection procedures will require consideration. Weather will also have a large impact on the schedule, including rain days and seasonal changes. Winter will not only impact the schedule but will also have direct effect on the price of the construction effort. All of these environmental factors will need to be considered when refining the Project construction schedule during the detailed design phase and prior to actual Project construction. Further details are outlined in Table 4.3 in Section 4.3.1.2 of this EPR.

3. Existing Conditions

This section of the EPR provides a summary of the existing (or baseline) environmental conditions categorized by BRCE Project component, namely; Rail Infrastructure, GO Station Improvements, and the Bradford Layover Facility. The baseline conditions are broken out into the natural, cultural, and social and built environments to summarize the features within the study area. 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, while the social and built environment includes air quality, noise and vibration, traffic and transportation infrastructure, and utilities and municipal infrastructure.

This 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 property. The information presented in this section of the EPR has been informed by the studies completed for the Assessment, which are documented in the following TPAP Reports:

- Natural Environment Report as provided in Appendix A;
- Tree Inventory Plan and Arborist Report as provided in Appendix B;
- Stage 1 Archaeological Assessment as provided in Appendix C
- Cultural Heritage Screening Report as provided in Appendix D;
- Cultural Heritage Evaluation Reports, Statements of Cultural Heritage Value and Heritage Impact Assessment as provided in Appendix E;
- Socio-Economic and Land Use Characteristics Report as provided in Appendix F;
- Air Quality Study as provided in Appendix G;
- Noise and Vibration Impact Assessment as provided in Appendix H; and
- Traffic Impact Analysis as provided in Appendix I.

3.1 Rail Infrastructure (Existing Track)

This section describes the existing conditions and features within the existing rail track study area.

3.1.1 Physical Environment

3.1.1.1 Landform and Physiography

Significant landforms and physiographic regions are presented in Figure 3-1. The Iroquois Plain is the lowland region bordering Lake Ontario. This region is characteristically flat and formed by lacustrine deposits laid down by the inundation of Lake Iroquois, the body of water that existed during the late Pleistocene Era. The City of Toronto is located within this region, which spans a distance of 300 km from the Niagara Escarpment to the Trent River. The old shorelines of Lake Iroquois include cliffs, bars, beaches, and boulder pavements.

The South Slope is found along the southern slope of the Oak Ridges Moraine (ORM) with an average width of 9 to 11 km and, as with the Iroquois Plain, reaches from the Niagara Escarpment to the Trent River. This area is often intertwined with the Iroquois and Peel Plains. The South Slope contains a variety of soils, but is often considered to be excellent for agricultural uses.

The Peel Plain is approximately 775 km^2 in size and lies between Halton and York Region. The plain is considered level to gently undulating, with clay soils. The area slopes gently toward Lake Ontario and is fairly uniform with the exception of the deep cut valleys created by Bronte, Oakville, and Etobicoke Creeks and the Credit, Humber, Don, and Rouge River systems.

The ORM extends from the Niagara Escarpment to the Trent River, forming the height of land dividing the streams of the Lake Ontario drainage basins from those flowing into Georgian Bay and the Trent River. This landform feature is considered to be the source area for many streams which drain the till plains on either side of it. The hills of the ORM are predominately composed of sandy or gravelly materials. The northern border of the morainic area is deeply indented by swamp-floored valleys, along which many outwash terraces are found.

The Schomberg Clay Plains, along the northern slopes of the ORM, contain deep deposits of stratified clay and silt. The surface under the clay in the area of the Town of Newmarket is comprised of a drumlinized till plain. The smaller drumlins are completely covered, but many of the larger ones escaped complete burial although the clay may occur well up the slopes of the hills. In the area along the Holland River, between the Town of Newmarket and Holland Landing, considerable dissection has taken place, giving rise to rugged topography.

The Simcoe Lowlands is a physiographic region that covers an area of about 2,850 km$^{2.}$ The lowlands that drain to Lake Simcoe lay between 218 metres and 259 metres Above Sea Level (a.s.l.). These lands were historically flooded by Lake Algonquin and are bordered by shorecliffs, beaches, and 70xistin terraces. They are underlain by sand, silt, and clay.

The western portion of the Peterborough Drumlin Field contains till that is somewhat sandier than the eastern part of the region. The drumlin field is notable for its eskers as well as drumlins. In the area near the Town of Bradford, deposits of clay lie between the drumlins. This “drumlin and clay flat” was formed in areas across the physiographic region that was historically flooded by ancient lakes. South of Lake Simcoe, drumlins and drumlin uplands rise from sand plains. In the flooded areas, many drumlins have been wave-washed sufficiently to leave an existing surface, while in some cases the hillsides have been undercut and over steepened.

There are also eight types of physiographic landforms that are located throughout the study area. These include: Bevelled Till Plains, Sand Plains, Till Plains-Drumlinized, Kame Moraines, Till Moraines, Clay Plains, Peat and Muck, as well as beaches and shore cliff structures (Chapman and Putnam, 1984).

3.1.1.2 *Soil and Bedrock Geology*

Similar to its physiography, the quaternary geology of the study area is also variable throughout the existing Barrie rail corridor. The soil conditions of these various geologic features are summarized in Table 3-1.

Table 3-1: Quaternary Geology of the Study Area (Ontario Geological Survey Map 2566)

Location Along the Barrie Rail Corridor	Quaternary Geology	Soil Conditions
Southern extent of study area to York, Holland Landing to Gilford, and Barrie	Coarse-textured glaciolacustrine deposits	Sand, gravel, minor silt and clay; Foreshore and basinal deposits.
York to King City	Till	Stone-poor, sandy silt to silty sand-textured till on Paleozoic terrain.
Eastern portion of King City	Modern alluvial deposits	Clay, silt, sand, gravel, may contain organic remains.
East of King City; intermittently north of Lefroy to east side of Barrie	Till	Clay to silt-textured till (derived from glaciolacustrine deposits or shale).
Aurora and Newmarket	Fine-textured glaciolacustrine deposits	Silt and clay, minor sand and gravel. Interbedded silt and clay and gritty, pebbly flow till and rainout deposits.
South of Lefroy	Glaciofluvial deposits	River deposits and delta topset facies.
Southeast of Barrie	Ice-contact stratified deposits	Gravel and sand, minor till; includes esker, kame, end moraine, ice-marginal delta and subaqueous fan deposits.
Intermittently from north of Lefroy to southeast of Barrie	Older alluvial and glaciolacustrine deposits	Clay, silt, sand, gravel, and may contain organic remains.

The Paleozoic Geology of Southern Ontario (Map 2254) was reviewed to characterize the bedrock within the study area. The bedrock encompassing the study area includes four distinct geologic Formations. The Georgian Bay Formation is the southernmost unit and encompasses the section of the existing Barrie rail corridor that extends from the City of Toronto, north to the Hamlet of Hope. This Formation is characterized by grey shale, with interbedded limestone and siltstone, and gradually overlies the Whitby Formation.

The Whitby Formation is located north of the Georgian Bay Formation and is also characterized primarily by grey shale, with minor limestone. The Whitby Formation gradually overlies the Lindsay Formation, which is part of the Simcoe Group and is characterized by limestone with interbeds of shale. The northernmost geologic unit within the study area is the Verulam Formation (also part of the Simcoe Group). Similar to the Lindsay Formation, the Verulam Formation is also primarily comprised of limestone, with interbeds of shale.

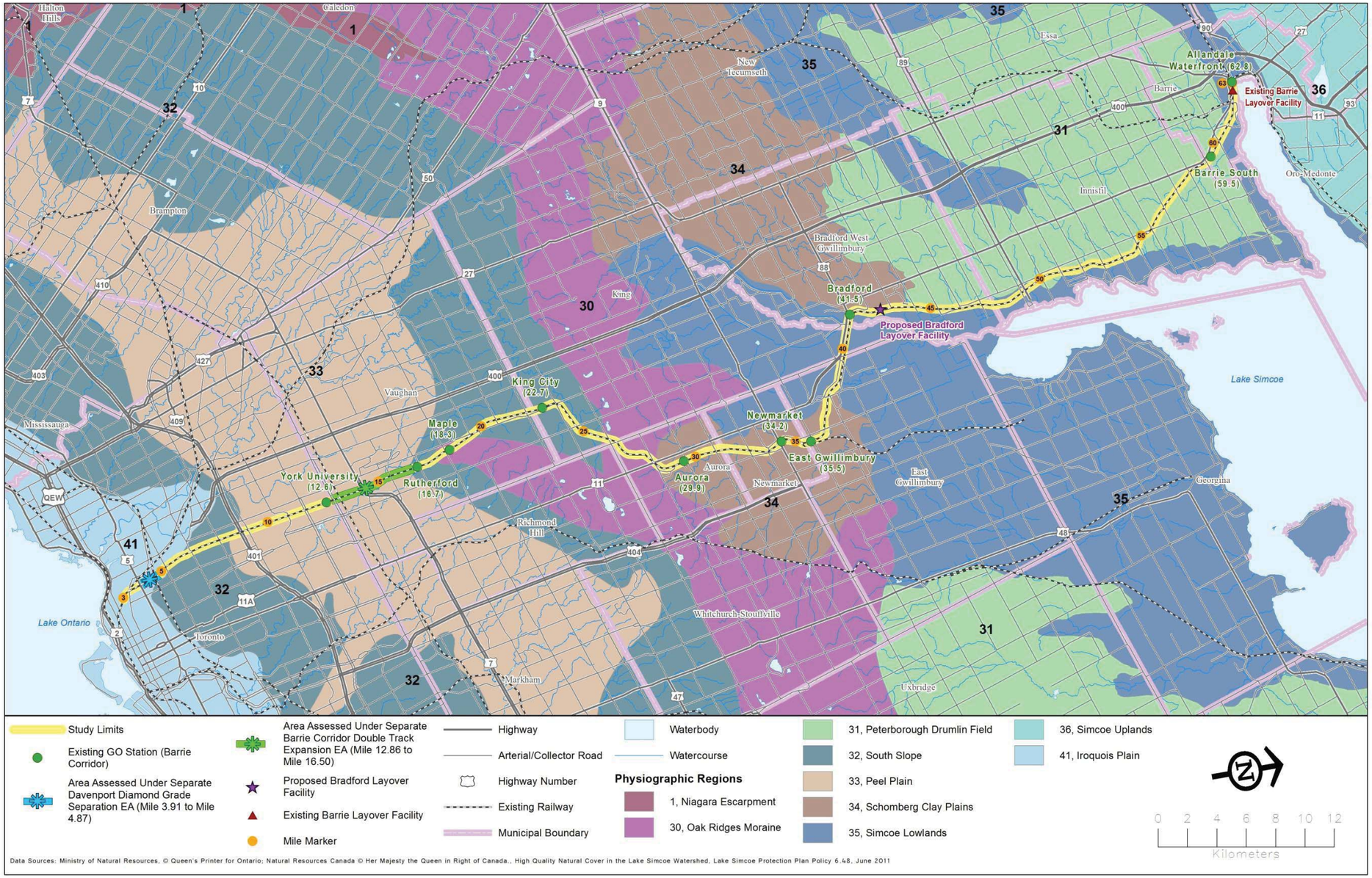

Figure 3-1: Physiographic Regions

3.1.1.3 *Groundwater*

Source Water Protection Plans and Assessment were reviewed to characterize the groundwater regime across the study area. The Approved Source Water Protection Plan for the Credit Valley, Toronto and Region and Central Lake Ontario (CTC) Source Water Protection Area (CTC Source Water Protection Plan, 2015) provided relevant information for the study area within the TRCA's jurisdiction, while Part 1 (Lake Simcoe Watershed) of the January, 2015 Approved Assessment Report: Lake Simcoe and Couchiching – Black River Source Protection Area (South Georgian Bay Lake Simcoe Source Protection Region, 2015), provided relevant information for the study area within the LSRCA's jurisdiction.

The aforementioned CTC Source Water Protection Plan describes the Toronto Region Source Protection Area (TRSPA) as containing two municipal wells (Well 3 and Well 4) within the Township of King, whose WHPA is located within proximity to the existing Barrie rail corridor. The municipal wells are located approximately 35 metres apart (Well 3 and Well 4), and are approximately one km west of the nearest segment of the existing Barrie rail corridor. According to the CTC Source Water Protection Plan (2015) Map 2.19, the study area is outside of the WHPA-C zone (e.g., representing the five-year time of travel for groundwater flow to the well), which also represents the limit to the area where Dense Non-Aqueous Phase Liquids (DNAPLs) are considered a threat under source protection. As such, the upgrades to the existing Barrie rail corridor are not anticipated to affect groundwater quality in the Well 3 and Well 4 capture zones. No other municipal supply well capture zones in the TRSPA were identified as being located within proximity of the BRCE Project study area.

Map 3.4 of the above mentioned report identifies a very large zone across the TRSPA, and the Lake Simcoe and Couchiching – Black River Source Protection Area (encompasses the majority of the study area), as an area that is a Future Significant Groundwater Quantity Threat Area. This large zone is classified as a WHPA-Q1, which refers to the area where activities which take water without returning it to the same source would be considered to be water quantity threats to municipal supplies. This area is described as being at a Moderate Risk Level for water quantity; including water taking and recharge reduction. However, based on the nature of the proposed works, this is not likely considered to be an issue, and no effects are anticipated. Examples of such water taking activities include municipal and private wells, as well as industrial uses, such as agriculture irrigation and aggregate extraction below the water table which requires pumping operations. Recharge reduction refers to the potential impairment of the long-term viability of a water system. Typical activities of recharge reduction include existing and planned land use developments (e.g., residential subdivisions, undifferentiated suburban lands, and employment areas). Conversions of land to impervious surfaces, such as paved parking lots and roads, also restrict aquifer recharge (CTC Source Water Protection Plan, 2015).

Part 1 of the January, 2015 Approved Assessment Report for the Lake Simcoe and Couchiching – Black River Source Protection Area (South Georgian Bay Lake Simcoe Source Protection Region, 2015) was reviewed for lands within the LSRCA watershed. In general, much of the BRCE Project study area within this watershed crosses lands that primarily require groundwater to service both private and municipal supplies.

It is also noted that York Region is in the process of bringing a new municipal supply well online in the near future in the Green Lane/Second Concession area in the Town of East Gwillimbury. This will introduce a new WHPA in the vicinity of the Green Lane GO Station and the Barrie rail corridor. The delineation of the WHPA and associated vulnerability scoring has not been completed yet, however, the vulnerable areas may extend to the rail corridor.

Table 3-2 characterizes the aquifer vulnerability associated with municipal supply wells whose respective WHPAs are located within proximity to the existing Barrie rail corridor. As noted therein, the overall vulnerability of most municipal supply wells is considered to be low. Town of Aurora Wells PW1-PW4, PW5, City of Barrie Well 12 and the Town of Bradford West Gwillimbury Church Wells 1 and 2 (which are physically located within the Township of King, in York Region, to the east of the community of Bradford) are considered to be moderately vulnerable. In addition, the Barrie rail corridor is in close proximity (35 metres) to the Church Wells 1 and 2, and is considered to be within a highly vulnerable area (Vulnerability score of 10).

Table 3-2: Characterization of Aquifer Vulnerability

Location	Well I.D.	Well Distance to Existing Rail ROW	WHPA Zones crossed by Rail ROW	Aquifer Vulnerability Score		
				Pathogens	Chemicals	DNAPLs
Aurora	PW1-PW4	730 m	C-D	N/A	6	Yes
Aurora	PW5	460 m	B-D	6	6	Yes
Newmarket	PW13, PW16	970 m	C-D	N/A	N/A	Yes
Newmarket	PW1, PW2	1.8 km	D	N/A	N/A	N/A
Newmarket	PW15	1.75 km	D	N/A	N/A	N/A
Holland Landing	Well 1	600 m	C-D	N/A	N/A	Yes
Bradford West Gwillimbury	Church Well 1,Well 2	35 m	A-D	10	10	Yes
Stroud	Wells 1, 2, 3	420 m	D	N/A	N/A	Yes
Barrie	Well 12	375 m	B-D	6	6	Yes

Notes:

N/A means not available

WHPA – A zone refers to location within 100 metres of subject well. Immediately vulnerable to activities involving pathogens, chemicals, and DNAPLs;
WHPA – B zone refers to two-year time of travel. Vulnerable to activities involving pathogens, chemicals, and DNAPLs;
WHPA – C zone refers to five-year time of travel, with the exception of Bradford West Gwillimbury, where it refers to 10-year time of travel. Vulnerable to activities Involving DNAPLs;
WHPA – D zone refers to 25-year time of travel. Vulnerability is considered low to all three potential threats;
Vulnerability scores range from 2 (low) to 10 (high); and Vulnerability is not considered for DNAPL threats.

3.1.2 Aquatic Environment

3.1.2.1 Watersheds and Subwatersheds

The study area spans across the regulated area of both the TRCA in the south and LSRCA in the north, and crosses eight major watersheds or subwatersheds as listed in Table 3-3. 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 from south to north, into Lake Simcoe. The various watersheds and subwatersheds which cross the Barrie rail corridor are illustrated in Figure 3-2. The corresponding watercourses which are crossed by the existing Barrie rail corridor are described in the Natural Environment Report (NER) provided in Appendix A of this EPR. The major watercourses crossing the existing Barrie rail corridor from the south to north are summarized in Table 3-4. However, there are several smaller watercourses which flow into these larger watercourses within each jurisdiction. In total, 46 watercourses were studied as part of this Assessment. A list of these watercourses is found in the NER provided in Appendix A of this EPR.

Table 3-3: Major Subwatersheds in the Study Area

Major Watershed or Subwatershed	Applicable Conservation Authority
Upper West Don River	TRCA
East Humber River	TRCA
East Holland River	LSRCA
West Holland River	LSRCA
Innisfil Creeks	LSRCA
Hewitt's Creek	LSRCA
Lovers Creek	LSRCA
Barrie Creeks	LSRCA

3.1.2.2 Aquatic and Fish Habitat

The aquatic environment associated with the study area is comprised of many types of watercourses, and a limited number of small waterbodies. Watercourses range from seasonal and intermittent drainage features to large rivers. Waterbodies identified along the existing ROW were primarily wetlands and stormwater-related features, with some connectivity to adjacent watercourses. No lakes were observed along the Barrie rail corridor. A total of 46 drainage and watercourse crossings were identified based on the limits of the study area.

Of these 46 crossings, 14 major watercourses were identified as traversing the rail ROW within the study area, some at several locations. These watercourses are within either the TRCA or LSRCA jurisdictions, both of which are responsible for the management of their respective watersheds. Table 3-4 outlines the major watercourse crossings.

The 14 major watercourses that traverse the rail ROW either support, or have the potential to support a fishery as described in the *Fisheries Act*. Many of the minor watercourses crossed (that are not mentioned in Table 3-4), also either directly or in-directly support fish that are part of a fishery. These minor watercourses are described further in the NER. A high-rail tour of the Barrie rail corridor was completed by Burnside staff between June 1 and June 5, 2015, with the aim of verifying and adding to the background information, and confirming the presence of potential fish habitat within the study area. The following sections provide a description of the watercourse crossings and site reconnaissance findings based on these activities.

The reaches of these watercourses vary in their degree of human influence, ranging from relatively undisturbed conditions with adjacent valley forest cover to open, channelized reaches with very little associated natural vegetation and mostly human land uses. The flow regimes of the major watercourse crossings, and the majority of the relatively minor watercourse crossings, appear permanent in nature.

It is noted that some of the minor watercourse crossings, as observed during the site investigations, exhibit flow regimes that can be described as unstable, with stream levels greatly fluctuating after rainfall and storm events. Minor ephemeral and Headwater Drainage Features (HDFs) that did not appear to provide habitat to fish at any time throughout the year were not assessed as part of this study. These drainage features are typically represented by meadow and agricultural swales, drainage ditches, and topographic lows.

Table 3-4: Major Watercourse Crossings in the Study Area

Major Watercourses	Applicable Conservation Authority	Mileage of Crossing on Barrie Rail Corridor
West Don River	TRCA	15.40
Westminster Creek	TRCA	16.70
East Humber River	TRCA	24.80
Tannery Creek	LSRCA	28.80, 31.50 and 32.00
East Holland River	LSRCA	33.70
West Holland River	LSRCA	41.00
Scanlon Creek	LSRCA	44.15
White Birch Creek	LSRCA	49.20 and 49.25
Wilson Creek	LSRCA	50.12, 50.36, 50.86
Carson Creek	LSRCA	52.12
Belle Aire Creek	LSRCA	53.28
Hewitt's Creek	LSRCA	57.41, 58.33
Lovers Creek	LSRCA	61.20
Whiskey Creek	LSRCA	62.00

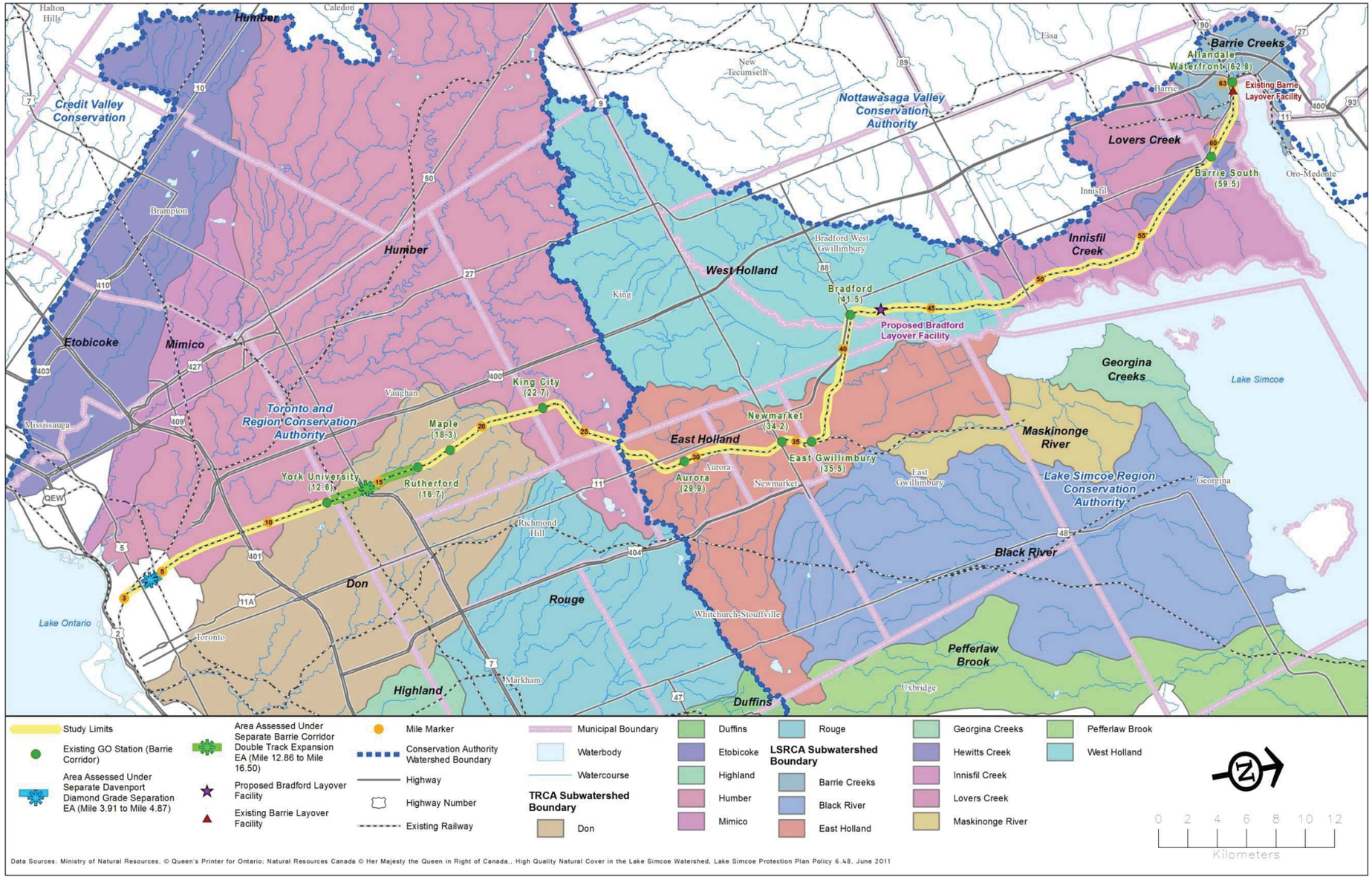

Figure 3-2: Watersheds and Subwatersheds

West Don River – Mile 15.40

The main stem and several tributary branches of the West Don River are crossed by the existing rail ROW at several locations north of Highway 407, in the City of Vaughan. Encompassing 358 km^2 in total, the Don River watershed is one of the largest in the TRCA's jurisdiction. The only watercourses that the existing Barrie rail corridor traverses within the Don River Watershed are located entirely within the Upper West Don River subwatershed. This subwatershed contains half of the watershed's higher quality terrestrial habitat and some of the best opportunities to add natural cover (Don River Watershed Plan, 2009). There are also several flood-vulnerable areas within the subwatershed in the general region of the crossing.

The rail crossing of the West Don River at Mile 15.40 was recently replaced by a concrete bridge as part of the double tracking work under construction between Mile 12.86 and 16.50 which was assessed under a separate TPAP. At the time of the site reconnaissance the steep banks were free of established vegetation as construction involving land-clearing, was ongoing both north and south of the crossing. The river flows west to east, beneath the bridge in an almost uniform flat morphology. Upstream adjacent to the bridge, the relatively wide channel (approximately 4.5 metres) meanders south, parallel to the existing rail ROW prior to flowing beneath the bridge. Downstream, the channel was characterized as being relatively straight. Established riparian vegetation was observed both upstream and downstream of the bridge within and beyond the rail corridor, providing some overhead cover. Large downed wood debris was also noted, along with a predominantly sand substrate. Although no fish were observed during the site reconnaissance, the watercourse provides direct fish habitat and is characterized as a permanent warm water watercourse.

Westminster Creek – Mile 16.70

Westminster Creek is also part of the Upper West Don River subwatershed and drains into the West Don River. It generally flows from north to south and is crossed by the existing rail ROW, adjacent to the Rutherford GO Station, south of Rutherford Road. Westminster Creek is identified as consisting of some flood vulnerable areas, as the Upper West Don River subwatershed lacks stormwater management (Don River Watershed Plan, 2009).

The watercourse in the area of the crossing is the headwaters, and is characterized as a ponded area of a wetland that is very slow-moving. The channel is relatively undefined, and is not considered to be direct fish habitat, but contributes water quality and quantity to direct fish habitat downstream.

The substrate in the area of the existing rail ROW was identified as detritus and muck, and the wetland/watercourse contained cattails and Common Reed (*Phragmites australis ssp. australis*). The wetland appeared to receive the majority of its upstream water from drainage ditches. This watercourse is characterized as a permanent, warm water watercourse.

East Humber River – Mile 24.80

The Humber River watershed is the largest in the TRCA's jurisdiction and encompasses 908 km^2. The watershed flows through a number of significant physiographic areas. More specifically, it flows through the South Slope and Peel Plain within the study area. The Humber River watershed spans four regional municipalities or counties and ten local municipalities.

Due to its rich history, the Humber River was designated a Canadian Heritage River in 1999, and is the only river to receive this designation in the Greater Toronto Area (GTA). The Canadian Heritage Rivers System (CHRS) is Canada's national river conservation program, and is aimed to promote, protect, and enhance Canada's river heritage. No new legislation is created when a river is designated a Canadian Heritage River, and all protective actions depend on existing laws and regulations, and respect the rights of Aboriginal peoples, communities, private landowners, and other stakeholders (Canadian Heritage Rivers System, 2011).

Geological processes such as glaciations; erosion, flooding, and deposition have also contributed to the natural heritage value of the Humber River watershed. The Humber watershed contains an extensive greenspace system through the GTA and the Main and East branches are popular locations for angling.

The East Humber River and its tributaries are crossed at several locations along the existing Barrie rail corridor. Existing conditions within and adjacent to the rail corridor were observed by Burnside staff during the June, 2015 high-rail tour from the crossing. Background information in the area of the Mile 24.80 crossing indicated the potential presence of Redside Dace (*Clinostomus elogatus*) Habitat. Redside Dace is listed as a Species at Risk (SAR) fish and is classified as an Endangered species under Ontario's *Endangered Species Act* (ESA, 2007).

The East Humber River at this location consists of an upstream flat morphology, flowing west into a relatively large pool (approximately 20 metres by 20 metres), adjacent to the downstream section of the existing rail ROW. The water then continues to flow west through a meandering run section, that lies within a meadow valley. The substrate within the watercourse was observed to be comprised predominantly of sand, along with some silt and cobble-sized stone. No major erosion was observed near the rail crossing, though approximately 40 metres downstream, outside of the existing rail ROW; some of the banks along the meanders were undercut. A relatively immature riparian cover existed on the downstream side of the watercourse, though the upstream section contained mature apple trees and shrubs. No major erosion was observed around the existing bridge piers.

Although no fish were observed during the site investigations, it is very likely that fish inhabit this stretch of the watercourse. Based on background information, this watercourse is identified as a permanent, warm water watercourse and likely provides direct fish habitat for fish that prefer cool to warm water thermal regimes. The background information also identified this section of the East Humber River as potentially containing habitat used by Redside Dace. However, based on the site investigations, the areas immediately adjacent to the rail ROW did not appear to be ideal habitat for Redside Dace, as this species tends to prefer slow-moving, cool streams that feature successions of riffles and pool sequences that are bound by copious, low overhanging riparian vegetation. This type of habitat was not present.

Tannery Creek – Mile 28.80, 31.50, and 32.00

Tannery Creek is located within the East Holland River subwatershed and outlets to Lake Simcoe. Three major branches of the creek are crossed by the existing rail ROW, near the Town of Aurora. The watercourse at crossing Mile 28.80, shown in Photo 3-1, flows from south to north from a forested wetland, beneath the existing rail ROW, and into a meadow-like landscape. The upstream section was characterized as a slightly meandering channel with mostly flat morphology, abundant canopy cover and some sections of under-cut banks. The substrate upstream of the crossing was comprised predominantly of cobble and sand, and also contained silt and gravel. The downstream section was characterized as a run and pool (approximately one metre deep) section, flowing to a flat (where the watercourse then flows east) that flowed parallel to the existing rail ROW. The downstream section did not show any major signs of erosion.

Photo 3-1: The water in Tannery Creek features low turbidity and large gravel substrate well-suited for fish spawning (Mile 28.80)

A small groundwater seep was observed within the existing rail ROW, downstream of the culvert at Mile 28.80, and contributes to the water quality and quantity in the watercourse. The substrate within 30 metres downstream of the crossing varied depending on its location within the morphology, with cobble being observed in the run and pool section, while finer sediment (silt) was more predominant in the flat section. Pea gravel was also noted in the flat section downstream, and appeared to have been deposited there manually, potentially to provide spawning habitat for resident trout species. Several Brook Trout were observed in the downstream pool section of the watercourse, indicating a cool to cold water thermal regime and relatively high water quality.

The crossing at Mile 31.50, shown in Photo 3-2 was identified as a branch of Tannery Creek, a permanently flowing watercourse. This branch of Tannery Creek generally flows from west to east beneath the existing Barrie rail corridor. The existing rail ROW in the area of the watercourse was characterized by steep banks that lead down to a narrow stone culvert. A debris dam was observed adjacent, upstream of the culvert and provides a seasonal barrier to fish movement. The upstream section of the watercourse flows south, parallel with the existing rail ROW, before it bends east, flowing through the culvert and across St. Andrew's Valley Golf Course. This upstream section was characterized as having a wide (seven metres wetted width), flat morphology, with a predominantly sand, silt, and muck substrate and some sporadic concrete rubble.

Photo 3-2: Branch of Tannery Creek with robust riparian vegetation and canopy cover (Mile 31.50)

Immediately downstream of the crossing, the culvert outlets to a plunge pool and short riffle section that contains gravel, sand, and boulder-sized stone substrate. West of the existing rail ROW, the creek is bordered by mature riparian vegetation and is relatively well shaded, while east of the existing rail ROW, the creek flows through St. Andrew's Valley Golf Course and has a relatively poor riparian system, primarily consisting of grasses.

The crossing of a branch of Tannery Creek at Mile 32.00 is characterized as a permanent watercourse that flows under a concrete bridge. The watercourse generally flows from east to west, in the form of a run. A relatively small pool section was noted approximately 15 metres downstream of the crossing, along the northern bank. A partial dam of the watercourse (formed by wood debris) was noted approximately 25 metres downstream of the crossing. Eroded banks were observed both upstream and downstream along the southern bank, indicating periods of higher flow, likely during storm events.

Though no fish were detected at the Mile 31.50 and Mile 32.00 crossings during the site reconnaissance, it is very likely that fish species inhabit the observed sections of the watercourse.

East Holland River – Mile 33.70

The East Holland River and many of its tributaries originate within the ORM. These watercourses depend on the discharge of the shallow groundwater system to maintain baseflow. This crossing of the East Holland River is located approximately 20 metres north of Timothy Street in the Town of Newmarket. The State of the Watershed Report for the East Holland River Subwatershed (LSRCA, 2000) indicates that the crossing at Mile 33.70 is located in a catchment area that contains the most urbanized land use in the East Holland River subwatershed

(89.9% of catchment area). Not surprisingly, the Provincial Water Quality Monitoring Network (PWQMN) report indicates that this watercourse has relatively poor water quality in the area of the crossing at Mile 33.70.

This section of the East Holland River consists of an upstream and downstream run section flowing through a highly channelized and hardened morphology. Upstream of the crossing, the watercourse generally flows east from two subterranean concrete box culverts, through a concrete and gabion-basket-banked channel beneath the crossing. The substrate in the area is primarily comprised of concrete, cobble, gravel, and sand. A permanent barrier to fish movement, in the form of a dam at Water Street, was identified approximately 200 metres upstream. Fish usage would likely include warm water species due to limited groundwater input, though this watercourse is considered to be permanent direct fish habitat.

West Holland River – Mile 41.00

The crossing at Mile 41.00 of the West Holland River is the final crossing before the watercourse discharges into Cook's Bay (part of Lake Simcoe). Based on background information, this section of the main stem of the West Holland River is identified as having a warm water thermal regime and provides habitat to a diverse range of sportfish. Similar to the East Holland River, the West Holland River is considered large riverine habitat.

Existing conditions observed during the high-rail tour confirmed that this watercourse is permanent, direct fish habitat. The morphology is flat through the entirety of the observed length of the straight channel pattern. Unfortunately, substrate could not be observed during the site reconnaissance due to murky water conditions. However, based on the slow flow and flat morphology, it is expected that the substrate would generally consist of finer-grained material. The riparian area consisted of low-lying wetland-type vegetation (cattails and reeds), and willow trees. Floating woody debris was also noted along the shorelines as were aquatic vegetation including emergent lily pads, floating algae, and submerged Curly-leaved Pondweed (*Potamogeton crispus* L.)

Semi-permanent houseboats and a relatively small marina were observed approximately 100 metres downstream of the crossing. Both the rail and road crossings are relatively close to the water and only allow for small personal watercraft access to upstream sections. Although no fish were observed, this section of the watercourse is considered permanent direct fish habitat for various fish species, including sportfish.

Scanlon Creek – Mile 44.15

The Scanlon Creek drainage network is located within the West Holland River subwatershed and is comprised of the main branch as well as 44 tributary streams. According to the Scanlon Creek Conservation Area Management Plan (LSRCA, 2015), the source of the main branch of the creek originates from Wright's Marsh (a locally significant wetland). There are ten on-line ponds along Scanlon Creek, the largest of which was the former on-line reservoir (approximately 4 ha), approximately 200 metres upstream of the Mile 44.15 crossing (LSRCA, 2011). The reservoir has recently been taken off-line and a constructed channel now conveys flow downstream towards the rail crossing.

The existing rail crossing is characterized as a historic stone and concrete bridge that is aligned in a generally north-south direction. At this crossing location, the watercourse was observed to be flowing very slowly in a west to east direction, with a flat morphology throughout. The watercourse has a relatively level gradient with a wide channel, flowing through adjacent wetlands. Downstream of the crossing, the channel widens to the north, forming a relatively large ponded area, where the watercourse is located to the south, flowing west. The substrate at the crossing is characterized as predominantly fine sediment including muck, silt, and sand. Although no fish were observed during the site reconnaissance, warm water to cool water-tolerant fish are likely to exist within the watercourse.

Based on correspondence with the LSRCA, several fish species were caught in the creek system during the June 20, 2015 Scanlon Creek BioBlitz, including Mottled Sculpin (*Cottus bairdii*), whose presence is an indicator of a cool to cold water thermal regime. The fish were sampled upstream of the crossing, in the constructed channel and upstream of the off-line reservoir.

White Birch Creek – Mile 49.20 and 49.25

Branches of White Birch Creek are crossed at two locations by the existing Barrie rail corridor, near the community (settlement area) of Gilford. Both crossings are located close together and flow from west to east, beneath the rail corridor, discharging into Cook's Bay in Lake Simcoe. The southernmost crossing at Mile 49.20, is characterized as a permanent watercourse that flows east from a wooded area, beneath a small bridge crossing, where it continues to flow east through a meadow. The watercourse exhibits flat morphology, with small sections of runs in the area immediately adjacent up and downstream of the rail crossing. No major evidence of erosion was observed, though the channel does deepen approximately 30 metres downstream as it meanders through the adjacent meadow. During the site reconnaissance, the watercourse was well shaded by shore vegetation including Red Osier Dogwood (*Cornus stolonifera)* and Shrub Willow (*Salix spp*.). The substrate varied across the observed section of watercourse, with finer material observed in the slower-moving, flat sections (silt and sand), and coarser sediment in the run sections (gravel, cobble, and sand).

The northernmost crossing at Mile 49.25 is characterized as a permanent watercourse that flows east from an upstream low-lying area. This watercourse flows beneath the rail corridor to a golf course downstream and was characterized as containing a concrete block barrier to fish movement at the downstream side of the rail track, inhibiting potential fish movement. During the site reconnaissance, this watercourse was flowing slowly, though a relatively wide and shallow ponded area. The upstream channel was observed to be narrow with limited channel definition. The watercourse was well shaded with mature tree and shrub vegetation and the substrate primarily consisted of fine sediment including silt and sand. Trace boulders and large pieces of concrete were also observed within the creek. It is expected that this watercourse receives the majority of its water quantity from upstream wetlands, storm events, and also groundwater during the spring freshet.

The northern branch (Mile 49.30) was described as a defined channel flowing from a small wetland feature. The adjacent land use upstream of the rail crossing was a forested wetland and relatively small ponded area, while the adjacent downstream land use includes the Harbourview Golf and Country Club and a forested wetland. The northern branch contained less flow than the Mile 49.20 crossing and appeared to have lower quality fish habitat. A permanent barrier to fish movement was identified immediately upstream of the existing rail crossing, inhibiting any potential fish movement within the watercourse system.

According to the Innisfil Creeks Subwatershed Plan (LSRCA, 2012a), White Birch Creek is considered one of the healthiest creek systems in the subwatershed, with both fish and benthic invertebrates displaying healthy conditions. In the area of the crossing, White Birch Creek is considered a cool water watercourse with both warm and cold water species having been captured during the LSRCA monitoring. Cyprinid species were observed beneath the bridge during the site reconnaissance, but the species could not be verified in the field.

Wilson Creek – Mile 50.12, 50.36, and 50.86

Similar to White Birch Creek, the Wilson Creek system is located in the Innisfil Creeks subwatershed and discharges to Lake Simcoe. The Wilson Creek system is crossed at three locations by the existing Barrie rail corridor. In each case, the watercourse generally flows from west to east beneath the rail corridor, and all are classified as having a cool water thermal regime in the Innisfil Creeks Subwatershed Plan (LSRCA, 2012a). In general, water flows through each branch were relatively low during the site reconnaissance. The crossings at Mile 50.36 and 50.97 are part of the provincially significant Wilson Creek Marsh Wetland Complex and appear to function as more of a HDF, or ephemeral feature.

The Mile 50.12 crossing is a permanent watercourse that is characterized as a headwater contributor to the provincially significant Wilson Creek Marsh Wetland Complex. It likely conveys flows derived from overland runoff, but primarily receives its water quantity from groundwater discharge. Brook Stickleback (*Culaea inconstans*) were observed during the site reconnaissance and it is likely that this section of watercourse provides habitat for other cool water tolerant fish species.

The Mile 50.36 watercourse crossing is an intermittent feature that provides direct flow to the downstream provincially significant Wilson Creek Marsh Wetland Complex. During the site reconnaissance, this watercourse was not flowing, though a relatively short upstream channel was observed in the agricultural field to the west. It is expected that this watercourse receives the majority of its water quantity from the runoff of adjacent lands, and also groundwater during the spring freshet. This watercourse likely conveys sediment, created by runoff from the adjacent agricultural field, to downstream environments during rain events and snowmelt. No fish were observed, and it is likely that this section of the watercourse does not provide direct habitat to fish. According to data obtained from the MNRF fish-dot information, the watercourse is identified as a low sensitivity watercourse.

The Mile 50.86 watercourse crossing is an intermittent cool water watercourse, and is characterized as a HDF that contributes water during periods of precipitation and the spring freshet. At the time of the site reconnaissance, the channel was completely grassed and likely does not provide direct habitat for fish species. Similar to the Mile 50.36 crossing, this watercourse is also identified as a low sensitivity watercourse based on data obtained from the MNRF.

Carson Creek – Mile 52.12

Carson Creek is crossed by the existing Barrie rail corridor north of the Wilson Creek watercourse system, and also discharges to Lake Simcoe. At the Mile 52.12 crossing, the channel generally meanders from west to east through a box culvert constructed with wingwalls and gabion baskets. The intermittent watercourse flows through a forested corridor and contains some overhanging vegetation and relatively substantial shading from shore cover. The surrounding land use was characterized as agricultural lands and residential development.

At the time of the site reconnaissance, the watercourse appeared to be stagnant and intermittently dry, but contained characteristics of a watercourse. The watercourse morphology was described as flat, with a mean depth of 0.15 metres and a width of 1.3 metres. The substrate was primarily comprised of gravel and sand, and also contained some cobble. Due to low water flow, seasonal migratory obstructions exist within the watercourse and no evidence of major erosion to the banks of the watercourse was noted. According to the Innisfil Creeks Subwatershed Plan (LSRCA, 2012a), the watercourse in the area of the crossing and downstream, is identified as a Type A drain, indicating that it is considered to contain fish and fish habitat, more resilient to drain maintenance (e.g., less sensitive).

The new residential development noted upstream of the watercourse crossing was identified as being a potential reason for the lack of flow observed during the site reconnaissance, however this was not investigated further. Although no fish were observed, and the flow of the watercourse is described as intermittent, the watercourse potentially contains fish and fish habitat. Type A municipal drains indicate a cold/cool temperature, with no sensitive fish species and/or fish communities present.

Belle Aire Creek – Mile 53.28

The watercourse crossing of Belle Aire Creek at Mile 53.28 was observed during the site reconnaissance. The crossing was characterized as a round cement pipe that was greater than two metres in diameter, and conveyed flow from an upstream section of channelized agricultural drain. This potentially intermittent watercourse was observed generally flowing west to east at a very slow velocity (<0.01 m/s). It displayed a flat morphology, with a substrate consisting primarily of muck. No major erosion was observed, and the banks of the stream contained riparian vegetation that provided some shade to the watercourse.

Although no fish were observed, the watercourse potentially provides habitat to low sensitivity fish species at periods throughout the year. Seasonal barriers to fish migration are potentially created during periods of low flow. According to the Innisfil Creeks Subwatershed Plan (LSRCA, 2012a), the watercourse is classified as a Type A municipal drain, indicating that it is considered to contain fish and fish habitat more resilient to drain maintenance. Type A municipal drains indicate a cold/cool temperature, with no sensitive fish species and/or fish communities present.

Hewitt's Creek – Mile 57.41 and 58.33

Two of the upper branches of the Hewitt's Creek system are crossed by the existing Barrie rail corridor, north of Belle Aire Creek, and east of the community (settlement area) of Stroud (Mile 57.41 and Mile 58.33). Both of the watercourses were observed during the high-rail tour and were described as intermittent in nature. However, during periods of flow these watercourses convey water downstream to the permanent cold water main stem of Hewitt's Creek, which is an important cold water watercourse that provides habitat to resident Brook Trout.

The Mile 57.41 crossing is aligned adjacent to agricultural fields and residential properties, and the watercourse was characterized as functioning as a relatively straight, channelized agricultural drain. At the time of the site reconnaissance, the water flow was observed to be very slow. The riparian vegetation primarily consisted of mature trees and shrubs and provided some cover from the shore. No major signs of erosion were noted and the banks appeared stable. The substrate in this watercourse consisted of muck, along with silt and sand. A concrete outlet was observed discharging to this channel approximately 10 metres upstream of the crossing and is believed to flow periodically from a stormwater management pond located approximately 225 metres further upstream.

The watercourse at the Mile 58.33 crossing was dry at the time of the site reconnaissance, but intermittently conveys flow from overland runoff to the downstream wetland, and eventually, the main branch of Hewitt's Creek. This section of the watercourse is classified as a HDF and likely does not provide habitat to fish at any point throughout the year. The upstream section extends for approximately 90 metres south of the crossing and is encompassed within an agricultural field, which is the origin of this branch of the Hewitt's Creek system.

Downstream of the rail crossing, the watercourse flows through a wetland and meadow. Seasonal barriers to fish movement exist in these watercourses periodically throughout the year during times of low flow.

Lovers Creek – Mile 61.20

The main stem of Lovers Creek is crossed by the existing Barrie rail corridor at Mile 61.20. This relatively large creek generally flows from south to north and is crossed by an elevated, clear-span railway bridge before flowing directly into Lake Simcoe, approximately one km north of the rail ROW. According to the Barrie Creeks, Lovers Creek, and Hewitt's Creeks Subwatershed Plan (LSRCA, 2012b), the watercourse provides habitat and is used by various species of cold and warm water fish (Brook Trout, Largemouth Bass), despite having warm water characteristics in the area of the rail corridor ROW. In the same report, benthic communities are described as 'very good' near the mouth, while they vary between 'fairly poor' and 'good' in the headwaters of the various branches (LSCRA, 2012b).

Within 20 metres upstream of the crossing, the watercourse was characterized as having a shallow riffled section that flowed through a relatively straight and stable channel. The substrate was characterized as consisting of gravel, cobble, and sand, and the shore provided good stream cover through mature riparian vegetation, including several large Manitoba Maples.

Within 30 metres downstream of the crossing, the watercourse consisted of variations of run and pool morphology, with substrate consisting of gravel, cobble, and boulder sized sediment. The run sections were approximately 0.3 metres deep, while the pool sections were approximately 0.5 metres deep and ranged between 5 metres to 7 metres in width. Along the eastern shore, adjacent to the rail ROW, a stormwater management outlet was noted. Though not flowing at the time of the site reconnaissance, this outlet discharges to the creek when water levels in the stormwater management pond located east of Cox Mill Road are high.

Whiskey Creek – Mile 62.00

Whiskey Creek is a permanent watercourse and is crossed by the existing Barrie rail corridor near the northernmost extent of the study area. Whiskey Creek has a watershed area of 6.15 km^2, and is approximately 12 km long. Whiskey Creek flows north, through a long section of subterranean CSP culvert, beneath the rail ROW, and discharges to Lake Simcoe, approximately 600 metres north of the crossing.

Whiskey Creek is described in the Barrie Creeks, Lovers Creek, and Hewitt's Creek Subwatershed Plan (LSRCA, 2012b) as having a current and historical presence of Brook Trout and Mottled Sculpin. It is a cool to cold water system that flows through sandy loam soils, with moderate to high infiltration rates. The benthic community is also described as good in the area of the crossing, despite bank hardening and channelization near the mouth.

At the time of the site reconnaissance, the watercourse was relatively wide (approximately four metres) throughout the observed length (approximately 70 metres), with very slow flows (approximately 0.01 m/s). Some mature riparian vegetation was observed adjacent to the watercourse within approximately 20 metres upstream of the crossing, though the creek was relatively uncovered. Within the upstream segment, a shallow riffle section was noted flowing through a cobble and gravel substrate. A permanent concrete barrier to fish movement was also observed in the upstream section restricting fish access to upstream environments year-round.

As mentioned, the watercourse flows subterranean beneath the rail ROW and adjacent gravel-surfaced lot, before re-emerging approximately 60 metres downstream in a woodlot. At the downstream side, the watercourse was characterized as a pool (approximately 0.8 metres deep) containing a sand and muck substrate. Although no fish were observed in this section, the watercourse is reported to provide habitat to a variety of warm and cold water fish species (LSRCA, 2012b).

3.1.3 *Terrestrial Environment*

3.1.3.1 *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 BRCE 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, as shown in Figure 3-3.

The majority of the lands within the existing rail ROW limits are characterized by meadow, young to mid-aged hedgerows and shrub/tree thicket with little to no mature tree cover due to routine vegetation management practices (e.g., brush clearing and spraying of herbicide). Smooth Brome (*Bromus inermis*) and Canada Goldenrod (*Solidago canadensis*) are the predominant ground layer species throughout the vegetation communities within the existing ROW limits, with common early successional grasses and forbs, such as the meadow community shown here in Photo 3-3**Error! Reference source not found.**. Naturally occurring hedgerows are dominated by early successional species of trees: Manitoba Maple (*Acer negundo*) and White Elm (*Ulmus americana*).

Photo 3-3: Cultural meadow adjacent to the corridor (Mile 32.19)

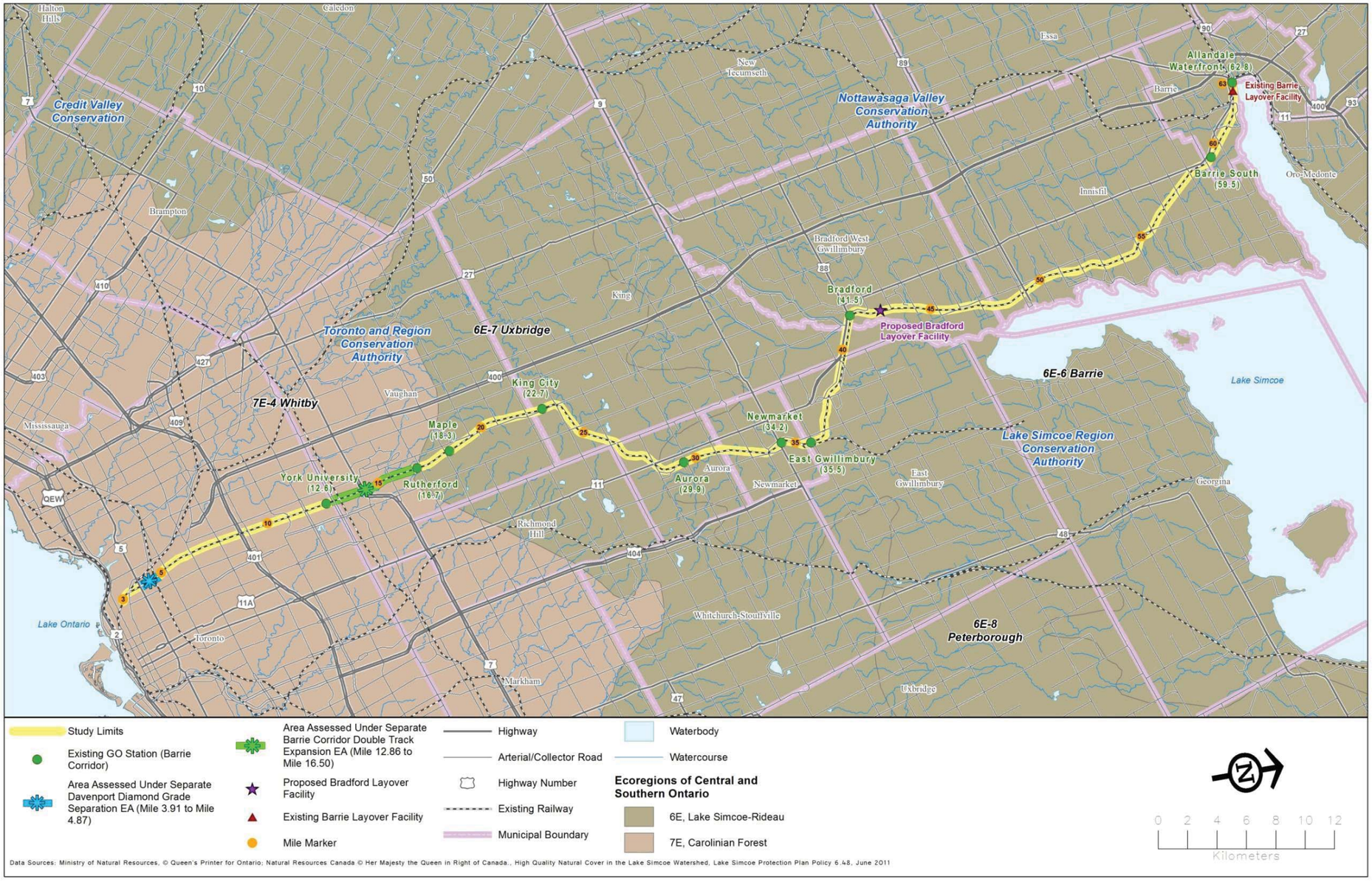

Figure 3-3: Ecoregions of Southern Ontario

In most cases the existing Barrie rail corridor slopes towards or away from adjacent lands, as a result of grade cutting or filling to create a level rail corridor. As a result, the toe or top of slope at the existing property limit is the defining limit between the existing Barrie rail corridor and adjacent land uses. Some of the polygons identified in this study to delineate vegetation communities extend more than a mile along the existing rail ROW limits if the composition remained generally similar (e.g., cultural meadow). Other vegetation community polygons are relatively smaller if the community is distinct from adjacent vegetation communities within the existing ROW limits.

Open-grown trees, hedgerows and wooded areas with relatively older trees are found in locations where the existing rail ROW extends beyond the average width of approximately 20 metres. Additional information on trees within the vegetation communities found within the existing ROW limits, in the context of natural features, is provided in Section 3.1.4 of this EPR.

Lands within 120 metres of the existing Barrie rail corridor (e.g., adjacent lands) vary greatly. Lands beyond the existing ROW limits south of Keele Street in the City of Vaughan (Mile 19.60) are predominantly comprised of residential, industrial, institutional and commercial uses. Natural and naturalized features through this portion of the corridor include parks, marshes and meadows dominated by ornamental trees, early successional groundcovers and manicured turf. The urban centres north of Teston Road (Mile 19.40) include the former community of King City, the Towns of Aurora and Newmarket, former Town of Bradford and the City of Barrie, which have a similar vegetation community composition. Lands north of Keele Street and outside of urban centres are dominated by crop (intensive) agriculture, with the following natural and naturalized communities:

- Pasture/cultural meadow (see Photo 3-3**Error! Reference source not found.**);
- Cultural tree/shrub thicket;
- Deciduous, coniferous and mixed forest;
- Conifer plantation;
- Coniferous, deciduous and mixed swamp;
- Open water (ponds, and large watercourses); and
- Marsh.

The number of vegetation units in each municipality is summarized in Table 3-5.

Cultural communities comprise the majority of the vegetation units present within the study area. In total, there are:

- 202 woodlands (including wooded wetlands and cultural plantations);
- 174 wetlands (including wooded and non-wooded wetlands);
- 38 open water communities (e.g., open water ponds, large riverine environments); and
- 335 cultural communities.

As noted in Table 3-5, the greatest number of natural and non-cultural communities was found within the Town of Innisfil (87). Conversely, the City of Toronto and City of Barrie contain the fewest, with just four and 16, respectively. Each vegetation community (Ecological Land Classification (ELC) unit) was grouped into contiguous (e.g., adjoining) natural features. For example, two different but contiguous wetland types were grouped to form a single wetland complex and were given a single wetland identifier (e.g., WE-1, WE-2, etc.). Woodlands were also grouped into a contiguous woodlands unit and were given woodland identifiers (e.g., W-1, W-2, etc.). It is noted that some treed swamps were considered both a woodland and wetland and were given two different identifiers. Open country communities, including cultural meadows, cultural woodlands, cultural savannahs, and cultural thickets were given an open country identifier (e.g., OC-1, OC-2, etc.). As non-intensive agriculture lands can support some significant habitat, these fields were also given identifiers (e.g., NAG-1, NAG-2, etc.).

The vegetation communities assigned to each complex and identifier are summarized in Table 3-6. These complexes were used to further characterize natural features. For example, the size of each contiguous woodland was calculated along with the amount of any interior habitat present. This information was used to support the evaluation of significant environmental features, summarized in Section 3.1.5 of this EPR.

Table 3-5: Summary of Vegetation Communities

Municipality	Number of Vegetation Communities Present within the Study Area [1]																		
	Woodlands			Wooded Wetlands			Non-wooded Wetlands					Open Water		Cultural Communities					
	Deciduous Forests (FOD) [2]	Mixed Forests (FOM)	Coniferous Forests (FOC)	Deciduous Swamp (SWD)	Mixed Swamp (SWM)[3]	Coniferous Swamp (SWC)	Thicket Swamp (SWT)	Shallow Marsh (MAS)	Meadow Marsh (MAM)	Submerged Shallow Aquatic (SAS)	Mixed Shallow Aquatic (SAM)	Open Aquatic (OAO)	Open Aquatic–Riverine (OAO-R)	Cultural Plantations (CUP)	Cultural Woodland (CUW)	Cultural Savannahs (CUS)	Cultural Thicket (CUT)	Cultural Meadows (CUM)	Non-Intensive Agricultural Fields (NAG)
City of Toronto	2	0	0	0	0	0	0	0	1	0	0	1	0	0	8	0	1	7	0
City of Vaughan	7	2	1	0.5	0.5	0	0	3.5	4	0	0	4	0	6	2	0	2	20	1
Township of King	11	1	0	8.5	2.5	0	1	8.5	8	1	0	4	1	6	17	0	8	7.5	4
Town of Aurora	5.5	5	1	1.5	0	1	0	3	3	0	0	3	0.5	7	8.5	0	2.5	11.5	0
Town of Newmarket	6.5	0	0	2.5	0	0	0	6	7	0	0	0	7	2	14.5	0	8	8	0
Town of East Gwillimbury	6	2	1	6	1	0	4	5	4	0	0	1	2.5	2	8	0	8.5	11	1
Town of Bradford West Gwillimbury	5	6	7	4	2.5	0	4	5	6	0	1	6	1	6	11	0	17	16	3
Town of Innisfil	5	10	4	30	5.5	3	17	7	1	2	0	3	0	5	28	0	17	13	9
City of Barrie	4	3	2	0	1	0	1	1	0	0	0	4	0	1	11	0	6	10	0
TOTAL	52	29	16	53	13	4	27	39	34	3	1	26	12	35	108	0	70	104	18

[1] Vegetation communities located partially in two municipalities were counted as one half for each respective municipality.
[2] Vegetation community short forms refer to identification codes provided in the ELC System for Southern Ontario (Lee, et. al., 1998) and are shown in the NER.
[3] For the purposes of this section, SWM refers to mixed swamp, rather than stormwater management, as indicated in the glossary.

Table 3-6: Vegetation Community Complexes

Natural Features/Complexes	Identifier	Vegetation Community Included in each Complex Type
Woodlands	W	Deciduous Forest (FOD), Mixed Forest (FOD), Coniferous Forest (FOD), Deciduous Swamp (SWD), Mixed Swamp (SWM), Coniferous Swamp (SWC), Cultural Plantation (CUP)
Wetlands	WE	Deciduous Swamp (SWD), Mixed Swamp (SWM), Coniferous Swamp (SWC), Thicket Swamp (SWT), Shallow Marsh (SAM), Meadow Marsh (MAM), Submerged Shallow Aquatic (SAS), Mixed Shallow Aquatic (SAM), Open Aquatic (OAO)
Open Country	OC	Cultural Meadow (CUM), Cultural Thicket (CUT), Cultural Savannah (CUS), Cultural Woodland (CUW)
Non-intensive Agricultural Lands	NAG	Pasture lands, mature hay fields, fallow fields.

3.1.4 Tree Inventory

A comprehensive tree inventory was completed for the entire BRCE study area. A copy of the Tree Inventory Plan and Arborist Report is provided in Appendix B of this EPR. Trees immediately within the existing Barrie rail corridor or at the property limit were generally noted as early successional species which were likely a result of self-seeding from the surrounding landscape. Manitoba Maple (*Acer negundo*) and White Elm (*Ulmus americana*) were found throughout the corridor. Barrie rail corridor sections through urban areas were found to be subject to invasion by non-native species from adjacent yards and natural areas. Species such as Siberian Elm (*Ulmus pumila*), Tree-of-Heaven (*Ailanthus altissima*), Norway Maple (*Acer platanoides*) and Scots Pine (*Pinus sylvestris*) were found as trees or within the regenerating shrub and sapling layer. Rural areas were more likely to contain Apple (*Malus pumila*), Green Ash (*Fraxinus pennsylvanica*) and Trembling Aspen (*Populus tremuloides*).

The majority of trees in the Barrie rail corridor and on land immediately adjacent to the corridor (e.g., the extent of the existing grading limits) were observed to range between 10 to 30 cm Diameter at Breast Height (DBH), and generally in good condition. For trees observed to be greater than 30 cm DBH, Sugar Maple (*Acer saccharum*), White Spruce (*Picea glauca*) and Eastern White Pine (*Pinus strobus*) were generally found to be in good condition, whereas older individuals of Siberian Elm and Manitoba Maple were assigned fair to poor condition ratings. Trees within TRCA and LSRCA regulated areas that were found to be 10 cm and smaller were sparse in the assessed portion of the existing and proposed ROW. The coniferous swamps had canopies created by mature White Cedar (*Thuja occidentalis*) that precludes most woody vegetation from establishing. Mixed and deciduous swamps were observed to be comprised of different poplar species greater than 10 cm and/or populated by dense to sparse shrub species. Marshes, which are defined as having a tree and shrub canopy of 25% or less, were Reed Canary Grass or sedge dominated.

Trees beyond the existing Barrie rail corridor growing at the edges of forests, plantations and swamps (in some cases) were typically growing immediately behind the property fence line. Some of these trees comprise protected greenlands, natural heritage features and wildlife habitat which is further discussed within the NER in Appendix A of this EPR. A summary of the adjacent land conditions that the assessed trees are growing within is provided below by municipality:

- *City of Toronto:* Trees are found mainly in hedgerows and individual trees growing on or adjacent to residential, institutional and industrial land uses. Trees are also present within ravines and municipal parks;
- *City of Vaughan:* Trees are found mainly in hedgerows growing on or adjacent to residential and industrial land uses. A portion of the north end of the City is occupied by crop agriculture with sparse hedgerows and individual trees near the existing ROW limits;
- *Township of King:* Trees are growing within swamps and forests, crop agriculture, and residential lands;
- *Town of Aurora:* Trees are found mainly in hedgerows growing on or adjacent to residential, and industrial land uses;
- *Town of Newmarket:* The majority of lands along the rail corridor are parklands and residential with a relatively smaller representation of commercial and industrial lands. Trees are primarily found within parks and adjacent to rivers in the study area. Residential trees are also present;
- *Town of East Gwillimbury*: Crop agriculture with sparse tree cover at the field edges and dense to regenerating natural treed features are the predominant land type, with minor residential land;
- *Town of Bradford West Gwillimbury*: Crop agriculture with very sparse tree cover at the field edges and dense treed features are the predominant land type, with minor residential land;
- *Town of Innisfil:* Lands are predominantly crop agriculture, with some representation by wooded natural heritage features and residential lands; and
- *City of Barrie:* The majority of lands abutting the rail corridor are residential with a few remnant wooded areas and treed ravines.

A total of 35 Butternut (*Juglans cinera)* trees were identified within or immediately adjacent to the existing ROW during the 2015 site investigations. As such, they may be affected by the proposed construction of the BRCE Project. Butternut is listed as Endangered under the ESA (2007) and is protected from being killed, harmed, or removed. Data collected for each tree included DBH, on-site or off-site, anticipated effect, and a preliminary assessment of retainability based on seasonal-evident observations. These trees are discussed further in Section 3.1.5 and additional data is provided in the Tree Inventory Plan and Arborist Report, which is located within Appendix B of this EPR.

3.1.5 Significant Natural Features

This section summarizes the observations and findings of the site investigations and indicates which specific features on the landscape are considered to be Provincially Significant. To evaluate provincial significance each woodland, wetland, open country environment and non-intensive agricultural field was subjected to criteria outlined in a variety of guidance documents including:

- The Natural Heritage Reference Manual (NHRM) (MNRF, 2010);
- The Significant Wildlife Habitat (SWH) Technical Guide (MNR, 2000);
- SWH Criteria Schedules for Ecoregion 6E (MNRF, 2015);
- SWH Criteria Schedules for Ecoregion 7E (MNRF, 2015);
- Oak Ridges Moraine Technical Paper 2 - SWH (MMAH, n.d.); and
- Technical Definitions and Criteria for Identifying Key Natural Heritage Features (KNHFs) and Key Hydrologic Features (KHFs) for the Lake Simcoe Protection Plan (LSPP) (MNRF, 2015).

In some cases significance could be confirmed, while in other cases it was only possible to determine if a feature was potentially significant. In these cases, the feature was identified as a “Candidate Significant Feature”. The criteria applied to each feature type to determine significance and the findings of the assessment are presented below.

3.1.5.1 Wetlands and Provincially Significant Wetlands

A total of 174 wetlands were identified within the study area. Of these, 57 individual wetlands were part of six known Provincially Significant Wetland Complexes, including the following:

- King-Vaughan Wetland Complex;
- Eaton Hall-Mary-Hackett Lakes Wetland Complex;
- Aurora (McKenzie) Marsh Wetland Complex;
- Holland Marsh Wetland Complex;

- Wilson Creek Marsh Wetland Complex; and
- Little Cedar Point Wetland Complex.

A wetland summary is presented in Table 3-7 by municipality. Photo 3-4 depicts one of the many unevaluated wetlands in the study area.

Photo 3-4: Unevaluated wetland in the study area (Mile 54.84)

Table 3-7: Wetland Summary

Municipality	Provincially Significant Wetlands Present	Number of Individual Wetlands within Provincially Significant Wetland Complexes[1]	Number of Unevaluated Wetlands and Evaluated Non-PSWs
City of Toronto	• None Present	0	1
City of Vaughan	• King-Vaughan Wetland Complex	4.5	4
Township of King	• King-Vaughan Wetland Complex • Eaton Hall-Mary-Hackett Lakes Wetland Complex • Holland Marsh Wetland Complex • Aurora (McKenzie) Marsh Wetland Complex	15.5	14
Town of Aurora	• Aurora (McKenzie) Marsh Wetland Complex	3.5	5
Town of Newmarket	• None Present	0.5	15
Town of East Gwillimbury	• Holland Marsh Wetland Complex	6	14
Town of Bradford West Gwillimbury	• Holland Marsh Wetland Complex	5.5	17
Town of Innisfil	• Holland Marsh Wetland Complex • Wilson Creek Marsh Wetland Complex • Little Cedar Point Wetland Complex	21.5	44
City of Barrie	None Present	0	3
TOTAL		57	117

[1] *Wetlands located partially in two municipalities were counted as one half for each respective municipality.*

3.1.5.2 Significant Woodlands

Within the study area, 202 woodlands were identified, made up of a variety of deciduous, coniferous and mixed forests and plantation areas. A greater number of woodlands and larger woodlands were present within the northern portions of the study area, with more woodlands located in rural regions rather than urban environments. It is noted that treed swamps are both woodlands and wetlands. Thus, some of the wetlands described and evaluated in the previous section coincide with woodlands evaluated in this section.

Of the 202 woodlands in the study area, 89 were identified as Significant. A summary of all woodlands is provided Table 3-8.

Table 3-8: Woodland Summary

Municipality	Number of Significant Woodlands[1]	Number of Non-Significant Woodlands[1]	Criteria Used to Determine Significance
City of Toronto	1	1	Size Criteria based on NHRM (Ministry of Natural Resources (MNR), 2010)
City of Vaughan	7	10	York Region Significant Woodlands Mapping
Township of King	7	22	York Region Significant Woodlands Mapping
Town of Aurora	11.5	9.5	York Region Significant Woodlands Mapping, Town of Aurora OP Schedules E and E1
Town of Newmarket	7.5	3.5	York Region Significant Woodlands Mapping
Town of East Gwillimbury	16	2	York Region Significant Woodlands Mapping
Town of Bradford West Gwillimbury	6.5	24	Size Criteria based on Greenbelt Plan/Lake Simcoe Protection Plan (LSPP) Guidance Documents
Town of Innisfil	29.5	33	Innisfil Significant Woodlands Mapping
City of Barrie	3	8	Size Criteria Based on LSPP Guidance Document
TOTAL	89	113	

[1] Woodlands located partially in two municipalities were counted as one half for each respective municipality.

3.1.5.3 *Significant Valleylands*

A Valleyland is a natural depression in the landscape that provides structure to a watershed. They are associated with a watercourse and vary in size from small headwater features to wide spans containing substantial rivers. Valleylands provide hydrological conveyance and also provide important ecological linkage functions.

Within the TRCA's jurisdiction, Significant Valleylands were confined to only a small number of locations in the BRCE Project study area, namely, in the area of Mile 8.50 (near Maple Leaf Creek, Westminster Creek (approximately Mile 16.70), and the East Humber River and its tributaries (approximately Mile 24.00 to Mile 25.50). Within the LSRCA jurisdiction, 13 Valleyland crossings were identified. Significant Valleylands found within the BRCE Project study area are summarized below in Table 3-9.

Table 3-9: Significant Valleylands

Municipality	Approximate Mile Marker in Barrie Rail Corridor[1]	Conservation Authority Jurisdictions	Associated Watercourse	Within Oak Ridges Moraine Plan Area	Within Greenbelt Plan Area	Within Lake Simcoe Protection Plan Area
City of Toronto	8.13	TRCA	Maple Leaf Creek	No	No	No
City of Vaughan	16.70	TRCA	Westminster Creek	No	No	No
Township of King	23.26	TRCA	Tributary of East Humber River	Yes	Yes	No
	23.94	TRCA	Tributary of East Humber River	Yes	Yes	No
	24.80	TRCA	Tributary of East Humber River	Yes	Yes	No
Town of Aurora	28.66	LSRCA	Tannery Creek	Yes	Yes	Yes
	31.39	LSRCA	Tannery Creek	No	No	Yes
Town of Newmarket	31.95	LSRCA	Tannery Creek	No	No	Yes
	32.19	LSRCA	Tributary of East Holland River	No	No	Yes
	34.49	LSRCA	East Holland River	No	No	Yes
Town of East Gwillimbury	35.67	LSRCA	East Holland River	No	No	Yes
	36.60	LSRCA	East Holland River	No	No	Yes
	36.97	LSRCA	Tributary of East Holland River/East Holland River	No	No	Yes
Town of Bradford West Gwillimbury	43.98	LSRCA	Scanlon Creek	No	No	Yes
	45.53	LSRCA	Tributary of West Holland River	No	No	Yes

Municipality	Approximate Mile Marker in Barrie Rail Corridor[1]	Conservation Authority Jurisdictions	Associated Watercourse	Within Oak Ridges Moraine Plan Area	Within Greenbelt Plan Area	Within Lake Simcoe Protection Plan Area
Town of Innisfil	58.25	LSRCA	Hewitt's Creek	No	No	Yes
City of Barrie	61.02	LSRCA	Lovers Creek	No	No	Yes
	61.91	LSRCA	Whiskey Creek	No	No	Yes

[1]Mile markers refer to the centre of the valley feature and may not correspond exactly with the associated watercourse crossing.

3.1.5.4 *Areas of Natural and Scientific Interest*

An ANSI is an official designation made by the Government of Ontario that is applied to contiguous geographical regions that have significant ecological features that are representative locally, regionally, or provincially. There are two distinct designations: Earth Science ANSIs, which exhibit unique geologic features (e.g., geomorphology), and Life Science ANSIs, which exhibit unique ecologic features (e.g., biodiversity).

There were no Earth Science ANSIs present within the study area. Three Life Science ANSIs were identified; two of which (Maple Uplands and Kettles, and Holland Landing and Fen Wetlands) are considered to be Candidate ANSIs, which are provincial-level ANSIs that the MNRF has identified and recommended for protection, but have not yet been formally confirmed. The Holland River Marsh ANSI is classified as a Provincial Life Science ANSI. Each of these ANSIs is summarized in Table 3-10. It is noted that the ANSIs correspond with previously identified woodlands and wetlands.

Table 3-10: Areas of Natural and Scientific Interest

Municipality	Approximate Mile Marker in Barrie Rail Corridor	ANSI Name	ANSI Type	Area (ha)
City of Toronto	None Present	Not Applicable	Not Applicable	Not Applicable
City of Vaughan/Township of King	21.75 – 22.60	Maple Uplands and Kettles	Candidate ANSI (Provincial Life Science)	58.00
Town of Aurora	None Present	Not Applicable	Not Applicable	Not Applicable
Town of Newmarket	None Present	Not Applicable	Not Applicable	Not Applicable
Town of East Gwillimbury	38.40 – 38.60	Holland Landing and Fen Wetlands	Candidate ANSI (Provincial Life Science)	156.00
Town of Bradford West Gwillimbury	47.25 - 48.60	Holland River Marsh	Provincial Life Science ANSI	1022.00
Town of Innisfil	None Present	Not Applicable	Not Applicable	Not Applicable
City of Barrie	None Present	Not Applicable	Not Applicable	Not Applicable

3.1.5.5 *Significant Wildlife Habitat in Ecoregions 7E and 6E Outside of the Oak Ridges Moraine Conservation Plan Area*

There are a number of SWH types that require detailed site investigation to identify micro-habitat features such as nests, hibernaculum, vegetation age classification or species-specific identification. Due to the site access limitations within the study area outside of the existing rail ROW, the following SWH types have potential to be within the study area but neither Candidate nor Confirmed Significant Habitats could be identified (a brief justification is also provided).

- *Snake Hibernaculum* - requires identification of rock piles, stone fences, and crumbling foundations that were not visible from the ROW;
- *Rare Woodland Types* - ELC vegetation communities were only mapped to the Ecosite level due to site access restrictions, therefore rarity could not be confirmed; and
- *Additional Rare Forest and Vegetation Types* - ELC vegetation communities were only mapped to the Ecosite level due to site access restrictions, therefore, rarity could not be confirmed.

Candidate and Confirmed SWHs identified in the study area are summarized in Table 3-11 and Table 3-12, respectively.

3.1.5.6 *Significant Wildlife Habitat in the Oak Ridges Moraine Conservation Plan Area*

Within the Oak Ridges Moraine Conservation Plan (ORMCP) Area, SWH was identified in portions of the study area separately as the criteria applied are different than in other regions. Some habitats are similar and could not be identified for the purposes of this study due to site access limitations. These included:

- Colonial Nesting Bird Habitat;
- Snake Hibernaculum;
- Rare Vegetation communities;
- Colonial Nesting Bird Sites;
- Raptor Nesting Sites;
- Raptor Nesting Associated with Woodland Habitats;
- Turtle Nesting and Overwintering Areas;
- Seeps and Springs; and
- Animal and Plant Movement Corridors All species.

A variety of other SWH types were identified as summarized in Table 3-13. Due to site access limitations, some types of SWH could not be identified, even as Candidate sites. These included Reptile Hibernacula and rare vegetation communities as these can only be identified through more detailed on-site field investigations. Candidate and Confirmed SWHs which are identified in the ORMCP Area are summarized in Table 3-13 and Table 3-14, respectively.

Table 3-11: Number of Candidate Significant Wildlife Habitats in Ecoregions 7E and 6E Outside of the Oak Ridges Moraine[1]

Municipality	Waterfowl Stopover and Staging Areas (Terrestrial)	Waterfowl Stopover and Staging Areas (Aquatic)	Shorebird Migratory Stopover Areas	Raptor Wintering Areas	Bat Hibernacula	Bat Maternity Colony Habitat	Bat Migratory Stopover Areas	Turtle Wintering Areas	Turtle Wintering Area (After Site Investigations)	Reptile Hibernaculum	Colonially-Nesting Bird Breeding Habitat (Bank and Cliff)	Colonially-Nesting Bird Breeding Habitat (Tree/Shrub)	Colonially-Nesting Bird Breeding Habitat (Ground)	Migratory Butterfly Stopover Area	Landbird Migratory Stopover Area	Deer Wintering and Yarding	Cliffs and Talus Slopes	Sand Barren	Alvar	Savannah	Tallgrass Prairie	Waterfowl Nesting Areas	Woodland Raptor Nesting Habitat	Turtle Nesting Areas	Amphibian Breeding Habitat (Woodland)	Amphibian Breeding Habitat (Wetland)	Woodland Area Sensitive Breeding Bird Habitat	Marsh Breeding Bird Habitat	Open Country Breeding Bird Habitat	Shrub/Early Successional Bird Breeding Habitat
City of Toronto	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
City of Vaughan	0	2	0	0	0	11	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	1	4	0	0
Township of King	0	4	0	0	0	23	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	5	3	4	0	0
Town of Aurora	0	3	0	3.5	0	13.5	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	2	0	1.5
Town of Newmarket	0	6	0	7.5	0	8.5	0	17.5	17.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	13	0	13	0	9
Town of East Gwillimbury	0	7	0	10	0	16	0	14.5	14.5	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	12	12	0	8	0	2.5
Town of Bradford West Gwillimbury	0	5	0	28	0	26	0	12	12	0	0	0	0	0	0	32	0	0	0	0	0	0	5.5	0	11.5	12	9.5	8	0	9
Town of Innisfil	0	16	0	8	0	57.5	0	29	29	0	0	0	0	0	0	13	0	0	0	0	0	0	1.5	0	52.5	30	11.5	10	0	9
City of Barrie	0	1	0	0	0	10	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	1	0	3
TOTAL	0	44	0	57	0	167	0	90	87	0	0	0	0	0	0	56	0	0	0	0	0	0	7	0	96	84	25	50	0	35

[1] Habitats located partially in two municipalities were counted as one half for each respective municipality.

Table 3-12: Number of Confirmed Significant Wildlife Habitats in Ecoregions 7E and 6E Outside of the Oak Ridges Moraine[1]

Municipality	Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Terrestrial Crayfish	Amphibian Breeding Habitat (Woodland)	Amphibian Breeding Habitat (Wetland)	Seeps and Springs
City of Toronto	0	0	0	0	0
City of Vaughan	0	0	0	0	0
Township of King	1	0	0	1	0
Town of Aurora	0	0.5	0	0	0
Town of Newmarket	7	0.5	0	0	0
Town of East Gwillimbury	9	0	0	0	0
Town of Bradford West Gwillimbury	3.5	0	0	0	0
Town of Innisfil	2.5	0	2	1	1
City of Barrie	0	0	0	0	0
TOTAL	23	1	2	2	1

[1] Habitats located partially in two municipalities were counted as one half for each respective municipality.

Table 3-13: Number of Candidate Significant Wildlife Habitats in the Oak Ridges Moraine Conservation Plan Area

Municipality	Waterfowl Stopover and Staging Areas (Terrestrial)	Raptor Wintering Areas	Colonial Nesting Bird Habitat	Waterfowl Nesting Area	Snake Hibernaculum	Rare Woodland Types/Rare Forest Types	Amphibian Woodland Breeding Habitat (Vernal Pools)	Brown Thrasher	Field Sparrow	Western Meadowlark Habitat	Upland Sandpiper	Waterfowl Stopover and Staging Areas (Aquatic)	White-tailed Deer Habitat	Great Blue Heron Nesting Sites	Sedge Wren Nesting Sites	Marsh Wren Nesting Sites	Interior Forest Breeding Bird Habitats	Open Country Breeding Bird Habitats	Wetland Breeding Bird Habitats	Amphibian Breeding Habitat (Wetland)	Raptor Nesting (Wetland, Lakes, Ponds & Rivers)	Raptor Nesting (Woodlands)	Turtle Nesting Habitat and Overwintering Areas	TNHOWA (After Site Investigations)	Bullfrog Habitat	Ruffed Grouse Habitat
City of Toronto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Vaughan	0	0	0	4	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2
Township of King	0	0	0	18	0	0	15	0	0	1	0	4	0	0	6	6	0	1	6	6	0	5	6	2	6	6
Town of Aurora	0	1	0	0	0	0	12	0	0	1	0	0	0	0	2	2	0	4	2	2	0	4	2	0	2	2
Town of Newmarket	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town of East Gwillimbury	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town of Bradford West Gwillimbury	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town of Innisfil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Barrie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**1**	**0**	**22**	**0**	**0**	**34**	**0**	**0**	**2**	**0**	**4**	**0**	**0**	**8**	**8**	**0**	**5**	**8**	**8**	**0**	**12**	**8**	**2**	**8**	**10**

Table 3-14: Number of Confirmed Significant Wildlife Habitats in the Oak Ridges Moraine Conservation Plan Area

Municipality	Terrestrial Crayfish	Amphibian Breeding Habitat (Vernal Pools)	Amphibian Breeding Habitat (Wetland)
City of Toronto	0	0	0
City of Vaughan	0	0	0
Township of King	1	1	1
Town of Aurora	0	0	0
Town of Newmarket	0	0	0
Town of East Gwillimbury	0	0	0
Town of Bradford West Gwillimbury	0	0	0
Town of Innisfil	0	0	0
City of Barrie	0	0	0
TOTAL	**1**	**1**	**1**

3.1.5.7 *Special Concern and Rare Wildlife Species*

The term “species of conservation concern” (SCC) is defined under the NHRM (MNR, 2010) as follows:

- The habitat of species that are rare or substantially declining, or have a high percentage of their global population in Ontario;
- Special Concern species identified under the ESA, 2007 on the Species at Risk in Ontario (SARO) List, which were formally referred to as “vulnerable” in the SWH Technical Guide (SWHTG), (MNR, 2000); and
- 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, 2007.

The habitats of SCC are protected both inside and outside of the ORMCP Area. The definition for SCC excludes habitats of Endangered and Threatened species covered under the PPS (2014), specifically, Policy 2.1.3(a).

In total, 17 SCC were identified as potentially being present within the study area as shown in Table 3-15.

Table 3-15: Species of Conservation Concern

	Species of Conservation Concern
Birds	Black Tern (*Chlidonias niger*); Canada Warbler (*Cardellina canadensis*); Common Nighthawk; Eastern Wood-peewee (*Contopus virens*); Golden-winged Warbler (*Vermivora chrysoptera*); Grasshopper Sparrow (*Ammodramus savannarum*); Peregrine Falcon (*Falco peregrinus*); Red-headed Woodpecker (*Melenerpes erythrocephalus*); Wood Thrush (*Hylocichla mustelina*); and Yellow Rail (*Coturnicops noveboracensis*).
Insects	Amber-winged Spreadwing (*Lestes eurinus*); Green-striped Darner (*Aeshna canadensis*); Lilypad Clubtail (*Arigomphus furcifer*); and, Painted Skimmer (*Libellula semifasciata*).
Plants	Fogg’s Goosefoot (*Chenopodium foggii*).
Reptiles and Amphibians	Snapping Turtle; and Western Chorus Frog.

Of the 17 species originally identified as potentially being present, Candidate Significant Habitat was only found for 13 species as summarized in Table 3-16 and Confirmed Significant Habitat was only found for the Western Chorus Frog as summarized in Table 3-17.

Table 3-16: Number of Candidate Significant Habitats for Species of Conservation Concern[1]

Municipality	Eastern Wood Peewee	Canada Warbler	Wood Thrush	Grasshopper Sparrow	Red-headed Woodpecker	Golden-winged Warbler	Lilypad Clubtail	Painted Skimmer	Amber-winged Spreadwing	Green-striped Darner	Snapping Turtle	Fogg's Goosefoot	Western Chorus Frog
City of Toronto	0	0	1	0	0	0	0	0	0	0	0	0	0
City of Vaughan	11.5	0	7	0	0	0	0	2	0	1	0	0	6
Township of King	37.5	0	4	0	0	0	2	1	1	3	7	0	18
Town of Aurora	20	0	6.5	0	0	0	0	0	0	0	4.5	0	8
Town of Newmarket	21	0	3.5	0	0	0	0	0	0	0	17	0	21
Town of East Gwillimbury	22	12	7	0	0	0	2	0	1	3	14.5	0	24
Town of Bradford West Gwillimbury	28	5.5	10	0	45	45	0	0	0	1	14	0	23.5
Town of Innisfil	73	16.5	11	0	58	58	5	0	1	0	30	0	82.5
City of Barrie	18	0	3	0	27	27	0	0	0	0	3	1	5
TOTAL	231	34	53	0	130	130	9	3	3	8	90	1	**188**

[1] Habitats located partially in two municipalities were counted as one half for each respective municipality.

Table 3-17: Number of Significant Habitats for Species of Conservation Concern (Western Chorus Frog)

Municipality	Western Chorus Frog
City of Toronto	0
City of Vaughan	0
Township of King	0
Town of Aurora	1
Town of Newmarket	0
Town of East Gwillimbury	3
Town of Bradford West Gwillimbury	1
Town of Innisfil	3
City of Barrie	0
TOTAL	8

3.1.5.8 *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, 2007 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, 2007 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, 2007 with potential to be present within the study area were identified based on correspondence with the MNRF. In total, 16 Endangered and Threatened species were identified as potentially being present within the study area as shown in Table 3-18.

Table 3-18: Endangered and Threatened Species

	Endangered and Threatened Species
Birds	Bank Swallow (*Riparia riparia*); Barn Swallow; Bobolink; Chimney Swift; Eastern Meadowlark; Eastern Whip-poor-will (*Anthrostomus vociferus*); King Rail (*Ixobrychus exilis*); and Least Bittern (*Rallus elegans*).
Mammals	Little Brown Myotis; Northern Myotis; and Tri-colored Bat (*Perimyotis subflavus*).
Reptiles and Amphibians	Blanding's Turtle.
Plants	Butternut and a Sensitive Species (not identified further due to the sensitive nature of this plant species).
Fish	Redside Dace and American Eel (*Anguilla rostrata*).

With the exception of American Eel and the noted Sensitive Species, Candidate Significant Habitats were identified for each of the species listed. Significant and Candidate Significant Habitats are summarized in Table 3-19. Further details regarding these species are provided in the NER located within Appendix A of this EPR.

Table 3-19: Number of Candidate Significant and Significant Habitats for Endangered and Threatened Species[1]

Municipality	Bank Swallow	Barn Swallow[2]	Bobolink	Chimney Swift	Eastern Meadowlark	Eastern Whip-poor-will	King Rail	Least Bittern	Little Brown Myotis, Northern Myotis, Tri-colored Bat	Blanding's Turtle	Butternut[3]	Sensitive Species	Redside Dace[4]	American Eel
City of Toronto	0	0	1	Several suitable chimneys may be present	2	0	0	0	2	0	0	0	0	0
City of Vaughan	1	0	0	0	0	0	0	0	11	2.5	0	0	1	0
Township of King	0	0.5	1	0	4	1	3	3	23	15.5	11	0	2	0
Town of Aurora	0	0	2.5	0	4.5	0	0	0	13.5	4	4	0	0	0
Town of Newmarket	0	1	1	0	5	0	0	0	8.5	12	3	0	0	0
Town of East Gwillimbury	0	0	1.5	0	6.5	4	9	9	16	14	6	0	0	0
Town of Bradford West Gwillimbury	0	0.5	4	0	9	5	12	12	25.5	22.5	7	0	0	0
Town of Innisfil	0	0	3	0	13	13	8	8	57.5	65.5	2	0	0	0
City of Barrie	0	0	0	0	0	3	1	1	10	3	2	0	0	0
TOTAL	1	2	14	Unconfirmed	44	26	33	33	167	139	35	0	3	0

[1] Habitats located partially in two municipalities were counted as one half for each respective municipality.

[2] Nesting habitats were confirmed during site investigations.

[3] Butternut trees were identified. A Butternut Health Assessment (BHA) is required to confirm whether the trees are retainable.

[4] Habitats are mapped by the MNRF and are known to be present.

3.1.5.9 Natural Heritage Systems

Natural Heritage Systems (NHSs) are an ecologically based grouping of nature and natural functions. The PPS (2014) defines a NHS as:

> *A system made up of natural heritage features and areas, and the linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems. These systems can include natural heritage features and areas, federal and provincial park and conservation reserves, other natural heritage features, lands that have been restored or have the potential to be restored to a natural state, areas that support hydrologic functions, and working landscapes that enable ecological functions to continue. (PPS, 2014, page 45).*

Within the study area, NHSs have been identified in the ORMCP and Greenbelt Plan. Each NHS is described in the following sections.

Oak Ridges Moraine Conservation Plan Natural Core and Natural Linkage Areas

The ORMCP includes Natural Core Areas and Natural Linkage Area designations. The purpose of each area is as follows:

- *Natural Core Areas*: to maintain and where possible improve or restore the integrity of the Plan Area; and
- *Natural Linkage Areas:* to maintain, and where possible improve or restore the ecological integrity of the Plan Area and to maintain and where possible improve or restore regional scale open space linkages between Natural Core Areas and along river valleys and stream corridors.

The Barrie rail corridor lies within a Natural Core Area in the northern portion of the City of Vaughan and the southern portion of the Township of King (Mile 21.80 to 22.70). This area corresponds with the provincially significant King-Vaughan Wetland Complex, and the Maple Uplands and Kettles Provincial Life Science ANSI. This area also includes the headwaters of the East Humber River. The King City GO Station is located within the Natural Core Area. No new transit stations are permitted within Natural Core Areas; however, upgrades to existing stations are permitted.

The Barrie rail corridor also lies within two Natural Linkage Areas, as follows:

- Area 1: Mile 21.30 to 22.00: Includes agricultural lands between Kirby Road and King-Vaughan Road; and
- Area 2: Mile 23.60 to Mile 25.50: Located to the northeast of King City between Dufferin Street and Bathurst Street. This area primarily consists of farmland with a small woodlot and open fields associated with the rural Country Day School property. The East Humber River crosses the corridor through this area.

Greenbelt Plan Natural Heritage System

The Greenbelt Plan identifies a NHS that includes, “areas of the Protected Countryside with the highest concentration of the most sensitive and/or significant natural features and functions” (MMAH, 2005, page 16). The NHS is designed to protect significant natural features and the connections between them. The NHS includes the Don River corridor where it crosses the Barrie rail corridor near Mile 20.90 in the City of Vaughan. The NHS also includes a large natural area and unevaluated wetland north of Bathurst Street in the northern portion of the Township of King as well as the West Holland River corridor at Mile 41.00, several unevaluated wetlands and the provincially significant Holland Marsh Wetland Complex, the Scanlon Creek Conservation Area, Deer Wintering Habitat identified by the MNRF and the Holland River Marsh Provincial Life Science ANSI between Miles 41.00 and 49.00. In order to support connections, the Greenbelt Plan also identifies key river valleys that run through urban areas. These urban rivers have an important linkage function on the landscape. River valley linkages cross the study area in the following locations, as shown in Figure 3-4.

- Mile 31.39: Tannery Creek valley crossing in the Town of Aurora;
- Mile 32.01: East Holland River valley crossing in the Town of Newmarket;
- Mile 32.19: East Holland River tributary valley crossing in the Town of Newmarket; and
- Mile 32.50 to 38.52: East Holland River valley corridor follows within 120 metres of the rail corridor and crosses in several locations through this stretch.

3.1.5.10 Ecological Linkages

The three provincial plans relevant to the study area (the Greenbelt Plan, ORMCP, and LSPP) include policies to protect or improve ecological linkages and corridors across the landscape. These policies are discussed in further detail in the NER provided in Appendix A of this EPR.

Linkages are important in allowing wildlife to move between key habitats required for different stages of their life cycle (e.g., breeding areas, summer foraging and winter areas). Linkages also allow movement between populations which help increase and maintain diversity. Due to the linear nature of the BRCE rail corridor, culverts and bridges provide the primary linking structure and passage across the corridor. Existing and potential ecological linkages were identified at culverts and bridges where Significant or Candidate Significant features were present on both sides of the corridor in areas associated with:

- Significant Valleylands, described in Section 3.1.5.3;
- ORMCP Natural Linkages Areas, described in Section 3.1.5.6; and
- Greenbelt Plan River Valley Linkages, described in Section 3.1.5.9.

Fourteen primary linkage or wildlife crossing areas were identified along the corridor as summarized in Table 3-20.

Table 3-20: Ecological Linkages Crossing the Barrie Rail Corridor

Municipality	Mile Marker in Barrie Rail Corridor	Conservation Authority Jurisdiction	Associated Watercourse	Significant Valleyland	ORMCP Natural Linkage Area	Greenbelt Plan River Valley Connection	Natural Features Linked	Condition of Linkage	Improved Linkage (Ecopassage) Required
Township of King	23.90 and 23.93	TRCA	Tributary of East Humber River	Y	N	N	These two culverts provide a link along the East Humber River valley corridor with connections to the provincially significant King-Vaughan Wetland Complex.	A tributary of the East Humber River flows through the culvert at Mile 23.90. This culvert provides very limited wildlife passage; however, the culvert at Mile 23.93 is located in close proximity. It is a recently constructed pedestrian underpass that doubles as a culvert. Suitable passage for small and mid-sized mammals and some land-based reptiles and amphibians is present at this location.	No
	24.80	TRCA	East Humber River	Y	Y	N	Provides a link along the main East Humber River corridor.	Existing culvert is undersized. Passage for small and mid-sized mammals, reptiles and amphibians may be limited.	Yes
Town of Newmarket	31.50	LSRCA	Tannery Creek	Y	N	Y	Creek corridor links the provincially significant Aurora McKenzie Wetland Complex to the west and the habitats found within the St. Andrews Valley Golf Club.	Limited connection provided by the existing culvert.	Yes
	32.00	LSRCA	Tannery Creek (Clubinis Creek)	Y	N	Y	Links unevaluated wetlands with the habitats found within the St. Andrews Valley Golf Club and beyond.	Existing bridge is hydraulically deficient. Passage for small and mid-sized mammals, reptiles and amphibians may be limited.	Yes
	32.20	LSRCA	Tributary of East Holland River	Y	N	Y	Links unevaluated wetlands on the west and east side of the rail corridor.	Existing stone bridge provides sufficient space for passage of large mammals and turtles. Passage for small and mid-sized mammals, reptiles and amphibians may be limited.	No
Town of East Gwillimbury	37.40	LSRCA	Tributary of East Holland River	Y	N	Y	Provides a link between Significant Woodlands and unevaluated wetlands and the East Branch of the Holland River.	Two existing culverts (CSP and concrete pipe). Passage for small and mid-sized mammals, reptiles and amphibians is limited.	Yes
Township of King/Town of Bradford West Gwillimbury	41.00	LSRCA	West Holland River	N	N	N	The West Holland River provides an important migratory route for aquatic and semi-aquatic species.	West Holland River bridge. Sufficient passage opportunities exist for aquatic species and for small and mid-sized mammals, reptiles and amphibians.	No
Town of Bradford West Gwillimbury	42.60	LSRCA	Tributary of the West Holland River	N	N	N	Provides a linkage between unevaluated wetlands to the west and the provincially significant Holland Marsh Wetland Complex to the east.	Existing concrete culvert is undersized. Passage for small and mid-sized mammals, reptiles and amphibians may be limited.	Yes
	44.15	LSRCA	Scanlon Creek	Y	N	N	Important connection between the Scanlon Creek Conservation Area and wetlands to the west.	Existing stone and concrete bridge conveys large quantity of water. Passage for turtles possible.	No
Town of Innisfil	47.89	LSRCA	Upper Marsh Creek	N	N	N	Links provincially significant Holland Marsh Wetland Complex with wetland and woodland to the west.	Limited passage available for small and mid-sized mammals, reptiles and amphibians	Yes
	49.20	LSRCA	White Birch Creek	N	N	N	Links the Luck Conservation Area to the west with wetlands to the east. Some disturbance is present on the east side.	Box culvert is present. Passage available for reptiles and amphibians.	No
	50.86	LSRCA	Wilson Creek	N	N	N	Links two wetlands within the provincially significant Wilson Creek Marsh Wetland Complex. Significant Amphibian Breeding Habitat (wetland) was found on the east side of the ROW. Some amphibians may use this crossing as a movement corridor.	Existing culvert provides minimal passage for small and mid-sized mammals, reptiles and amphibians.	Yes
	53.28	LSRCA	Belle Aire Creek	N	N	N	Links Little Cedar Point PSW with larger wooded corridor to the west.	Passage for small and mid-sized mammals, reptiles and amphibians may be limited.	Yes
City of Barrie	61.20	LSRCA	Lovers Creek (Tollendale Creek)	Y	N	N	Important passage along the Lovers Creek natural corridor in an urban setting.	Existing bridge spans Cox Mill Road and the creek, allowing sufficient crossing opportunity for aquatic and terrestrial species.	No

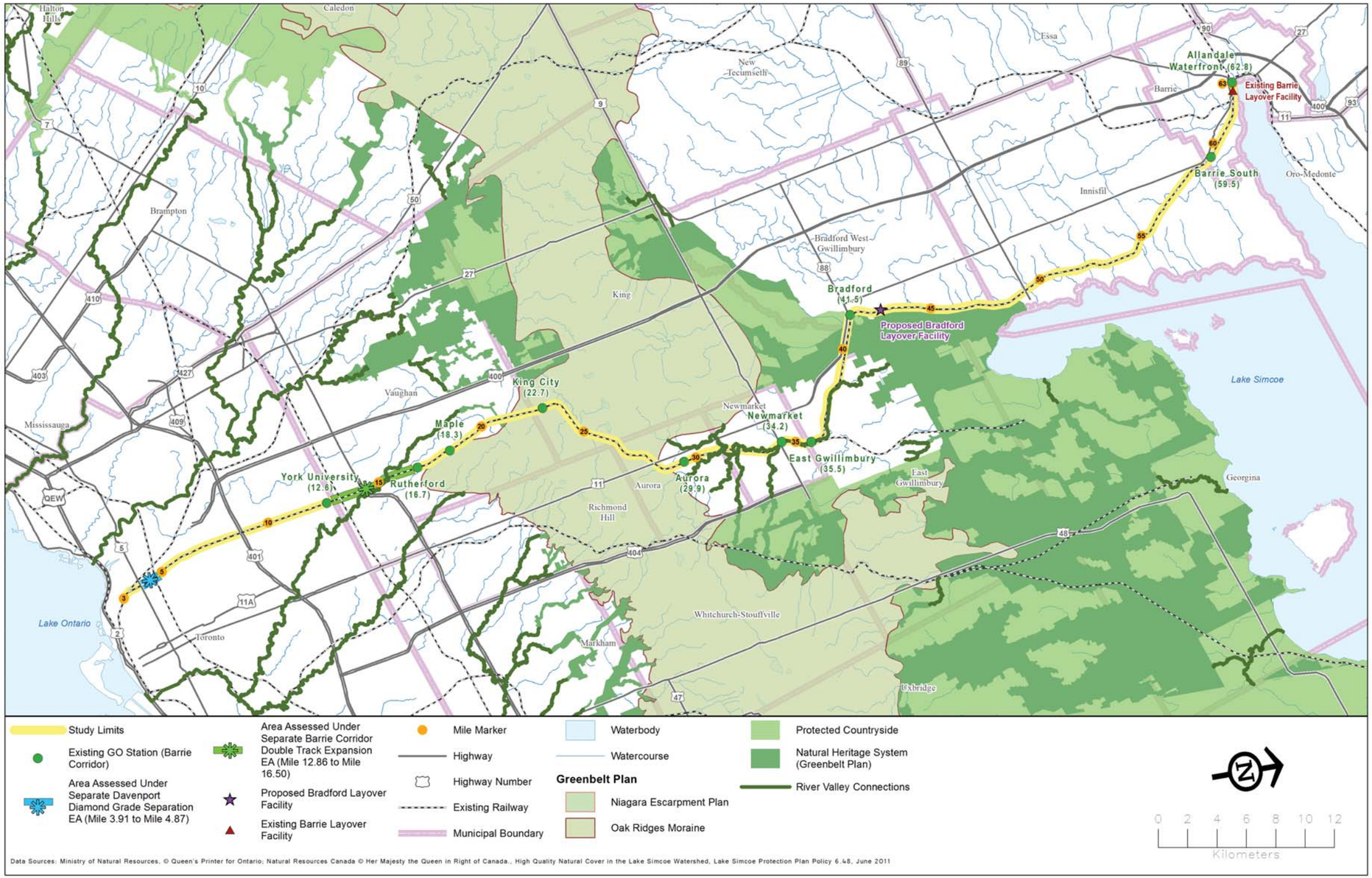

Figure 3-4: Greenbelt Plan – Natural Heritage System

3.1.6 Archaeological Resources

3.1.6.1 Stage 1 Archaeological Assessment

Archaeological Services Inc. (ASI) conducted a Stage 1 Archaeological Assessment for the BRCE Project, which involved a review of background documents and archaeological records, property inspection, and analysis to identify areas of archaeological potential. Background research conducted by ASI demonstrates that the study area has been occupied by Aboriginal peoples for thousands of years and is located on the territory of the ancestral Huron-Wendat. It was subsequently utilized by the Seneca and Ojibwa peoples for hunting territories, until a series of land treaties were signed and became legally binding agreements during the nineteenth-century. The background research also acknowledges the presence of the Métis across Ontario; however, their presence is often muted in the historical record.

The property inspection associated with this Stage 1 Archaeological Assessment determined that the majority of the study area has been previously disturbed by construction of the existing Barrie rail ROW and adjacent development. However, notwithstanding this disturbance, significant sections of the study area were found to retain archaeological potential and will require further archaeological assessment. In summary, the Stage 1 Archaeological Assessment identified potential archaeological resources as follows:

Phase One (Mile 3.00 to 29.90):

- Zones of archaeological potential are identified within the study area on both sides of the rail corridor (see Figures 32 to 53 provided in the Stage 1 Archaeological Assessment which is within Appendix C of this EPR);
- Sensitive cultural features include a potential cemetery associated with St. Helen's Historic Church (see Figure 32 provided in the Stage 1 Archaeological Assessment in Appendix C of this EPR); and
- Two known cemeteries adjacent to the corridor: Mt. Sinai Memorial Park (Mile 9.30) and Maple United Church Cemetery (Mile 18.18)[16].

Future Phase(s) (Mile 29.90 to 63.00):

- Zones of archaeological potential are identified within the study area on both sides of the Barrie rail corridor (see Figures 53 to 80 provided in the Stage 1 Archaeological Assessment in Appendix C of this EPR); and
- Sensitive cultural features include a potential cemetery associated with the LeFroy United Church and the known St. Paul's Cemetery (see Figures 71 and 77 provided in the Stage 1 Archaeological Assessment in Appendix C of this EPR).

In addition, the Hope site (AlGv-199) is a documented ancestral Huron-Wendat village site that is located more than 500 metres away from the study area[17]. While an ossuary[18] has not been definitively identified for this site, there could be one in its immediate or general vicinity. The Ossuary Potential Model was applied to the Hope site within the context of the BRCE Project study area. This model identifies lands within one km of the village site as well as within 300 metres of water as bearing potential for the location of an ossuary (ASI 2013a; 2013b). When applied to the study area, the model identifies lands having potential for the location of an ossuary.

3.1.7 Cultural Heritage Resources

3.1.7.1 Cultural Heritage Screening

ASI prepared a Cultural Heritage Screening Report (CHSR), provided in Appendix D of this EPR, which generally involved a review and analysis of background research and documentation to screen Cultural Heritage Resources[19] (CHR) in accordance with the following legislation and their supporting guidelines:

- O. Reg. 231/08 – Transit Projects and Metrolinx Undertakings (Transit Projects Regulation) under the EAA, 1990;
- Ontario Heritage Act (OHA), 2005; and
- *Planning Act* (1990) and PPS (2014).

Metrolinx undertakings have the potential to impact CHRs by interventions with historic railway corridors and train stations, some of which have the potential to be of provincial significance. Metrolinx undertakings also have the potential to impact locally-significant CHRs where property acquisitions and/or substantial land clearance activities are required. In response to this, Metrolinx developed an internal heritage methodology to address potential impacts to CHRs.

The Metrolinx Interim Cultural Heritage Management Process (2013) involves four steps:

- Step 1: Cultural Heritage Screening (e.g., preparation of a CHSR);
- Step 2: Cultural Heritage Evaluation (e.g., preparation of a Cultural Heritage Evaluation Report (CHER));
- Step 3: Interim Cultural Heritage Management; and
- Step 4: Review and Approval for Metrolinx Heritage Properties of Provincial Significance.

Metrolinx has also established a heritage committee, which includes independent third party heritage experts based on the Ministry of Tourism Culture and Sport (MTCS) Standards and Guidelines for the Conservation of Provincial Heritage Properties (2010) to administer this process and ensure that decisions affecting Cultural

[16] *Not specifically named in the Stage 1 Archaeological Assessment but have been included as mitigation may apply, as described in Section 4.3.3.2 of this EPR.*
[17] *Due to the sensitivity of this feature, its location is not presented in this Report.*
[18] *An ossuary is defined as a burial event where the secondary remains of multiple individuals were re-interred in a generally mixed deposit. It is assumed that such features were normally formed during a single ceremonial event, triggered by occurrences such as village relocation, the death of a leader, or the reformulation of inter-village alliances. Village relocations, for instance, are thought to have occurred every eight to 12 years among the Huron of Simcoe County, as local resources became increasingly degraded or scarce (Tooker 1964; Trigger 1969; Heidenreich 1971). Among the pre-contact Iroquoians of southern Ontario however, such settlement shifts are thought to have been less frequent, occurring approximately every fifteen to 30 years (e.g., Warrick 1990). The rate of village relocation, a factor directly related to both the local environmental setting and population densities, and arguably the most predictable variable, may have significant implications for the number of ossuary sites that may be expected to exist within a given region (ASI 2010a).*
[19] *The term CHR is used to describe both built heritage resources and cultural heritage landscapes. A cultural landscape is a collection of individual built heritage resources and other related features that together form farm complexes, roadscapes and clustered settlements. Built heritage resources are typically individual buildings or structures that may be associated with a variety of human activities, such as historical settlement and patterns of architectural development.*

Heritage are made in a transparent, accountable, and responsible way. The CHSR (Appendix D of this EPR) fulfills Step 1 of the above process. ASI organized CHRs based on three possible screening outcomes:

- Potential Provincial Heritage Property (Potential PHP), where the property is owned or occupied by Metrolinx, and the answer to at least one screening question 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 study area; or
- Non-heritage Property, where the property does not meet any of the screening criteria.

Upon completion of the screening, ASI identified the following CHRs within the portion of the study area associated with the new rail infrastructure:

- 20 Potential PHPs;
- 33 CHPs, including the following known resources with previous heritage recognition:
  - Former St. Clair Avenue Train Station, Listed, City of Toronto (Mile 5.31);
  - Downsview Park and Airport, Listed, City of Toronto and the Federal Heritage Buildings Review Office (FHBRO) (Mile 10.00);
  - Vaughan City Hall, Listed, City of Vaughan (Mile 17.96 - 18.02);
  - Farmscape-1, Listed, City of Vaughan (Mile 20.32);
  - Golf Range, Listed, City of Vaughan (Mile 20.76);
  - Farmscape-2, Property of interest by municipality, City of Vaughan (Mile 20.84);
  - Farmscape-5, Listed, City of Vaughan (Mile 21.63);
  - The Country Day School, Listed, Township of King (Mile 25.11);
  - Sawyer/Cortelucci House, Designated, Part IV OHA (Mile 53.90); and
  - Farmscape-18, Formerly Listed, Town of Innisfil (Mile 58.98).
- 7 Adjacent properties, as follows:
  - National Cash Register Company Factory, Designated, Part IV OHA (Mile 3.20);
  - York Beltline Trail (Known PHP, MHC Decision Form, January 28, 2016) (Mile 6.70);
  - Maple Village Heritage Conservation District (HCD), Designated, Part V OHA (Mile 18.10-18.30);
  - Crawford and Maud Wells House, Designated, Part IV OHA (Mile 23.20);
  - Radial Railway Bridge Abutment, Designated, Part IV OHA (Mile 28.60);
  - Thomas Jaffrey Robertson House, Designated, Part IV OHA (Mile 33.90); and
  - Former Newmarket Train Station, Designated, Part IV OHA (Mile 34.35).

The CHSR also included a preliminary review of the heritage attributes of each potential CHR and an initial assessment of effects. The screening resulted in one of four outcomes for the assessed CHRs, as follows:

- Where a property was deemed a Non-heritage Property, it was eliminated from further review;
- Where it was clear that no heritage attributes would be affected, the CHR was also eliminated from further review;
- Where there was likelihood that the heritage attributes could be directly affected, CHERs were completed to further confirm the heritage value of the Potential PHPs and CHPs, as documented in Section 3.1.7.2 and in Appendix E of this EPR; and
- Where there was potential for heritage attributes to be indirectly affected, CHERs were not immediately completed; however, the property was flagged for further assessment during the detailed design phase or prior to Project construction. Further details are provided in Section 4.3.4.

Table 3-21 summarizes the outcome of the screening. As noted therein, 19 PHPs and 3 CHPs were identified through the screening process as potentially being directly affected by the BRCE Project and requiring completion of a CHER.

3.1.7.2 Cultural Heritage Evaluation

Twenty-two CHERs were prepared 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 per the MTCS Standards and Guidelines (2010). In addition, the CHERs were prepared according to the Metrolinx Draft Terms of Reference for Consultants: Cultural Heritage Evaluation Report and Cultural Heritage Evaluation Report Recommendations. CHERs were prepared for select CHRs (19 PHPs and 3 CHPs) which were identified through the screening process as potentially being directly affected by the Project. These CHRs are shown on Figure 3-4 and are further assessed for potential effects in Section 4.3.4 of this Report.

Table 3-21Table 3-22 identifies the properties for which CHERs were completed and the outcome of that process. The CHERs are provided in Appendix E. Of the 19 PHPs which were subject to a CHER, two were found to meet the criteria under O. Reg. 9/06, as follows:

- St. Clair Avenue West Bridge (Mile 5.24); and
- Stone Box Culvert – 1 (Mile 20.86).

Of the 3 CHPs which were subject to a CHER, none were found to meet the criteria under O. Reg. 9/06. No properties met the criteria under O. Reg. 10/06. Table 3-21 also provides the results of relevant CHERs which were completed under other Metrolinx Projects.

Table 3-21: Summary of Cultural Heritage Screening and Evaluation Outcomes – Rail Infrastructure

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Cultural Heritage Screening Report Outcome	Cultural Heritage Evaluation Report Outcome[1,2]
City of Toronto						
TO-01	3.12	Lansdowne Avenue Bridge	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
TO-02	3.20	National Cash Register Company Factory	222 Lansdowne Avenue	Part IV Designation, OHA (By-law 436-2003)	Adjacent.	CHER not completed to date.
TO-03	3.37	Dundas Street Bridge	N/A	None	CHP.	Non-heritage property. CHER completed as part of the GO Rail Network Electrification TPAP (MHC Decision Form, September 23, 2016).
N/A	3.91	Bloor Street West Subway Bridge	N/A	None	Non-heritage property..	Non-heritage property. CHER previously completed as part of the Davenport Community Rail Overpass TPAP (MHC Decision Form, March 29, 2016).
N/A	4.87	Davenport Road Subway Bridge	N/A	None	Non-heritage property.	Non-heritage property. CHER previously completed as part of the Davenport Community Rail Overpass TPAP (MHC Decision Form, March 29, 2016).
N/A	4.88	Industrial Property - 1	1800 Davenport Road	None	Non-heritage property. Previously screened as part of the Davenport Community Rail Overpass CHSR (Taylor Hazell Architects 2015.)	CHER not required.
N/A	4.90	Industrial Property - 2	48-50 Caledonia Park Road	None	Non-heritage property. Previously screened as part of the Davenport Community Rail Overpass CHSR (Taylor Hazell Architects 2015).	CHER not required.
TO-04	5.24	St. Clair Avenue West Bridge	N/A	None	Potential PHP.	PHP CHER completed for BRCE. Meets criteria in O.Reg. 9/06.
TO-05	5.31	Former St. Clair Avenue Train Station	1550 St. Clair Avenue West	Listed, City of Toronto	CHP.	CHER not completed to date.
TO-06	5.56	Innes Avenue Bridge	N/A	None	CHP.	Non-heritage property. CHER completed as part of the GO Rail Network Electrification TPAP (MHC Decision Form, August 15, 2016).

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Cultural Heritage Screening Report Outcome	Cultural Heritage Evaluation Report Outcome[1,2]
TO-07	5.86	Rogers Road Bridge	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
N/A	6.12	Dunraven Road Tunnel	N/A	None	Non-heritage property.	CHER not required.
N/A	6.50	Eglinton Avenue West Bridge	N/A	None	Non-heritage property.	Non-heritage property. CHER previously completed as part of the Caledonia GO Station TPAP (MHC Decision Form, January 28, 2016).
TO-08	6.70	York Beltline Trail	N/A	PHP (MHC Decision Form, January 28, 2016)	Adjacent	CHER previously completed as part of the Caledonia GO Station TPAP (MHC Decision Form, January 28, 2016).
N/A	7.81	Lawrence Avenue West Bridge	N/A	None	Non-heritage property.	CHER not required.
N/A	8.80	Highway 401 Bridge	N/A	None	Non-heritage property.	CHER not required.
N/A	9.12	Wilson Avenue Bridge	N/A	None	Non-heritage property.	CHER not required.
TO-09 and TO-10	10.00	Downsview Park and Airport	35 Carl Hall Road and (No Municipal No.) Wilson Heights	Listed, City of Toronto; and FHBRO	CHP.	CHER not completed to date.
TO-11	10.97	Sheppard Avenue West Bridge	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
TO-12	10.95	Residence - 1	37 Bakersfield Street (includes 19 Bakersfield Street)	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
N/A	11.65	Finch Avenue West Bridge	N/A	None	Non-heritage property.	CHER not required.
N/A	12.92	Steeles Avenue West Bridge	N/A	None	Non-heritage property.	CHER not required.
City of Vaughan						
N/A	13.25	York Sub Rail Bridge	N/A	None	Non-heritage property.	CHER not required.
N/A	13.81	Highway 407 Bridge	N/A	None	Non-heritage property.	CHER not required.
VA-04	17.96 to 18.02	Vaughan City Hall	2141 Major Mackenzie Drive	Listed, City of Vaughan	CHP.	CHER not completed to date.
N/A	18.10	Major Mackenzie Drive Bridge	N/A	None	Non-heritage property.	CHER not required.
N/A	18.10-18.30	Maple Village HCD	N/A	Designated Part V OHA (By-law 167-2007)	Adjacent	CHER not completed to date.
N/A	19.60	Keele Street Bridge (1)	N/A	None	Non-heritage property.	CHER not required.

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Cultural Heritage Screening Report Outcome	Cultural Heritage Evaluation Report Outcome[1,2]
VA-07	20.32	Farmscape – 1	11390 Keele Street	Listed, City of Vaughan	CHP.	CHER not completed to date.
VA-08	20.76	Golf Range	2480 Kirby Road	Listed, City of Vaughan	CHP.	CHER not completed to date.
VA-09	20.84	Farmscape – 2	11730 Keele Street	Property of interest by municipality	CHP.	CHER not completed to date.
VA-10	20.86	Stone Box Culvert - 1	N/A	None	Potential PHP.	PHP. CHER completed for BRCE. Meets criteria in O.Reg. 9/06.
VA-11	21.26	Farmscape – 3	11874 Keele Street	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
VA-12	21.50	Farmscape – 4	No address (PIN 33440218)	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
VA-13	21.63	Farmscape – 5	12024 Keele Street	Listed, City of Vaughan	CHP.	CHER not completed to date.
Township of King						
KI-01	23.20	Crawford and Maud Wells House	12974 Keele Street	Designated, Part IV, OHA (By-law 2009-73)	Adjacent.	CHER not completed to date.
N/A	23.28	King Road Bridge	N/A	None	Non-heritage property.	CHER not required.
N/A	23.30	Keele Street Bridge (2)	N/A	None	Non-heritage property.	CHER not required.
KI-02	23.93	Stone Box Culvert - 2	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
KI-03	24.80	Farmscape - 6	13275 Dufferin Street	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
KI-04	24.98	Stone Box Culvert - 3	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
KI-05	25.11	Country Day School	13415/13435 Dufferin Street	Listed, Township of King	CHP.	CHER not completed to date.
KI-06	25.48	Farmscape - 7	13519 Dufferin Street	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
KI-07	25.79	Farmscape - 8	1315 15th Sideroad	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
Town of Aurora						
N/A	26.50	Bathurst Street Bridge	N/A	None	Non-heritage property.	CHER not required.

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Cultural Heritage Screening Report Outcome	Cultural Heritage Evaluation Report Outcome[1,2]
AU-01	28.10	Stone Box Culvert - 4	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
AU-02	28.50	Yonge Street Bridge	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
AU-03	28.60	Radial Railway Bridge Abutment	520 Industrial Parkway South	Designated, Part IV OHA (By-law 4850-06.R)	Adjacent.	CHER not completed to date.
Town of Newmarket						
NE-01	31.50	Stone Box Culvert - 6	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
NE-02	32.00	Clubinis Creek Bridge	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
NE-03	32.20	Stone Box Culvert - 5	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
NE-04	33.70	Holland River Bridge	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
NE-05	33.90	Thomas Jaffrey Robertson House	115-117 Main Street South	Designated, Part IV OHA (By-law 1988-143)	Adjacent.	CHER not completed to date.
N/A	33.95	Queen Street Bridge	N/A	None	Non-heritage property.	CHER not required.
NE-06	34.30	Former Newmarket Train Station	450/474 Davis Drive	Designated, Part IV OHA (By-law 1987-110)	Adjacent.	CHER not completed to date.
NE-15	34.74	Residence - 9	281 Main Street North	None	CHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
NE-16	35.05	Residence - 10	315 Main Street North	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
Town of East Gwillimbury						
EG-01	35.92	Residence - 11	29 Rogers Road	None	CHP. No further review required as part of the BRCE Project.	CHER not required.

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Cultural Heritage Screening Report Outcome	Cultural Heritage Evaluation Report Outcome[1,2]
EG-02	38.41	Residence - 12	60 Bradford Street	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
Town of Bradford West Gwillimbury						
BR-01	41.00	Holland River Bridge (2)	N/A	None	Potential PHP.	Non-heritage property. CHER completed as part of the GO Rail Network Electrification TPAP (MHC Decision Form, August 15, 2016).
BR-03	44.15	Scanlon Creek Culvert	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
Br-04	44.44	Farmscape - 9	2108 Line 10	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
BR-05	44.93	Farmscape - 10	2047 Line 11	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
Town of Innisfil						
IN-01	47.79	Farmscape - 11	33 20th Sideroad	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
IN-02	48.29	Farmscape - 12	1350 14th Line	None	CHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
IN-03	50.12	Cast Iron Culvert	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
IN-04	50.22	Farmscape - 13	497 20th Sideroad	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
IN-05	51.58	Residence - 13	871 Front Street	None	CHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
IN-06	51.96	Residence - 14	1364 Killarney Beach Road	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
IN-07	52.12	Stone Arch Culvert	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
IN-08	52.89	Farmscape - 14	1346 Belle Aire Beach Road	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
N/A	53.70	6th Line Bridge	N/A	None	Non-heritage property.	CHER not required.

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Cultural Heritage Screening Report Outcome	Cultural Heritage Evaluation Report Outcome[1,2]
IN-09	53.90	Sawyer/ Cortelucci House	1350 6th Line	Designated, Part IV OHA (By-law 037-11)	CHP.	CHER not completed to date.
IN-10	53.95	Stone Box Culvert - 7	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
IN-11	54.20	Farmscape - 15	1363 7th Line	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
IN-12	56.74	Farmscape - 16	1872 9th Line	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
IN-13	58.61	Farmscape - 17	2114 Lockhart Road	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
City of Barrie						
BA-01	58.98	Farmscape - 18	793 Mapleview Drive	Formerly Listed, Town of Innisfil	CHP. No further review required as part of the BRCE Project.	CHER not required.
N/A	60.30	Big Bay Point Road Bridge	N/A	None	Non-heritage property.	CHER not required.
BA-02	61.14	Cox Mill Road Bridge	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.
BA-03	61.20	Tollendale (Lovers Creek) Bridge	N/A	None	Potential PHP.	Non-heritage property. CHER completed for BRCE. Does not meet criteria 9/06 or 10/06.

[1] Several CHERs were completed as part of the GO Rail Network Electrification TPAP or other Metrolinx Projects. The outcomes of these are included where they relate to potential CHRs in the BRCE study area.
[2] The outcome presented reflects the decision of the Metrolinx Heritage Committee.

Table 3-21 indicates that the following CHRs are present within the study area and have the potential to be impacted by the BRCE:

PHPs:

- St. Clair Avenue West Bridge (Mile 5.24); and
- Stone Box Culvert – 1 (Mile 20.86).
- 10 CHPs with previous heritage recognition, as follows:
  - Former St. Clair Avenue Train Station, Listed, City of Toronto (Mile 5.31);
  - Downsview Park and Airport, Listed, City of Toronto and the FHBRO (Mile 10.00);
  - Vaughan City Hall, Listed, City of Vaughan (Mile 17.96-18.02);
  - Farmscape-1, Listed, City of Vaughan (Mile 20.32);
  - Golf Range, Listed, City of Vaughan (Mile 20.76);
  - Farmscape-2, Property of interest by municipality, City of Vaughan (Mile 20.84);
  - Farmscape-5, Listed, City of Vaughan (Mile 21.63);
  - The Country Day School, Listed, Township of King (Mile 25.11);
  - Sawyer/Cortelucci House, Designated Part IV OHA (Mile 53.90); and
  - Farmscape-18, Formerly Listed, Town of Innisfil (Mile 58.98).
- 7 Adjacent properties, as follows:
  - National Cash Register Company Factory, Designated, Part IV OHA (Mile 3.20);
  - York Beltline Trail (Known PHP, MHC Decision Form, January 28, 2016) (Mile 6.70);
  - Maple Village Heritage Conservation District (HCD), Designated Part V OHA (Mile 18.10-18.30);
  - Crawford and Maud Wells House, Designated Part IV OHA (Mile 23.20);
  - Radial Railway Bridge Abutment, Designated Part IV OHA (Mile 28.60);
  - Thomas Jaffrey Robertson House, Designated, Part IV OHA (Mile 33.90); and
  - Former Newmarket Train Station, Designated, Part IV OHA (Mile 34.35).

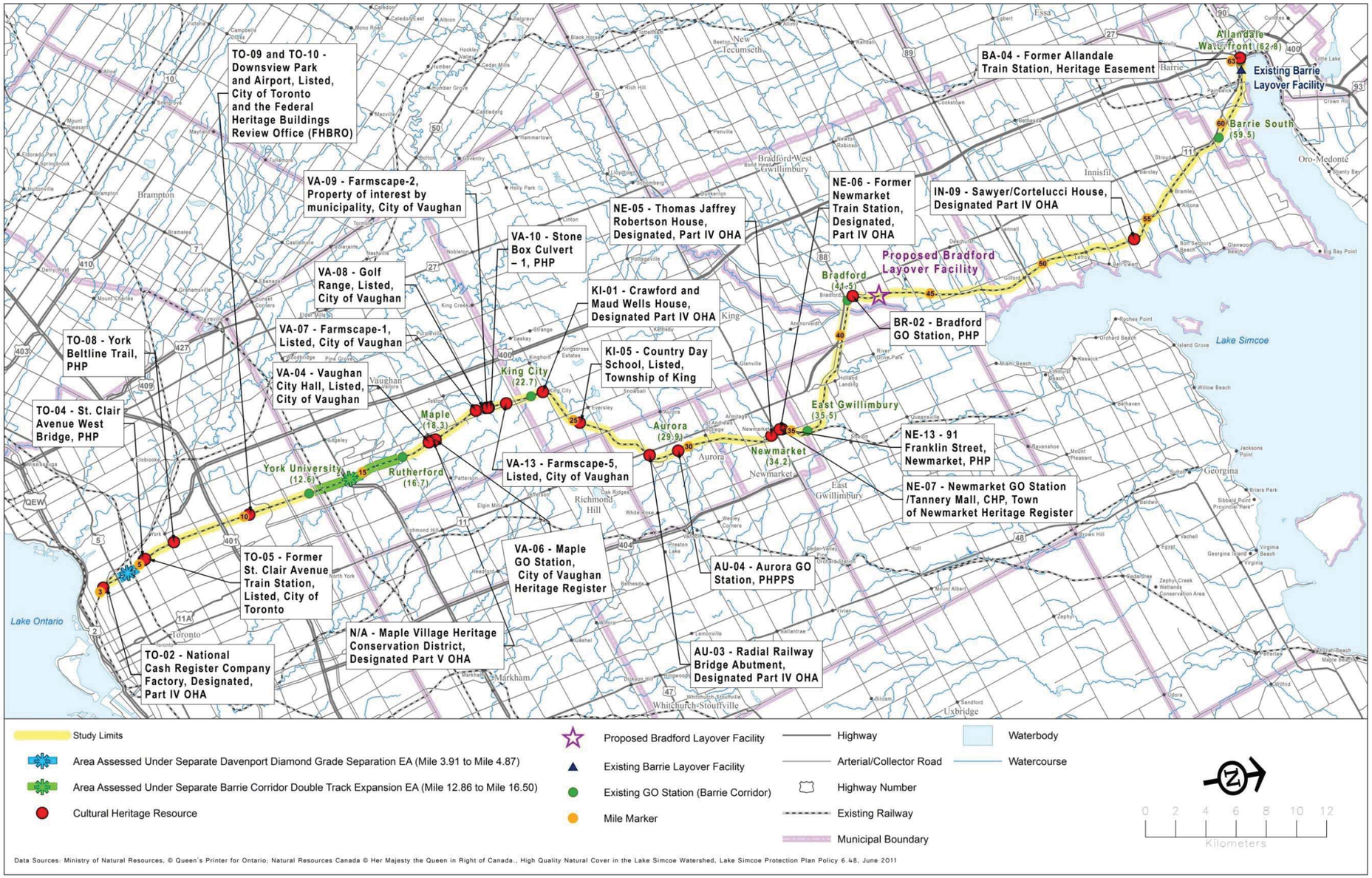

Figure 3-5: Cultural Heritage Resources in the Study Area

3.1.8 Socio-Economic Environment and Land Use

Statistics were compiled in order to describe the current and future social and economic context which will influence the use of the rail service as well as land use and growth in the vicinity of the Barrie rail corridor. Statistics were not specifically available for the study area. As such, demographics, social and economic conditions are broadly generalized based on information available for single-tier and upper-tier municipalities along the Barrie rail corridor. Given the generalized nature of this section, data for lower-tier municipalities would not significantly add to the broad contextual understanding of the area and has, therefore, been combined with upper-tier municipal statistics. Additional details regarding the socio-economic environment can be found within the Socio-Economic and Land Use Characteristics Report provided in Appendix F of this EPR.

3.1.8.1 Current Population

Recent population data for each single-tier and upper-tier municipality along the Barrie rail corridor from the 2006 and 2011 census are provided in Table 3-22. As noted therein, the population growth over this period is also summarized and compared to the Province of Ontario as a whole. With the exception of the City of Toronto (which was slightly lower), all upper-tier communities grew at, or above, the provincial average growth rate. It is noted that York Region experienced a notably high population increase of 15.7%.

Table 3-22: Population Change in Communities Along the Barrie Rail Corridor Over the 2006 to 2011 Period[1]

Geographic Area	2006 Population	2011 Population	% Change (2006 to 2011)
Province of Ontario	12,160,282	12,851,821	5.7
City of Toronto	2,503,281	2,615,060	4.5
York Region	892,712	1,032,524	15.7
Simcoe County [2]	422,204	446,063	5.7
City of Barrie	128,430	136,063 [3]	5.9

[1] Source: Statistics Canada, 2011 Census of Population.
[2] City of Barrie data is also included within County of Simcoe statistics.
[3] 2011 City of Barrie data is from the revised 2011 count.

3.1.8.2 Projected Population Growth

Population forecasts for the upper-tier municipalities were obtained from the Growth Plan for the Greater Golden Horseshoe, 2006, (2013 consolidation). The population of all municipalities are expected to increase significantly in the future as summarized in Table 3-23.

Table 3-23: Projected Future Population[1]

Municipality	Year (Population in the 000's)[2]				% Change (2011 to 2041)
	2011	2031	2036	2041	
City of Toronto	2,760	3,190	3,300	3,400	18.82%
York Region	1,060	1,590	1,700	1,790	40.78%
County of Simcoe	294	N/A	456	497	40.85%
City of Barrie	157	210	231	253	37.94%

[1] Source: Amendment 2 to the Growth Plan for the Greater Golden Horseshoe, 2006, 2013 consolidation.
[2] 2011 population data was obtained from the Growth Plan for the Greater Golden Horseshoe, 2006, January 2012 consolidation as data for this year is not provided in the later 2013 consolidation; Numbers rounded off to the nearest 10,000 for GTHA municipalities, GTHA Total and Outer Ring Total and to the nearest 1,000 for outer ring municipalities; City of Barrie data obtained from Schedule 7.
N/A= not available.

3.1.8.3 Secondary Plan and Other Growth Areas

As noted above, communities along the Barrie rail corridor within the study limits have growth targets provided within the Growth Plan (2013 consolidation). In order to meet targets, land use changes and intensification are expected in a number of locations along the Barrie rail corridor within the study limits. There are several areas directly adjacent, or in close proximity to, the rail corridor which are the subject of Secondary Plans[20]. These areas are specifically identified for new growth and development and are expected to provide a significant number of new homes and an increased population. Secondary Plan and Growth Areas along the corridor are summarized in Table 3-24 and are shown in Figure 3-6. These areas are within walking distance or within easy transit access such that new residents could reasonably make use of the expanded rail service.

Table 3-24: Growth Projected in Proximity to the Rail Corridor[1]

Area ID	Growth Area	Number of Projected New Residential Units	Number of Projected New Residents
City of Toronto			
GA1	Dufferin Street Secondary Plan Area	5,850	11,414
GA2	Lawrence Allen Secondary Plan Area	5,000	9,500
GA3	Dufferin-Wilson Regeneration Study Area	700	1,330
GA4	Tippett Road Regeneration Study Area	4,000 to 4,300	7,600 to 8,170
GA5	Downsview Secondary Plan Area	10,000	19,000

[20] Secondary Plans provide specific policies for areas within a community which may require more detailed direction and guidelines than that provided in an OP. A Secondary Plan is typically adopted as an amendment to the OP.

Growth Area ID	Growth Area	Number of Projected New Residential Units	Number of Projected New Residents
City of Vaughan			
GA6	Rutherford GO Station	330	670
GA7	Carrville Secondary Plan/Block 18[2]	N/A	N/A
GA8	Maple GO Station Secondary Plan	1018	N/A
GA9	Block 27	N/A	19,000 to 26,700[3]
GA10	Block 28	N/A	N/A[4]
Tonwship of King			
GA11	King City Community Plan	N/A	N/A
Town of Aurora			
GA12	Yonge Street South Secondary Plan	700	2,200
GA13	Aurora Promenade Secondary Plan and Community Improvement Plan (CIP) Area	N/A	4120
GA14	Bayview Southeast Secondary Plan	900 to a maximum of 1,100 by 2016	N/A
GA15	Bayview Northeast Secondary Plan	N/A	N/A
Town of Newmarket			
GA16	Newmarket Urban Centres Secondary Plan	N/A	200 residents + jobs per hectare (combined) 33,000[5]
Town of East Gwillimbury			
GA17	Draft Green Lane Secondary Plan	N/A	21,000 by 2031 37,969 at full build-out
Town of Bradford West Gwillimbury			
GA18	Artesian Industrial Park CIP Area	None	None
Town of Innisfil			
GA19	Lefroy-Belle Ewart Secondary Plan	N/A	N/A
GA20	Alcona Expansion Area	N/A	10,000[6]
GA21	Alcona Future Urban Areas	N/A	N/A
City of Barrie			
GA22	Hewitt's Secondary Plan	N/A	26,000
GA23	Urban Growth Centre/ Intensification Primary Node Areas	50 to 120 units/ha	N/A

[1] Sources: Andrew Au, City of Toronto Planner, letter correspondence, July 9, 2015. Refer to the Socio-Economic and Land Use Characteristics Report provided in Appendix F of this EPR.
Where and How to Grow, Directions on future growth in the City of Vaughan to 2031 (Urban Strategies Inc. 2009).
Maple GO Station Secondary Plan (Official Plan Amendment (OPA#1)) (City of Vaughan, 2014)
Draft Newmarket Urban Centres Secondary Plan (Town of Newmarket, 2014)
Draft Green Lane Secondary Plan (East Gwillimbury, 2014)
Town of Innisfil OPA No. 1. (2009)
Draft Hewitt's Secondary Plan (City of Barrie, 2013)
City of Barrie OP, Schedule I Intensification Areas
[2] Much of the Carrville Secondary Plan Area has been developed with the exception of some commercial and high density residential areas, a community centre and parkland adjacent to the corridor.
[3] Estimate from Emerging Land Use Concept Open House, November, 2015 (City of Vaughan, 2016).
[4] Estimate provided by the City of Vaughan in correspondence relating to the review of draft BRCE Project documents.
[5] Barrie Corridor Planning Study Final Report (Halcrow Consulting Inc. et al., 2012).
[6] The Town of Innisfil OPA No. 1. (2009) notes that the quoted 10,000 new residents is still to be confirmed.

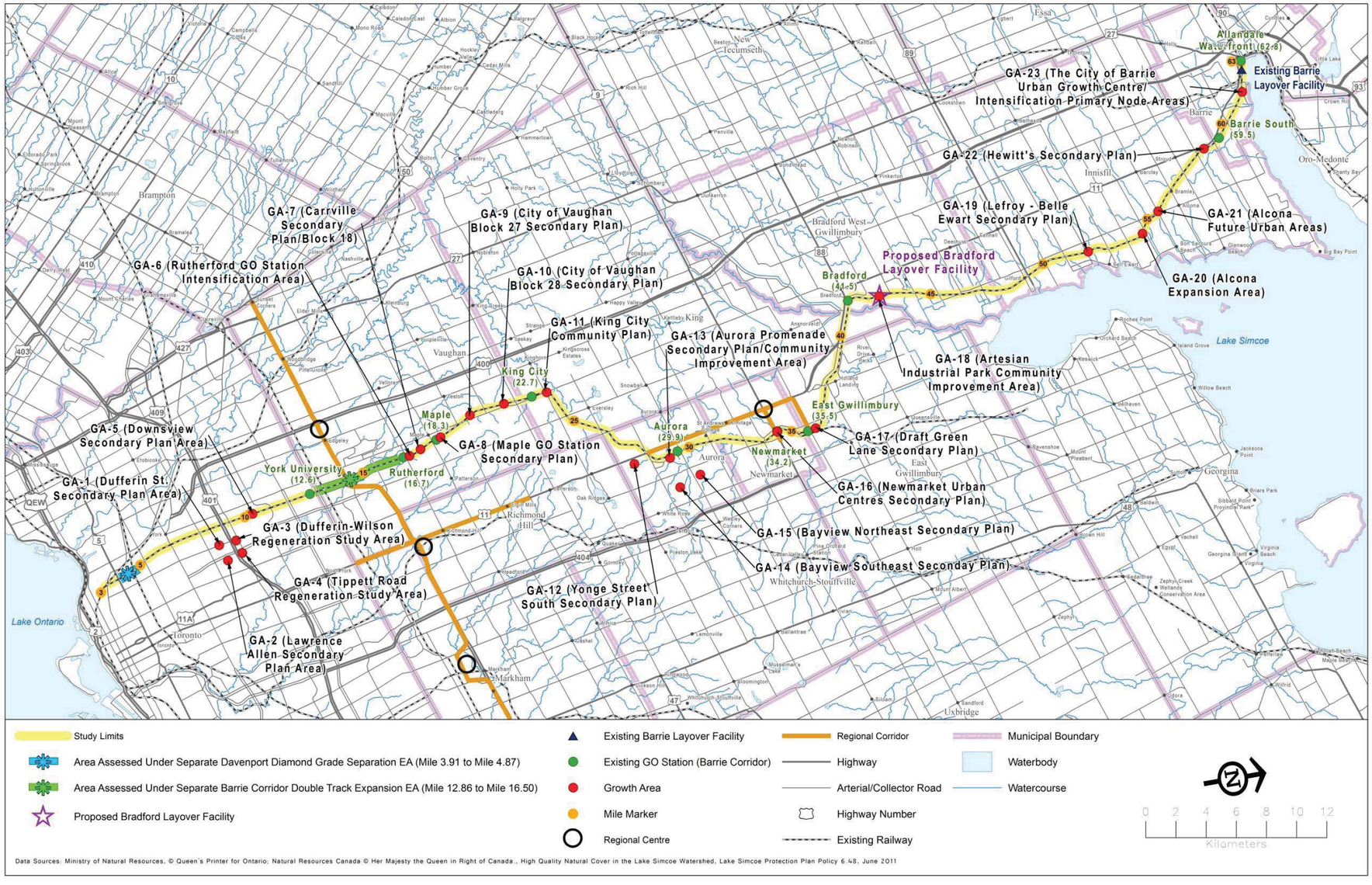

Figure 3-6: Growth Areas

3.1.8.4 *Employment Projections*

Employment targets for the single and upper-tier municipalities are shown in Table 3-25 for the years 2011, 2031, 2036, and 2041, as indicated in the Growth Plan (2013 consolidation). All areas are forecasted to grow substantially, providing the incentive for their economic development initiatives and the need for supporting infrastructure.

Table 3-25: Employment Targets for Study Area Municipalities[1]

Municipality	Employment (Positions in 000s)[2]				Projected % Change (2011 to 2041)
	2011	2031	2036	2041	
City of Toronto	1,540	1,660	1,680	1,720	10.47%
York Region	590	790	840	900	34.44%
County of Simcoe	102	N/A	141	152	32.89%
City of Barrie	77	101	114	129	40.31%

[1] Source: Amendment 2 to the Growth Plan for the Greater Golden Horseshoe, 2006, Office Consolidation, June 2013.

[2] 2011 population data was obtained from the Growth Plan for the Greater Golden Horseshoe, 2006, January 2012 Office Consolidation as data for this year is not provided in the later 2013 consolidation; Numbers rounded off to the nearest 10,000 for GTHA municipalities, GTHA Total and Outer Ring Total and to the nearest 1,000 for outer ring municipalities; N/A = not available from Schedule 3 and Schedule 7; City of Barrie data obtained from Schedule 7; Projected percent change from 2011 to 2041 was calculated by Burnside.

Although employment targets are provided for specific regions; to place these numbers in context, it is also important to consider employment characteristics as they currently exist in Ontario. According to the Ministry of Training, Colleges and Universities (August 2015) and Statistics Canada (October 2015), in August 2015:

- There were 11.4 million people in Ontario aged 15 years or older;
- Close to 7.5 million (or over 65%) were either working or actively looking for work;
- More than 6.9 million were employed, and 82% of them had a full time job; and
- Ontario's unemployment rate was determined to be 6.8%, with 508,000 people unemployed.

3.1.8.5 *Employment Projections for Secondary Plan Growth Areas*

There are several areas along the Barrie rail corridor which are the subject of Secondary Plans. These areas are specifically identified for new growth and development. Once developed, these areas are expected to provide a significant number of new jobs. The number of new employees projected for each area is summarized in Table 3-26. These projections could equate to a large employment base within close proximity to the Barrie rail corridor.

Table 3-26: Number of New Employees Projected in Proximity to the Barrie Rail Corridor[1]

Growth Area ID	Growth Area	Number of Projected Employees
City of Toronto		
GA1	Dufferin Street Secondary Plan Area	716
GA2	Lawrence Allen Secondary Plan Area	200
GA3	Dufferin-Wilson Regeneration Study Area	200 to 230 (draft estimate, not approved)
GA4	Tippett-Wilson Regeneration Study Area	100 to 150 (draft estimate)
GA5	Downsview Secondary Plan Area	22,000
City of Vaughan		
GA6	Rutherford GO Station	Not applicable
GA7	Carrville Secondary Plan/Block 18	N/A (2,601.5m^2 gross commercial floor area approved)
GA8	Maple GO Station Secondary Plan Area	Not applicable
GA9	Block 27	1,500 to 2,150 (estimate from Emerging Land Use Concept Open House, November, 2015)
GA10	Block 28	N/A
Township of King		
GA11	King City Community Plan	N/A
Town of Aurora		
GA12	Yonge Street South Secondary Plan	Not applicable
GA13	Aurora Promenade Secondary Plan and CIP Area	Maintain existing employment levels
GA14	Bayview Southeast Secondary Plan	Not applicable
GA15	Bayview Northeast Secondary Plan	Not applicable
Town of Newmarket		
GA16	Newmarket Urban Centres Secondary Plan	200 jobs + residents per hectare (combined) 18,000 jobs (GO Barrie Planning Study)
Town of East Gwillimbury		
GA17	Draft Green Lane Secondary Plan	70 jobs/ha of developable lands (total plan area=527 ha, therefore 14,229 jobs)
Town of Bradford West Gwillimbury		
GA18	Artesian Industrial Park CIP Area	Not applicable[2]

Growth Area ID	Growth Area	Number of Projected Employees
Town of Innisfil		
GA19	Lefroy-Belle Ewart Secondary Plan	Not applicable
GA20	Alcona Expansion Area	500
GA21	Alcona Future Urban Areas	Not applicable
City of Barrie		
GA22	Hewitt's Secondary Plan	4,160
GA23	Urban Growth Centre/ Intensification Primary Node Areas	5,500

[1] *Sources: Andrew Au, City of Toronto Planner, letter correspondence, July 9, 2015; Where and How to Grow, Directions on future growth in the City of Vaughan to 2031 (Urban Strategies Inc. 2009); Maple GO Station Secondary Plan (City of Vaughan, 2014); Draft Newmarket Urban Centres Secondary Plan (Town of Newmarket, 2014); Draft Green Lane Secondary Plan (East Gwillimbury, 2014); Draft Hewitt's Secondary Plan (City of Barrie, 2013); City of Barrie OP, Schedule I Intensification Areas.*

[2] *Job projections for all Industrial lands in the Town of Bradford West Gwillimbury are expected to total 3,415 new jobs. The proportion of these to be included in the Artesian Industrial Park is not specified.*

3.1.8.6 *Existing Land Use*

Within the study area, 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 study area begins in the City of Toronto which is highly urbanized and includes a variety of residential and employment uses. The Barrie rail corridor bisects Downsview Park which is owned and maintained by the Federal Government and a federal crown corporation. Northward in the City of Vaughan the rail corridor passes through employment and residential areas, and runs adjacent to Vaughan's City Hall. King Township is more rural and is characterized by agricultural lands, rural estate developments and the community. Beyond that, the Towns of Aurora and Newmarket provide a more urban setting with some natural heritage features along the corridor. The Towns of East Gwillimbury and Bradford West Gwillimbury are rural with the exception of the urban area, which comprises the former Town of Bradford. Further to the north, the Town of Innisfil is predominantly rural as well and the corridor terminates in the City of Barrie, which includes a variety of existing urban lands.

Existing land uses were identified within 120 meters from the proposed rail ROW in each municipality and are documented below. Focus was placed on identifying community amenities, services and resources that influence the socio-economic environment.

City of Toronto

The City of Toronto is highly urbanized with densely populated neighbourhoods including a variety of residential, commercial, industrial, park land and school uses. There are four schools present in the study area through the City of Toronto, as well as two daycare facilities, eight places of worship, one cemetery, one private library, 10 parks and three trails and one pedestrian bridge crossing of the Barrie rail corridor. Also of note, are the federally owned and operated properties associated with the former Canadian Forces Base (CFB) Toronto (Downsview) lands which include lands currently owned and operated by the Canada Lands Company Limited (CLCL)[21] and its subsidiary, Parc Downsview Park Incorporated (PDP). A portion of the Stanley Greene neighbourhood of Downsview Park is currently under construction and will include new residential and mixed use properties. Community amenities, services and resources are summarized in Table 3-27. There is one grade-separated pedestrian crossing at Innes Avenue and an off-road trail within the Finch Hydro Corridor and adjacent to the York University busway.

Table 3-27: Community Amenities, Services and Resources in the City of Toronto

Mile Marker (Center)	Distance from Existing Rail ROW (metres)	PIN	Name
Youth Home			
6.27	21.5	104870679	Horizons for Youth - Youth Home and Support
Private Library			
7.85	20.6	102420492	Cham Shan Buddhist Library
Government Office			
9.43	0.0	102330751	Toronto Transportation Services
Schools/Education Facilities			
3.16	111.7	213070308	Shirley St. Jr. Public School/Toronto Shirley St. YMCA
3.54	0.0	213310429	École Secondaire Catholique Saint-Frère-André
5.71	0.0	213200452	St. Nicholas of Bari Separate School
10.36	27.3	Not available	Future Centennial College Aerospace Campus

[21] *Canada Lands Company Limited (CLCL) is an arm's-length, self-financing federal Crown corporation, which reports to the Parliament of Canada through the Minister of Public Services and Procurement (2015 - 2016 Annual Report). It is a Canada Business Corporations Act corporation listed in Schedule III, Part 1 of the Financial Administration Act and is an agent of Her Majesty. The company has three wholly-owned active subsidiaries:*

- *Canada Lands Company Limited, a non-agent Crown corporation, which carries out the company's core real estate business in all regions of Canada.*
- *Old Port of Montréal Corporation Inc., which is responsible for managing the Old Port of Montréal.*
- *Parc Downsview Park Incorporated (PDP, which manages and redevelops the former CFB Toronto lands as Downsview Park and Downsview Lands.*

Mile Marker (Center)	Distance from Existing Rail ROW (metres)	PIN	Name
Pre-Schools/Daycare Facilities			
7.44	45.6	Not available	Educare Preschool Centre - Lotherton
10.36	51.8	Not available	Arpi Nursery School
Places of Worship			
7.20	0.0	103380191	Abundant Life Church of God
7.38	0.0	103380159	Miracle Temple Ministries
7.51	50.4	103380111	The Kingdom of Jesus Christ
7.75	65.3	103380255	Faith House Apostolic Church of Jesus Christ
7.82	0.0	103380225	Maranatha Christian Church
8.68	0.0	102420098	St. Fidelis Church
10.92	0.0	101800088	Downsview 7th Day Adventist Church
11.17	0.0	101780026	Korean Church
Cemetery			
9.30	0.0	102340094	Mt. Sinai Memorial Park
Parks/Recreation Facilities			
3.04	0.0	213060113	West Lodge Park
3.29	0.0	213350035	Sorauran Park
3.60	0.0	213310428	MacGregor Playground
4.90	16.4	213240142	Earlscourt Park
5.27	0.0	213200835	St. Clair Gardens
6.14	0.0	104870685	Bert Robinson Park
6.39	87.7	104870001	Haverson Park
6.51	3.0	104870669	Eglinton Gilbert Parkette
8.44	0.0	102420514	North Park
10.50	0.0	102349501 102339501	Downsview Park
		102339503	
Off-Road Trails/Crossings			
5.65	0.0	Not available	Innes Avenue Pedestrian Crossing/ Grade-separated crossing
6.60	0.0	Not available	York Beltline Trail
11.85	0.0	Not available	Finch Hydro Corridor Recreation Trail/ At-grade crossing

City of Vaughan

Similar to the City of Toronto, the City of Vaughan is highly urbanized with densely populated neighbourhoods and a concentration of commercial and industrial uses to the north of Highway 407. North of Teston Road, the landscape is more rural, characterized by agricultural production.

Notable land uses in Vaughan include: Vaughan City Hall, a YMCA Child Care Centre on the City Hall property and the Maple United Church Cemetery to the north of City Hall. It is noted that plans for a community garden adjacent to City Hall are well underway directly adjacent to the rail corridor. In addition, a former aggregate extraction operation is located adjacent to the Barrie rail corridor between Major Mackenzie Drive and Teston Road. Community amenities, services and resources such as parks and recreation features are summarized in Table 3-28.

Table 3-28: Community Amenities, Services and Resources in the City of Vaughan

Mile Marker (Center)	Distance From Existing Rail ROW (metres)	PIN	Name
Government Office			
17.99	0.0	33404304	Vaughan City Hall
Childcare Facility			
17.99	0.0	33404304	YMCA Child Care Centre
Cemetery			
18.18	20.1	33430270	Maple United Church Cemetery

Mile Marker (Center)	Distance From Existing Rail ROW (metres)	PIN	Name
Farm Crossings			
19.72	0.0	Not available	Private farm crossing
20.03	0.0	Not available	Private farm crossing
20.43	0.0	Not available	Private farm crossing
21.10	0.0	Not available	Private farm crossing
21.49	0.0	Not available	Private farm crossing
21.70	0.0	Not available	Private farm crossing
Other			
18.85	0.0	033430317	Aggregate Extraction Area

Township of King

The Barrie rail corridor passes through the Township of King north of the City of Vaughan and then again as the corridor travels east beyond the Town of East Gwillimbury. The Township of King is primarily rural with agricultural production and open space lands (Photo 3-5), including a number of large natural areas, PSWs and ANSIs. King City is the main urban center in the Township.

Photo 3-5: Township of King Open Space Land Use (Mile 23.88, approximately 175 metres from rail corridor)

The study area through King Township includes three schools, two daycare facilities and the South Simcoe Marina on the east bank of the Holland River. One private farm crossing traverses the rail corridor. Community amenities, services and resources are summarized in Table 3-29.

Table 3-29: Community Amenities, Services and Resources in the Township of King

Mile Marker (Center)	Distance from Existing Rail ROW (metres)	PIN	Name
Marina			
40.82	19.8	34150060	South Simcoe Marina
Schools/Educational Facilities			
23.39	110.6	33720292	King City Montessori School
23.88	0.0	33720365	King City Public School
25.18	0.0	700020017 700020082	The Country Day School
Pre-Schools/Childcare Facilities			
23.39	0.0	33720859	Kidz World Child Care Centre
23.88	0.0	33720365	Le Club Child Care
Farm Crossing			
25.55	0.0	Not available	Private farm crossing

Town of Aurora

The Town of Aurora is highly urbanized (Photo 3-6 and Photo 3-7). Despite the urban nature of the Town, there is a relatively high percentage of open space and recreational lands, including parks and natural areas including the Sheppard's Bush Conservation Area owned by the Ontario Heritage Trust (OHT), and managed by the LSRCA under formal agreement with OHT, with support from the Town of Aurora. The 26 ha (65 acre) property is managed to provide a variety of outdoor educational opportunities, outdoor recreation and natural area protection. It includes over 3 km of hiking trails,13 soccer fields and two buildings: a residential home and an historic house currently being used by the Windfall Ecology Centre.

There are five schools present in the study area as well as one daycare facility, two places of worship, one funeral home, five parks, one conservation area and two on-road bicycle lanes that cross the rail corridor. Details are provided in Table 3-30.

Table 3-30: Community Amenities, Services and Resources in the Town of Aurora

Mile Marker (Center)	Distance From Existing Rail ROW (metres)	PIN	Name
Funeral Home			
28.47	0.0	36440120	Thompson Funeral Home
Schools/Educational Facilities			
26.36	193.0	36700947	École Secondaire Catholique Rennaissance
30.21	239.2	36410855	Aurora Preparatory Academy
30.33	73.4	36400347	École Élémentaire Catholique Saint-Jean
30.40	73.4	36400177	Lester B Pearson Public School
31.14	0.0	36413145	Aurora Montessori School
Childcare Facility			
30.58	138.9	36413103	Aurora Children's Centre
Places of Worship			
28.91	23.6	291470000	RCGC The Redemption House Church Aurora
28.78	41.3	36440043	Aurora Cornerstone Church
Parks/Recreation Facilities			
28.66	0.0	36440079	Highland Park
30.52	82.5	36413101	Aurora Family Leisure Complex and Lambert Wilson Park
30.83	105.1	36412875	Optimist Park/Lambert Wilson Park
30.83	0.0	36410263	Wilson Park
31.45	0.0	36241721	Aurora (McKenzie) Marsh Wetland Complex
Conservation Area			
29.53	20.1	36430635	Sheppard's Bush
On-Road Trails/Crossings			
29.99	0.0	Not available	Wellington Street East/At-grade crossing
31.28	0.0	Not available	St. Johns Sideroad/Grade-separated crossing

Photo 3-6: Town of Aurora Residential Land Use
(Mile 28.35, approximately 30 metres from rail corridor)

Photo 3-7 : Town of Aurora Commercial Land Use
(Mile 28.97, approximately 155 metres from rail corridor)

Town of Newmarket

Similar to the Town of Aurora, the Town of Newmarket is highly urbanized and includes a relatively high proportion of open space and recreational lands within the study area (Photo 3-8Photo 3-4). This is primarily due to the fact that the Barrie rail corridor follows closely along the route of the Holland River which is bounded by floodplains and recreational trails. The Nokiidaa Bike Trail runs adjacent to the Barrie rail corridor through much of the Town of Newmarket and into the Town of East Gwillimbury. The portion of the trail through Newmarket is named the Tom Taylor Trail (part of the Nokiidaa Trail system).

Three conservation areas are also present in the vicinity of the rail corridor. Each is owned and managed by the LSRCA with outdoor education, recreation and flood management purposes. The Nokiidaa/Tom Taylor Trail runs through the Bailey Ecology Park, providing hiking and cycling opportunities in Newmarket. The Wesley Brooks Conservation Area lies in the downtown core and is a significant location for community events. A flood control dam is present to manage waters in the East Holland River. The Mabel Davis Conservation Area lies along the East Holland River and includes additional sections of the Nokiidaa/Tom Taylor Trail and the administrative offices of the LSRCA.

Photo 3-8: Town of Newmarket Open Space Land Use (Mile 34.99, approximately 140 meters from rail corridor)

The study area through the Town of Newmarket also includes two schools, a retirement facility, one place of worship, a York Regional Police Station detachment, one golf course, a tennis club, one recreation center, one senior's meeting place and several other parks and playgrounds. There is an on-road bike lane on Water Street and two crossings associated with the Nokiidaa Bike Trail. All community amenities, services and resources are summarized in Table 3-31 and are shown in the Socio-Economic and Land Use Characteristics Report provided in Appendix F of this EPR.

Table 3-31: Community Amenities, Services and Resources in the Town of Newmarket

Mile Marker (Center)	Distance from Existing Rail ROW (metres)	PIN	Name
Retirement Home			
33.62	141.1	36120016	Chartwell Alexander Muir Retirement Residence
Police Station			
33.56	0.0	36080020	York Regional Police Station
Schools/Educational Facilities			
33.31	127.7	36131091	Pickering College
34.24	0.0	35560770	Everest College of Business Technology
Places of Worship			
33.93	85.3	36090036	Church of the Nazarene
Parks/Recreation Facilities			
32.07	0.0	36240018	Paul Semple Park
32.07	0.0	36241849	St. Andrews Valley Golf Club
33.66	20.2	36080152	Riverwalk Commons
33.75	0.0	36080099	Newmarket Tennis Club
33.87	0.0	36080305	All Our Kids Playpark
39.99	50.8	36090179	Newmarket Youth and Recreation Centre
34.06	0.0	36090082	Newmarket Senior's Meeting Place
35.05	0.0	35560476	MH Stiles Park
Conservation Areas			
32.44	0.0	36240024	Bailey Ecology Park Conservation Area
33.43	0.0	36070226	Wesley Brooks Conservation Area (Fairy Lake)
34.49	43.5	35560787	Mabel Davis Conservation Area
Off-Road Trail/Crossing			
33.55	0.0	Not available	Water Street/At-grade crossing
33.64	0.0	Not available	Nokiidaa/Tom Taylor Bike Trail/At-grade crossing
34.92	0.0	Not available	Pedestrian crossing/access to Nokiidaa/Tom Taylor Bike Trail/At-grade crossing

Town of East Gwillimbury

The Town of East Gwillimbury is characterized by a rural landscape. The Town is currently undergoing significant growth and development, but lands immediately adjacent to the Barrie rail corridor remain relatively undeveloped at this time.

The Rogers Reservoir Conservation Area represents a large natural feature in the Town of East Gwillimbury portion of the study area, and is owned and managed by the LSRCA. The Conservation Area also includes a variety of outdoor recreational opportunities. The Nokiidaa Bike Trail runs through the site with a crossing of the rail corridor in the vicinity of the East Gwillimbury GO Station. The Conservation Area also provides fishing opportunities and includes a concrete lock and swing bridge remnant of a "Ghost" Canal System built and abandoned in the early 1900s without having been used. There are an additional four at-grade crossings of on-road bicycle lanes on Green Lane East, Holland Landing Road, Bradford Street and Oriole Drive. A summary of recreational and trail features are provided in Table 3-32.

Table 3-32: Community Amenities, Services and Resources in the Town of East Gwillimbury

Mile Marker (Center)	Distance from Existing Rail ROW (metres)	PIN	Name
Aeropark			
37.84	37.9	34250157 34250210	Holland Landing Air Park
Conservation Area			
35.61	0.0	34330289 34330287	Rogers Reservoir Conservation Area
On-Road Trails/Crossings			
35.61	0.0	Not available	Green Lane East/At-grade crossing
37.81	0.0	Not available	Holland Landing Road/At-grade crossing
38.43	0.0	Not available	Bradford Street/At-grade crossing
39.33	0.0	Not available	Oriole Drive/At-grade crossing
Off-Road Trail/Crossing			
35.58	0.0	Not available	Access to Nokiidaa Bike Trail/At-grade crossing

Town of Bradford West Gwillimbury

The Town of Bradford West Gwillimbury is primarily rural (Photo 3-9 Photo 3-5) in nature with the exception of the former Town of Bradford, which encompasses the urban center of the Town.

There is a former (closed) landfill located on the outskirts of the Bradford Urban Area (Lot 17-18, Concession 8 Bradford West Gwillimbury), denoted as site # 4162 in the Waste Disposal Site Survey (MOE[22], 1991), and as Site 632 per the Simcoe County OP. The site was closed in 1960, and is a Class A5 landfill, meaning that the waste was municipal/domestic waste from an urban source.

The Town of Bradford West Gwillimbury benefits from the highly productive farm lands associated with the Holland Marsh. A small area of Specialty Crop lands designated in the Greenbelt Plan is located adjacent to the Barrie rail corridor just south of the Bradford GO Station. One private farm crossing traverse the rail corridor in the Town. Other notable features include a daycare centre located adjacent to the Bradford GO Station and the Scanlon Creek Conservation Area. The Conservation Area, owned by the LSRCA, is bisected by the rail corridor. The portion west of the rail ROW includes a variety of outdoor recreation and education facilities, trails, picnic and camping areas. A variety of outdoor educational programs are run for school groups and individuals. The portion east of the ROW is not accessible to the public and is maintained for ecological preservation purposes. Notable features in the Town are summarized in Table 3-33.

Table 3-33: Community Amenities, Services and Resources in the Town of Bradford West Gwillimbury

Mile Marker (Center)	Distance from Existing Rail ROW (metres)	PIN	Name
Childcare Facility			
41.31	142.0	580110568	Creative Carousel Learning & Daycare
Conservation Area			
43.86	0.0	580390030	Scanlon Creek
Specialty Crop Area			
41.20	0.0	Not available	Holland Marsh
Farm Crossing			
44.89	0.0	Not available	Private farm crossing
Other			
42.49	0.0	580410019	Site 632/Site 4162 (closed landfill)

[22] *Since this document was written the Ministry of the Environment (MOE) has changed its name to the Ministry of the Environment and Climate Change (MOECC). The 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 MOE changed its name to the MOECC on June 24, 2014. For the purposes of this EPR the MOE, MOEE and MOECC are considered to be synonymous.*

Photo 3-9: Town of Bradford West Gwillimbury Agricultural Land Use (Mile 44.29, approximately 60 meters from rail corridor)

Town of Innisfil

The Town of Innisfil is rural in nature (Photo 3-10Photo 3-6) with a number of small communities (settlement areas), including Alcona, Stroud and Gilford, which are undergoing significant growth and development (Photo 3-11Photo 3-7). Notable land uses include two community halls, two places of worship, one golf course and four private farm crossings. The Luck Conservation Area, also present, is owned by the LSRCA. The Conservation Area includes a network of hiking trails and is home to the Gilford Arboretum, managed by the Gilford and District Horticultural Society.

A primary aggregate resource is present in a narrow strip that follows the rail corridor in the Lefroy-Belle Ewart Area. According to the Town of Innisfil OP, 2006 (2011 consolidation), the area includes a significant sand and gravel deposit. Much of the resource is covered by the existing rail ROW, residential development and lands protected for future development. As such, access to much of the resource has been eliminated. A summary of community amenities, services and resources is presented in Table 3-34.

Table 3-34: Community Amenities, Services and Resources in the Town of Innisfil

Mile Marker (Center)	Distance from Existing Rail ROW (metres)	PIN	Name
Aggregate Resource			
55.30	0.0	Not available	Primary Aggregate Resource Area
Places of Worship			
51.92	82.9	580650284	Lefroy United Church
55.52	129.2	580640193	Innisfil Community Church
Community Centres			
48.88	0.0	580520203	Gilford Community Hall
51.86	0.0	580650407	South Innisfil Community Centre
Golf Club			
49.75	0.0	580530009	Harbourview Golf and Country Club
Conservation Area			
49.44	0.0	580530008	Luck Conservation Area
Farm Crossings			
48.20	0.0	Not available	Private farm crossing
48.65	0.0	Not available	Private farm crossing
49.88	0.0	Not available	Private farm crossing
58.15	0.0	Not available	Private farm crossing

Photo 3-10: Town of Innisfil Agricultural Land Use (Mile 53.66, approximately 90 meters from rail corridor)

Photo 3-11: Town of Innisfil Residential Land Use (Mile 55.27, approximately 75 meters from rail corridor)

City of Barrie

The City of Barrie, located at the terminus of the Barrie rail corridor, is primarily urban in character with some agricultural lands remaining in its south end (Photo 3-12Photo 3-8). Sensitive and community-based land uses include one cemetery, one place of worship, two schools (on the same property), two retirement/nursing homes, five parks and one private farm crossing. Details are presented in Table 3-35.

Table 3-35: Community Amenities, Services and Resources in the City of Barrie

Mile Marker (Center)	Distance from Existing Rail ROW (metres)	PIN	Name
Long-Term Care/Assisted Living Facility			
61.35	30.0	589020316	Mill Creek Care Centre Long-Term Care Home & Tollendale Village
61.97	146.3	587430263	Serenity Assisted Living
School			
60.05	69.9	580910326	St. Peter's Secondary School/ Saint John Paul II Separate School
Places of Worship			
59.18	89.3	580920069	St. Paul's Anglican Church
Cemetery			
59.18	0.0	580920003	St. Paul's Cemetery
Parks/Recreation Facilities			
60.11	0.0	580910003	Painswick Park
60.48	0.0	589090437	Golden Meadow Park
61.10	0.0	589030006	Lovers Creek Ravine
62.53	29.8	587440216 587440253	Allandale Station Park
62.59	89.8	587440250	South Shore Park
Farm Crossing			
58.94	0.0	Not available	Private farm crossing

Photo 3-12: City of Barrie Agricultural Land Use (Mile 59.18, approximately 70 meters from rail corridor)

3.1.8.7 Planned (Future) Conditions

A comparison of existing and future land uses, as prescribed in applicable OPs, indicates that most land use in the study area 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 Growth Plan provides growth targets for each of the municipalities along the existing Barrie rail corridor (MPIR, 2013 consolidation). In order to meet the specific targets noted within the Growth Plan, land use changes and intensification are expected in a number of locations along the corridor. The planned or anticipated land use changes on lands directly adjacent to the Barrie rail corridor are described in the sections below.

City of Toronto

According to City of Toronto staff, there are several future development applications associated with the Downsview Secondary Plan (Planning Alliance, 2010) (City of Toronto correspondence is provided in the Socio-Economic and Land Use Characteristics Report located within Appendix F of this EPR). As the Barrie rail corridor bisects this area. Development applications noted by the City of Toronto, which were reviewed as part of this study included the:

- Stanley Greene Neighbourhood, which includes 1,356 residential units, park lands, fire hall and retail uses. This application also includes an opportunity for a potential future pedestrian grade-separated crossing above the Barrie rail corridor at the southeast corner of the subdivision;
- Bombardier Aerospace (de Havilland) production facility expansion and a new Aerostructure building and flight test hanger; and
- New Centennial College Aerospace Campus proposed at 65 Carl Hall Road, located directly east of the Barrie rail corridor.

Other notable features contained within the Downsview Secondary Plan and planned for the area include an expanded urban park, new institutional and commercial uses and a proposed transit hub where the subway line intersects the Barrie rail corridor. It is noted that portions of the Stanley Greene Neighbourhood have been set aside for Department of National Defence (DND) housing. These houses are to be located directly adjacent to the Barrie rail corridor. A number of other new residential, mixed use and industrial development applications have been submitted for other lands in the vicinity of the rail corridor and are summarized in

Table 3-36.

The City of Toronto has developed an extensive Bike Plan (City of Toronto 2001) and due to the long and straight alignment of the Barrie rail corridor, the City has proposed several trails within the corridor. Known as “rails with trails” these trails are planned to co-exist with rail traffic within the existing ROW. The West Toronto Railpath falls primarily within the Kitchener rail corridor. An EA was recently completed by the City of Toronto detailing an extension to the West Toronto Railpath which includes a portion of the Barrie rail corridor from approximately Mile 3.00 to Lansdowne Avenue. Two other rails with trails are proposed, as summarized in

Table 3-36. The Trails Master Plan also includes six on-road trails and seven off-road trails with crossings of the Barrie rail corridor. In addition, a future park is planned in the Toronto Hydro Greenspace located between Davenport Road and St. Clair Avenue West, to the west of the corridor.

Table 3-36: Proposed Future Development and Trails in the City of Toronto

Development ID	Mile Marker	Name	Description
Development Applications and Proposals			
DA-T-1	3.60	Mixed Use Development	9 storey mixed use building (85 unit condominium)
DA-T-2	3.72	Sterling Road Development	8 acre, mixed use community, 565,000 ft^2 of employment (office, retail, cultural, commercial), 540,000 ft^2 of residential
DA-T-3	3.87	Residential Development	182 Unit Condominium
DA-T-8	4.96	Industrial Development	Two Single Storey Industrial Buildings
DA-T-9	6.56	Mixed Use Development	29 Apartment Units, 204 m^2 Commercial.
DA-T-10	8.00	Commercial Development/ Parking	Not available
DA-T-11	9.55	Bombardier Facilities Expansion	Not available
DA-T-12	9.61	Stanley Green Neighbourhood	Development of the Stanley Greene Neighbourhood in Downsview Park
DA-T-13	10.86	Downsview Subway Application	Not available
Rails with Trails			
Not applicable	2.98 to 3.29	West Toronto Railpath	No crossing, trail proposed within/adjacent to the rail ROW
Not applicable	6.37 to 11.93	York Beltline to Finch Avenue (Currently Unnamed)	No crossing, trail proposed within the rail ROW
On-Road Trail			
Not applicable	3.36	Dundas Street West	Crossing grade not specified
Not applicable	5.84	Rogers Road	Crossing grade not specified
Not applicable	8.39	Bentworth Avenue	Crossing grade not specified
Not applicable	10.50	Carl Hall Road	At-grade crossing
Not applicable	10.75	Future Road1	Grade-separated crossing (below-grade underpass)
Off-Road Trail			
Not applicable	6.15	Not available	Crossing grade not specified
Not applicable	7.15	Not available	Crossing grade not specified
Not applicable	8.39	West of Bentworth Avenue	Crossing grade not specified

Development ID	Mile Marker	Name	Description
Not applicable	9.38	Not available	Crossing grade not specified
Not applicable	9.88	Future Perimeter1	Grade-separated crossing
Not applicable	10.87	Not available	Crossing grade not specified
Not applicable	11.93	Not available	Crossing grade not specified

City of Vaughan

The City of Vaughan's OP Schedule 1, Urban Structure, identifies a number of Intensification Areas. These are areas where significant new development is proposed and includes both new residential and employment opportunities. Two are located within the study area, as follows:

- North of Steeles Avenue on the east and west side of the Barrie rail corridor; and
- North and south of Rutherford Road on both sides of the Barrie rail corridor.

The above Intensification Areas have been identified to "make efficient use of underutilized sites served with a high-level of existing or planned transit" (City of Vaughan, 2015). These areas are generally identified for future mixed uses or employment intensification. Details such as the ratio of residential versus commercial, number of units and number of jobs are not currently known.

The City of Vaughan has also prepared a number of Secondary Plans which plan for new growth and development. Five growth areas are noted in the study area, however three have completed Secondary Plans. The five growth areas are described below.

- The Rutherford GO Station Area was identified by Urban Strategies Inc. (2009) as a valuable area for intensification. No Secondary Plan has been prepared to date; however, it is anticipated that future land use could include a variety of mixed uses at a greater density than that which currently exists;
- The Maple GO Station Secondary Plan (City of Vaughan, 2014) addresses land use in the immediate vicinity of the Maple GO Station. Lands are currently vacant but are scheduled for "Mid-rise Mixed Use" which is planned to include residential uses, retail and offices uses and community facilities, among others;
- Development within the Carrville Secondary Plan area is well underway with some commercial and high density residential sites yet to be completed. The future Block 18 District Park is planned in a location directly adjacent to the Barrie rail corridor at Mile 17.06;
- A future GO Station is proposed at the intersection of Kirby Road and the Barrie rail corridor in the Block 27 Secondary Plan Area (City of Vaughan, 2016). The Secondary Plan is still in draft stage. Lands in the vicinity of the rail corridor and the proposed new station are likely to include a variety of mixed uses with mid- to high-density residential uses and park land areas. This future station is in the early planning stages and is not part of the BRCE Project TPAP. It will be assessed by Metrolinx as part of a separate EA process; and
- Block 28 is located to the north of Block 27. A Secondary Plan has not been developed for the area; however, it is anticipated that this area will be considered as part of the future City of Vaughan urban expansion and may become a future growth area.

Current development applications being reviewed or in progress are listed in Table 3.37. Digital trail plans provided by the City identified three future trails with crossings of the Barrie rail corridor. All are intended to be on-road trails with crossings at the locations listed in Table 3-37.

Table 3-37: Planned Future Development and Trails in the City of Vaughan

Development ID	Mile Marker	Name	Description
Development Applications and Proposals			
DA-V-1	18.05	Townhouse Development	86 stacked townhouses
DA-V-2	18.30	Residential Development	A subdivision development that will contain an estimated total of 216 townhouse units, an estimated total of 762 apartment dwelling units, approximately five internal roads, and two small community parks
DA-V-3	19.35	Industrial Building Development	Proposed development of two industrial buildings
DA-V-4	21.00	Agricultural Use	Zoning amendment to expand the agricultural uses on the property
DA-V-5	22.35	Industrial Use	Proposed 1,204m^2 industrial warehouse building with accessory office use
On-Road Trail			
N/A	14.82	Rivermede Road	Crossing grade not specified
N/A	19.57	Keele Street	Crossing grade not specified
N/A	20.66	Kirby Road	Crossing grade not specified

Township of King

The Township of King has not prepared any Secondary Plans or identified specific growth areas for future development. However, King City is likely to expand as the Township's urban centre, with new residential developments planned for the future (see Table 3-38). King Township is in the process of updating its OP which sets out the vision and land use designations that apply in the community areas, including King City. Specific policies related to transit and transit-oriented development have yet to be specified; however, intensification is recommended. Five future trails have been identified within King City and the remainder of the Township, including three on-road trails and two off-road trails that cross the Barrie rail corridor. These future trail crossings are summarized in Table 3-38.

Table 3-38: Planned Future Development and Trails in the Township of King

Development ID	Mile Marker	Name	Description
Development Applications and Proposals			
DA-K-1	22.89	Residential Subdivision	52 single family residential units
DA-K-2	24.44	Commercial Development	Shopping centre, including supermarket and various retail/service/office uses (14,225 m^2 gross floor area (GFA))
DA-K-3	23.01	Residential Subdivision	Not available
DA-K-4	40.26	Residential Subdivision	Not available
DA-K-5	40.75	Commercial Development	Not available
On-Road Trail			
Not applicable	23.36	Keele Street	Crossing grade not specified
Not applicable	24.60	Dufferin Street	Crossing grade not specified
Not applicable	26.16	Regional Road 40	Crossing grade not specified
Off-Road Trail			
Not applicable	23.98	Not applicable	Crossing grade not specified
Not applicable	40.95	Not applicable	Crossing grade not specified

Town of Aurora

The Town of Aurora has two Secondary Plan Areas directly adjacent to the Barrie rail corridor. The Yonge Street South Secondary Plan, identified as OPA No. 34 (Town of Aurora, 2008 Office Consolidation), is located between the Barrie rail corridor and Bayview Avenue. The Yonge Street South Secondary Plan area is scheduled for future land use including a variety of residential areas with varying densities, institutional uses, open spaces and environmental protection areas. A school is proposed but it is well setback from the Barrie rail corridor.

The Aurora Promenade Secondary Plan and CIP Area is located in the downtown core and includes areas adjacent to the rail corridor at Yonge Street and from Dunning Avenue to Centre Street. The intent of the Plan is to create a vibrant downtown with shopping, living and entertainment uses. The Plan encourages walking and bicycling as transportation options. The Plan includes a Streetscape Design and Implementation Plan.

A number of other new residential, mixed use and industrial and commercial development applications have been submitted in the Town of Aurora within the vicinity of the rail corridor. These future developments are summarized in Table 3-39. The Town has put extensive work into developing a trail system that spans the Town. At this time, three on-road trail and six off-road trails are planned to cross the Barrie rail corridor at various points, as summarized in Table 3-39.

Table 3-39: Planned Future Development and Trails in the Town of Aurora

Development ID	Mile Marker	Name	Description
Development Applications and Proposals			
DA-A-1	27.73	Residential Development	Zoning By-law amendment to permit a retirement home with By-law exceptions on the subject lands
DA-A-2	27.85	Residential Development	The draft plan of subdivision proposed 195 residential units
DA-A-3	28.78	Industrial Building Development	Site plan application for 4 multi-unit industrial buildings with 4,908 m^2 GFA
DA-A-4	29.34	Industrial Addition	Site plan application (received May 2007) to permit an addition to an existing 4,879 m^2. industrial building
DA-A-5	29.40	Residential Development	Not available
DA-A-6	29.59	Commercial Development	Zoning By-law amendment to permit the existing use of the existing businesses and professional office building with By-law exceptions on the subject lands
DA-A-7	29.96	Commercial Development	Zoning by-law amendment to permit business and professional office use. Site plan application to covert the existing house to 177.6 m^2. of office space
DA-A-8	29.96	Commercial Use	Zoning by-law amendment to permit business and professional offices and a Site plan application for a 460 m^2, two storey office building
DA-A-9	30.00	Commercial Use-Permit Application	Application to permit a hair salon/business and professional office within the existing building, including parking
DA-A-10	30.02	Institutional Use and Building Addition	Zoning by-law amendment and Site plan application to allow a day nursery use and develop a 103.2 m^2 addition onto the existing 65.8 m^2 building
DA-A-11	30.95	Industrial Building	Not available
On-Road Trail			
Not applicable	26.47	Bathurst Street	Crossing grade not specified
Not applicable	29.17	Englehard Drive	Crossing grade not specified
Not applicable	29.52	Cousins Drive	Grade-separated crossing
Off-Road Trail [1]			
Not applicable	27.15	Not applicable	Grade-separated crossing
Not applicable	27.71	Not applicable	Grade-separated crossing
Not applicable	28.27	Not applicable	Grade-separated crossing

Development ID	Mile Marker	Name	Description
Not applicable	28.89	Not applicable	Grade-separated crossing
Not applicable	30.42	Not applicable	Grade-separated crossing
Not applicable	31.63	Not applicable	Grade-separated crossing

[1] Electronic data files provided by the Town show a number of proposed at-grade trail crossings; however, during consultation with the Town on April 28, 2016 it was indicated that the Town will strive to make all secondary rail crossings grade-separated in the future.

Town of Newmarket

Review of the Town of Newmarket OP Land Use Schedule A, indicates that there is one small area identified as "Emerging Residential" situated between the Barrie rail corridor and Main Street North. The area currently includes a single dwelling and landscaped yard. Future land use will include more dense residential uses. The number of houses and layout is not available and appears to be in the very early planning stages at this time. For the purposes of this EPR, it is anticipated that future development will be planned to be compatible with the expanded Barrie rail corridor.

York Region has identified a number of future trails for municipalities within its jurisdiction. Two on-road trails and one off-road trail are proposed within the Town of Newmarket and include crossing of the Barrie rail corridor. These proposed crossing locations and future development applications are summarized in Table 3-40.

Table 3-40: Planned Future Development and Trails in the Town of Newmarket

Development ID	Mile Marker	Name	Description
Development Applications and Proposals			
DA-N-1	32.26	Residential Development	28 Townhouses
DA-N-2	33.00	Parking Lot Expansion	Parking Lot Expansion
DA-N-3	34.18	Commercial Relocation	Relocation of Union Hotel and parking lots (lot area 1,119 m^2)
DA-N-4	34.43	Parking Lot Expansion	Not available
DA-N-5	34.74	Residential Subdivision	9 townhomes and 2 semi-detached units are proposed
DA-N-6	32.26	Residential Subdivision	Not available
On-Road Trail			
Not applicable	32.75	Mulock Drive	Crossing grade not specified
Not applicable	34.16	Davis Drive	Crossing grade not specified
Off-Road Trail			
Not applicable	32.31	Not available	Crossing grade not specified

Town of East Gwillimbury

The Town of East Gwillimbury has prepared a Draft Secondary Plan for the Green Lane area (Town of East Gwillimbury, 2014). The land use schedule for this area indicates that the land use along the east side of the Barrie rail corridor is likely to remain unchanged from its current "Environmental Protection" use. Lands on the west side of the corridor will be developed into residential and mixed uses. The future development applications within the Town are outlined below in Table 3-41. It is noted that there are no proposed trails within the Town that are planned to cross or parallel the Barrie rail corridor.

Table 3-41: Planned Future Development in the Town of East Gwillimbury

Development ID	Mile Marker	Name	Description
Development Applications and Proposals			
DA-EG-1	30.40	Residential Subdivision	Not available
DA-EG-2	35.92	Residential Subdivision	Not available
DA-EG-3	37.84	Residential Subdivision	Not available
DA-EG-4	38.03	Residential Subdivision	Not available
DA-EG-5	38.15	Residential Subdivision	Not available

Town of Bradford West Gwillimbury

The Town of Bradford West Gwillimbury has identified five new development areas on Schedule C of its OP. The areas are located to the north, west and south of the Bradford Urban Area and are not located in close proximity to the Barrie rail corridor.

The Town of Bradford West Gwillimbury Trail System Master Plan (Dillon Consulting, 2010) identifies several future trail systems within the Town. Of relevance to the BRCE Project is the a "rail-with-trail" route that is planned to co-exist parallel to, or within, the existing Barrie rail corridor, and two off-road trails that cross the corridor. These trails are summarized in Table 3-42.

It is noted that Schedule F-2 (Transportation) of the Town of Bradford West Gwillimbury OP, identifies a potential Highway 400/404 Link (Bradford Bypass). The proposed Bypass is to be located between Industrial Road and Line 9 within the Bradford Urban Area. The MTO received approval from the Minister of the Environment with Cabinet's concurrence in 2002 for the Ministry's Highway 400 - Highway 404 Extension Link (Bradford Bypass) EA. This EA approval allowed the Ministry to proceed to the design and construction stage for a new 16.2 km long rural 4-lane controlled access freeway.

The proposed freeway is planned to connect Highway 400 in the Town of Bradford West Gwillimbury to the proposed northerly Highway 404 Extension in the Town of East Gwillimbury. Though construction was expected to begin by the end of 2009, with the change in provincial government in 2006 and the subsequent release of the Growth Plan (2006), which did not include the Highway 400/404 Link in its plans for future highways, construction did not proceed.

Table 3-42: Planned Future Development and Trails in the Town of Bradford West Gwillimbury

Crossing Mile Marker	Description
Rails with Trails	
41.45 to 44.61	No crossing, trail proposed within the rail ROW
Off-Road Trail	
41.04	Crossing grade not specified
44.43	Crossing grade not specified
Future Highway	
42.52	Highway 400/404 Link (Bradford Bypass)

Town of Innisfil

Lands in the Town of Innisfil are primarily agricultural and are not expected to change with the exception of lands around the communities of Lefroy-Belle Ewart and Alcona. A copy of the Town of Innisfil OP, Schedule B3, "Land Use: Lefroy-Belle Ewart" is provided in the Socio-Economic and Land Use Characteristics Report within Appendix F of this EPR. This schedule shows that lands in the northern portion of the community on the west side of the corridor are scheduled for future residential development.

Most of the future growth in the Town will be focused around the future GO Station in Alcona. OPA No. 1 (Town of Innisfil, 2009) indicates that the Alcona urban settlement boundary will be expanded to the north and south in order to accommodate the projected new residential and employment areas. A Secondary Plan has yet to be prepared to identify the location of specific future land uses in the expansion areas. Within the existing limits of Alcona, lands directly adjacent to the Barrie rail corridor are planned for future Special Neighbourhood Commercial uses. The area where Innisfil Beach Road intersects with the Barrie rail corridor is identified as a future Community Gateway and is intended to be the main access into and out of the community. New low density residential areas are also proposed along with "Future Urban" areas directly adjacent to the corridor.

Within the Alcona expansion area, located at the northeast corner of 6th Line and the rail ROW, a new residential subdivision, known as the Sleeping Lion neighbourhood is currently being developed. The subdivision will include approximately 1,184 residential units as well as amenity areas such as parks and trials. The planned future developments and trails for the Town of Innisfil are noted in Table 3-43.

The Town of Innisfil Transportation Master Plan (HDR Corporation, 2013) identifies a number of future trail development options that include a "rail-with-trail" route that is planned to co-exist parallel to, or within, the existing Barrie rail corridor. An additional on-road trail and three off-road trails are also planned with routes which cross the Barrie rail corridor. These proposed trail crossings are summarized in Table 3-43.

Table 3-43: Planned Future Development and Trails in the Town of Innisfil

Development ID	Crossing Mile Marker	Name	Description
Development Applications and Proposals			
DA-I-1	53.84	Sleeping Lion Subdivision	962 single residential units, townhouse, park and commercial blocks
DA-I-2	55.15	Alcona Downs-Residential Development	Multi-phase subdivision including 383 single residential units, various semi-detached and townhomes and commercial units
Trail in Rail ROW			
Not applicable	51.64 to 52.57	Not applicable	At-grade crossing
On-Road Trail			
Not applicable	52.82	Belle Aire Beach Road	Crossing grade not specified
Off-Road Trail			
Not applicable	51.51	Not applicable	Crossing grade not specified
Not applicable	52.57	Not applicable	Crossing grade not specified
Not applicable	55.49	Not applicable	Crossing grade not specified

City of Barrie

The City of Barrie recently annexed lands along its southern boundary. Future land uses in the area are identified in Schedule 9A; Community Structure of the Draft Hewitt's Secondary Plan. Future development is likely to include mixed residential/commercial uses to the west of the Barrie rail corridor and residential uses to the east.

Within the original City boundaries, several "Intensification Areas" have been identified. Two primary nodes for intensification are identified along the Barrie rail corridor at Big Bay Point Road and Little Avenue, respectively.

The City's downtown core is also identified as an "Urban Growth Centre" and includes a target of 150 persons and jobs/hectare. The entire Urban Growth Centre is in close proximity to the Barrie rail corridor. As a result of these targets, development is expected to intensify; however the type of land use is not expected to change significantly (e.g., existing urban lands will remain urban with a greater level of intensification, that is, increased density levels).

The City has developed a Multi-modal Active Transportation Master Plan (Genivar, 2014) that identifies a number of future trails to be developed, and has proposed a "rail-with-trail" route in which a trail is planned to co-exist parallel to, or within, the existing Barrie rail corridor. An additional five on-road bicycle lanes are proposed that will cross the rail corridor as well as two off-road routes. These future trails are summarized in Table 3-44.

Table 3-44: Planned Future Development and Trails in the City of Barrie

Development ID	Crossing Mile Marker	Name	Description
Development Applications and Proposals			
DA-B-1	59.30	Mapleview Residential Development	Residential Development. Approximately 1,241 residential units, including apartment buildings and townhouses with a trail connection to the Barrie South GO Station
Rails with Trails			
Not applicable	61.58 to 61.70	Not applicable	At-grade crossing
On-Road Trail			
Not applicable	59.29	Mapleview Drive	Crossing grade not specified
Not applicable	60.27	Big Bay Point Road	Crossing grade not specified
Not applicable	61.14	Cox Mill Road	Crossing grade not specified
Not applicable	62.03	Minet's Point Road	Crossing grade not specified
Not applicable	63.09	Essa Road	Crossing grade not specified
Off-Road Trail			
Not applicable	61.21	Not applicable	Crossing grade not specified
Not applicable	61.39	Not applicable	Crossing grade not specified

3.1.9 *Air Quality*

An assessment of air quality was completed for the BRCE study area. A copy of the Air Quality Study is provided in Appendix G of this EPR. This section of the EPR provides a summary of the existing air quality conditions within the BRCE study area. For the purposes of this TPAP, the baseline air quality conditions are based on the current train service scenario using 2015 as the horizon year, and accounts for background air quality and road traffic emissions for the 2021 horizon year. This is referred to as the "Future No Build" scenario[23]. Although the current train service uses Tier 3 trains, the "Future No Build" scenario has been modelled based on the assumption that the GO Train fleet for the Barrie rail corridor will be upgraded to Tier 4 emission standards when expanded service is implemented. It is noted that manufacturers are expected to have emissions lower than these Tier 4 values to ensure that they meet these criteria. Therefore, the proposed infrastructure and service levels represent a credible worst-case scenario. The following five rail segments were selected to represent the air quality throughout the entire Barrie rail corridor as illustrated in Figure 3-7.

- Segment A: Area around Mile 8.00 extending north and south;
- Segment B: Area around Mile 17.50 extending north and south;
- Segment C: Area around the King City GO Station extending north and south;
- Segment D: Area around the Bradford GO Station extending north and south as well as an area surrounding the proposed Bradford Layover Facility north of the station; and
- Segment E: Area around Allandale Waterfront GO Station extending south.

The five representative rail segments were selected based on a range of surrounding environment and existing rail features, which includes rural areas, urban areas, various land uses and their associated population densities. Existing rail features include straight and curved rail segments, which influence train speeds. The selection of the five representative rail segments allowed for a conservative assessment of the potential effects associated with expansion of the existing Barrie rail corridor.

The existing air quality conditions were determined based on air dispersion modelling of emissions at 54 sensitive receptor locations throughout the five rail segments along the Barrie rail corridor. With the exception of Segment D, which included 14 sensitive receptors to account for both the Bradford GO Station and the proposed Bradford Layover Facility, all other segments included 10 sensitive receptors. Sensitive receptors are described by the MOECC as:

- A child care facility;
- A health care facility;
- A senior citizens' residence or long-term care facility;
- An educational facility; or
- A dwelling.

A list of contaminants associated with diesel locomotives was screened and an in-depth assessment was performed on selected representative contaminants, which included:

- acrolein;
- benzene;
- benzo(a)pyrene (B(a)P);
- nitrogen dioxide (NO_2); and

[23] "Future No Build" corresponds to the current service level scenario consisting of 14 diesel trains, which takes into account future projected road traffic not associated with GO Transit operations, allowing for a more accurate comparison of future conditions.

- particulate matter less than 2.5 µm ($PM_{2.5}$).

The assessment of existing air quality conditions was based on the combined emissions from background sources and GO Transit sources. Background air quality levels were obtained from the MOECC and National Air Pollution Surveillance (NAPS) stations in close proximity to all five rail segments to ensure the most representative background concentrations were selected for the study area. GO Transit sources include current (existing) train emissions and current GO Station parking lot emissions (from cars and buses).

Table 3-45 to Table 3-49 summarize the existing air quality conditions for each of the five contaminants for the most impacted sensitive receptors based on the "Future No Build" scenario. The results for all 50 sensitive receptors are provided in the Air Quality Study provided in Appendix G of this EPR. A description of the values included in Table 3-45 to Table 3-49 provide the following information:

- The averaging period;
- The criterion concentration;
- The range of median contaminant concentrations for the most impacted sensitive receptor for the time period;
- The range of contaminant concentrations for the most impacted sensitive receptor for the time period; and
- The percentage (%) of criterion range shows the range of contaminant concentrations divided by the criterion. Values over 100% indicate that the contaminant concentration exceeds the criterion.

In summary, existing "Future No Build" air quality concentrations for acrolein and NO_2 do not exceed applicable criteria. Benzene and $PM_{2.5}$ concentrations for the "Future No Build" scenario occasionally exceed applicable criteria. B(a)P concentrations in the "Future No Build" air quality conditions regularly exceed applicable criteria; however, in some cases, the background levels of B(a)P exceed the applicable criteria, which is common across Canada in urban areas. The concentration of B(a)P decreases as the distance from the rail corridor to the sensitive receptor increases.

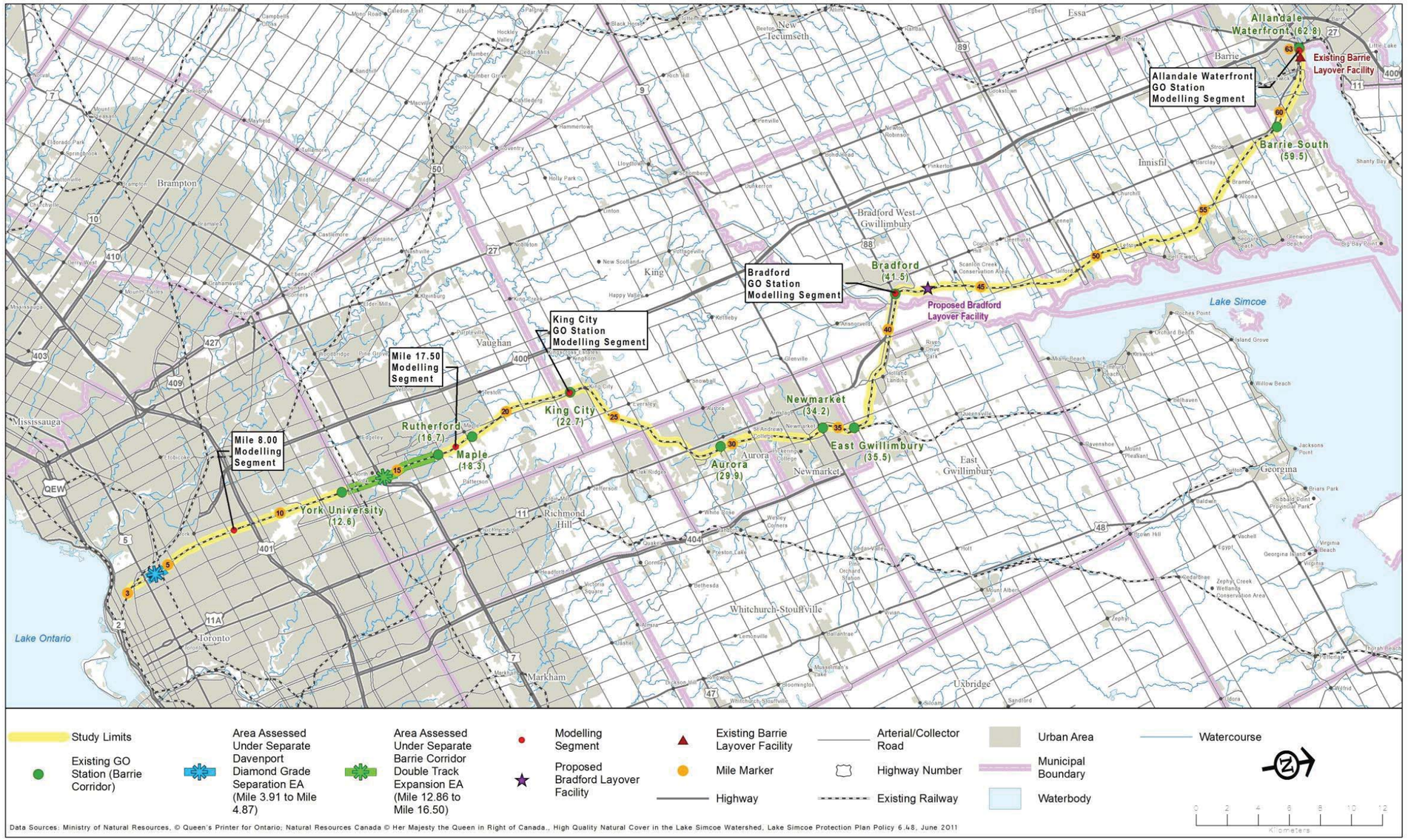

Figure 3-7: Air Quality Modelling Segments in Study Area

Table 3-45: Existing (Future No Build) Air Quality Conditions-Acrolein

Averaging Period	Criterion (µg/m^3)	Range of Median Contaminant Concentrations for Selected SRs (µg/ m^3)	Range of Contaminant Concentrations for Selected SRs (µg/ m^3)	% of Criterion Range
1-HR	4.5	0.188-0.194	0.187-1.183	4.2%-26%
24-HR	0.4	0.187-0.189	0.187-0.214	46.8%-53%

Table 3-46: Existing (Future No Build) Air Quality Conditions-Benzene

Averaging Period	Criterion (µg/m^3)	Range of Median Contaminant Concentrations for Selected SRs (µg/ m^3)	Range of Contaminant Concentrations for Selected SRs (µg/ m^3)	% of Criterion Range
24-HR	2.3	0.289-0.769	0.00003-1.585	0.001%-69%
Annual	0.45	0.290-0.769	0.268-0.771	59.6%-171%

Table 3-47: Existing (Future No Build) Air Quality Conditions-Benzo(a)pyrene

Averaging Period	Criterion (µg/m^3)	Range of Median Contaminant Concentrations for Selected SRs (µg/ m^3)	Range of Contaminant Concentrations for Selected SRs (µg/ m^3)	% of Criterion Range
24-HR	0.00005	0.000019-0.000083	0.000003-0.001084	6%-2168%
Annual	0.00001	0.000020-0.000083	0.000014-0.000119	140%-1190%

Table 3-48: Existing (Future No Build) Air Quality Conditions-Nitrogen Dioxide

Averaging Period	Criterion (µg/m^3)	Range of Median Contaminant Concentrations for Selected SRs (µg/ m^3)	Range of Contaminant Concentrations for Selected SRs (µg/ m^3)	% of Criterion Range
1-HR	400	9.98-32.24	0.02-166.77	0.005%-41.7%
24-HR	200	11.80-33.92	0.16-102.34	0.08%-51.2%
Annual	60	14.30-34.24	13.56-40.12	22.6%-66.9%

Table 3-49: Existing (Future No Build) Air Quality Conditions-Particulate Matter < 2.5 µm

Averaging Period	Criterion (µg/m^3)	Range of Median Contaminant Concentrations for Selected SRs (µg/ m^3)	Range of Contaminant Concentrations for Selected SRs (µg/ m^3)	% of Criterion Range
24-HR	27	5.09-6.55	0.0003-34.52	0.001%-127.8%
Annual	8.8	5.66-7.70	5.47-9.19	62.2%-104.4%

3.1.10 Noise

The MOECC and GO Transit developed a “Draft Protocol for Noise and Vibration Assessment” in January, 1995 (Draft #9), hereafter referred to in this Report as the Ministry of the Environment and Climate Change (MOECC)/GO Draft Protocol. This document was used as the primary guideline document for assessment of the rail noise and vibration levels. It is assumed that decibels (dB) referenced in the MOECC/GO Draft Protocol refers to A-weighted decibels (dBA), the typical unit of measurement used in environmental noise assessments.

The Noise and Vibration Impact Assessment is provided in Appendix H of this EPR.

Consistent with the MOECC/GO Draft Protocol, receptors for the noise assessment included the following noise sensitive land uses:

- Residences;
- Hotels, motels and campgrounds;
- Schools, universities, libraries, and daycare centres;
- Hospitals and clinics, nursing/retirement homes; and
- Churches and places of worship.

A total of 162 Sensitive Receptors were identified and modelled within the study area as summarized in Table 3-50. These Sensitive Receptors within the study area are mainly residential houses located adjacent to the Barrie rail corridor. In general, areas of receptors were identified using publicly available address point databases or through visual identification using publicly available satellite aerial images. Modelling was completed for all these receptors; however, results presented in the Noise and Vibration Impact Assessment are for selected representative receptors. It is also worth noting that the area between Bloor Street West and Davenport Road was not investigated within the noise assessment due to it being covered within the Davenport Diamond Grade Separation EPR completed under a separate TPAP (Metrolinx, 2016).

Sensitive Receptors have different setback distances and various degrees of visual screening from the Barrie rail corridor. Residences closest to the track (e.g., typically those adjacent to the ROW of the rail corridor) are anticipated to have the greatest Adjusted Noise Impact. As the separation distance increases between the Barrie rail corridor and receptors, the sound environment becomes predominantly background sound unrelated to activities on the railway line. In practice, this means that sound levels need not be evaluated at receptors beyond those nearest to the Barrie rail corridor.

The MOECC/GO Draft Protocol introduces the concept of daytime and nighttime receptors. Daytime receptors are to be placed in the front yard or backyard of a residential property, whichever is most exposed to the noise source. The protocol indicates that the daytime receptors can be any point on a sensitive property that is not less than 15 metres away from the nearest track centreline, but is normally a point that is 3 metres from the side of the building that is most exposed to the noise source. Nighttime receptors are to be placed at the plane of the bedroom window that is most exposed to the noise source. For simplicity, the daytime and nighttime receptors were collocated at a single horizontal position, approximately at the most exposed façade of the dwelling.

Daytime sound levels were assessed at a height of 1.5 metres above local grade. Nighttime sound levels were assessed at the bedroom window height, assumed to be 4.5 metres above ground (e.g., the second storey bedroom window).

3.1.10.1 *Existing and Planned Noise Barriers*

Existing noise barriers are defined as barriers built as of January 2016 or planned barriers identified during various EAs for portions of the rail corridor completed prior to January 2016 but which may not yet be built. Existing noise barriers were included in both the existing and the future modelling scenarios.

Built noise barriers were identified by conducting an investigation using publically available aerial photography and street-level imagery, as well as Metrolinx's RailView software. The approximate location and height of the barriers were identified and recorded in detail during the noise modelling exercise.

Planned noise barriers were identified in information provided by Metrolinx (e.g., previously completed EAs). While it is recognized that not all of these barriers have been implemented at the time of this assessment, they were included in all modelling scenarios as it is assumed they would be in place prior to implementing the Future Scenarios. It should be noted these 'planned barriers' were not evaluated for technical feasibility as part of this Assessment.

Where buildings were thought to provide significant noise shielding for areas in close proximity to the track, they were included in the modelling. The approximate height and geometry were identified using publicly accessible aerial imagery (e.g., Google Earth). Buildings were included in the Existing and Future, Scenario 1 and 2 models.

3.1.10.2 *Ambient Sound Levels*

According to the MOECC/GO Draft Protocol, ambient noise is the sound existing at a receptor in the absence of all noise from the BRCE Project. Ambient noise can be used as a component of the sound level objective, in combination with the sound level from any existing rail activity. The ambient levels are primarily due to noise from local road traffic and surrounding industry.

Ambient noise from road traffic and other background noise sources including industry was assumed to be negligible compared to existing rail traffic noise at most receptors near the Barrie rail corridor, and not a significant factor in determining the desirable sound level objective. Therefore, ambient noise was not assessed.

The MOECC/GO Draft Protocol stipulates the use of a model known as Sound from Trains Environmental Analysis Method (STEAM) for predicting rail traffic noise levels (MOECC, 1990). As a result of consultations with Metrolinx, the present study deviated from this guidance in that the rail traffic noise levels were modelled using the "Federal Noise and Vibration Impact Assessment" (Federal Transit Administration Protocol (FTA Protocol)) (FTA, 2006) incorporated using Cadna/A. Cadna/A allows for the modelling of complex railway schemes including curves, parallel and intervening tracks which cannot be easily assessed using STEAM. Cadna/A is software that includes the implementation of the FTA noise propagation algorithms, as well as aspects of International Organization for Standardization (ISO) 9613 algorithms (ISO 1994, ISO 1996). A comparison of the STEAM and FTA modelling methods is summarized in the Noise and Vibration Impact Assessment, provided in Appendix H of this EPR.

The Existing and Future scenario noise levels were modelled for the entire study area. Results at each discrete receptor were used to establish the Adjusted Noise Impact of Future, Scenario 1 relative to the Existing scenario, as well as that of Future, Scenario 2 relative to the Existing scenario. The noise modelling results are summarized in Section 4.3.7 of this EPR.

As per the FTA Protocol, the diesel trains and electric trains were modelled with a noise source height of 2.4 metres (8 ft) and 0.6 metres (2 ft), respectively. The noise from a diesel train is dominated by the engine (located at approximately 2.4 metres above the rail) with a lesser contribution from the wheels (located at approximately 0.6 metres above the rail). The noise from an electric train, on the other hand, is dominated, by wheel noise (emitted at approximately 0.6 metres above the rail), since the electric engine is relatively quiet.

Topography was included in the Cadna/A model to take into consideration the elevation differences of the railway, receptors and the intervening terrain. The topographical features were assumed to be the same in the Existing and Future scenarios. High-resolution (e.g., 5 metre) topographical information was obtained from public databases (MNRF, 2016).

Noise sources associated with GO diesel and/or electric rail activity include:

- Moving trains (applicable to all trains);
- Idling trains at each station (applicable to all trains);
- Road crossings signals (applicable to all trains);
- Crossovers and switches (applicable to all trains);
- Wheel squeal (applicable to all trains); and
- Pantograph (applicable to electric trains only).

Table 3-50 below identifies the existing noise levels at each Sensitive Receptor within the study area along with the objective level for determining noise effects of the BRCE Project. The noise modelling results are summarized in Section 4.3.7 of this EPR and documented in further detail in the Noise and Vibration Impact Assessment.

Table 3-50: Sensitive Receptors within the BRCE Project Study Area and BRCE Project Objective Noise Levels

Sensitive Receptor ID[1]	Closest Mile Marker	Description	Municipality	Receptor Distance from Nearest Track (m)	Existing Noise Levels (dBA)[2]		Project Objective (dBA)[3]	
					Daytime	Nighttime	Daytime	Nighttime
SR001	4	Single Detached Dwelling	Toronto	100	46	40	55	50
SR002	4	Single Detached Dwelling	Toronto	90	47	39	55	50
SR003	4	Townhouse	Toronto	70	51	43	55	50
SR004	4	Townhouse	Toronto	50	54	46	55	50
SR005	5	Townhouse	Toronto	40	54	48	55	50
SR006	5	Townhouse	Toronto	30	57	51	57	51
SR007	5	Single Detached Dwelling	Toronto	20	59	53	59	53
SR008	6	Single Detached Dwelling	Toronto	20	59	54	59	54
SR009	6	Single Detached Dwelling	Toronto	30	55	50	55	50
SR010	6	Single Detached Dwelling	Toronto	40	53	49	55	50
SR011	7	Single Detached Dwelling	Toronto	40	57	49	57	50
SR012	7	Single Detached Dwelling	Toronto	40	63	50	63	50
SR013	8	Condominium Buildings	Toronto	40	55	50	55	50
SR014	8	Single Detached Dwelling	Toronto	80	51	46	55	50
SR015	8	Single Detached Dwelling	Toronto	70	55	49	55	50
SR016	9	Single Detached Dwelling	Toronto	110	46	40	55	50
SR017	9	Mount Sinai Memorial Park	Toronto	30	56	50	56	50
SR018	10	Approved Future Development	Toronto	50	53	50	55	50
SR019	9	Single Detached Dwelling	Toronto	140	48	44	55	50
SR020	11	Church	Toronto	80	52	50	55	50
SR021	14	Single Detached Dwelling	Vaughan	50	44	46	55	50
SR022	14	Single Detached Dwelling	Vaughan	40	52	48	55	50
SR023	17	Single Detached Dwelling	Vaughan	60	61	56	61	56
SR024	17	Single Detached Dwelling	Vaughan	80	62	52	62	52
SR025	17	Single Detached Dwelling	Vaughan	40	52	47	55	50
SR026	18	Single Detached Dwelling	Vaughan	50	51	46	55	50
SR027	18	Single Detached Dwelling	Vaughan	40	53	48	55	50
SR028	18	Single Detached Dwelling	Vaughan	100	55	51	55	51
SR029	18	Townhouse	Vaughan	60	61	55	61	55
SR030	18	Approved Future Development	Vaughan	60	60	55	60	55
SR031	19	Townhouse	Vaughan	400	48	46	55	50
SR032	19	Single Detached Dwelling	Vaughan	230	52	45	55	50
SR033	19	Single Detached Dwelling	Vaughan	250	53	48	55	50
SR034	20	Single Detached Dwelling	Vaughan	350	48	43	55	50
SR035	20	Single Detached Dwelling	Vaughan	300	51	43	55	50
SR036	21	Single Detached Dwelling	Vaughan	360	50	47	55	50
SR037	21	Single Detached Dwelling	Vaughan	320	52	49	55	50
SR038	21	Single Detached Dwelling	Vaughan	250	50	48	55	50
SR039	21	Single Detached Dwelling	Vaughan	30	57	54	57	54

Sensitive Receptor ID[1]	Closest Mile Marker	Description	Municipality	Receptor Distance from Nearest Track (m)	Existing Noise Levels (dBA)[2]		Project Objective (dBA)[3]	
					Daytime	Nighttime	Daytime	Nighttime
SR040	22	Single Detached Dwelling	Vaughan	20	68	67	68	67
SR041	22	Single Detached Dwelling	Vaughan	30	56	56	56	56
SR042	22	Single Detached Dwelling	King Township	80	56	55	56	55
SR043	23	Single Detached Dwelling	King Township	90	60	56	60	56
SR044	23	Single Detached Dwelling	King Township	80	58	54	58	54
SR045	23	Single Detached Dwelling	King Township	50	52	50	55	50
SR046	23	Approved Future Development	King Township	130	57	57	57	57
SR047	23	Single Detached Dwelling	King Township	40	47	47	55	50
SR048	24	Single Detached Dwelling	King Township	50	53	49	55	50
SR049	24	Single Detached Dwelling	King Township	110	46	44	55	50
SR050	24	Single Detached Dwelling	King Township	50	52	48	55	50
SR051	25	Single Detached Dwelling	King Township	100	58	54	58	54
SR052	25	Single Detached Dwelling	King Township	110	56	57	56	57
SR053	25	School	King Township	340	48	47	55	50
SR054	26	Single Detached Dwelling	King Township	30	66	57	66	57
SR055	26	Single Detached Dwelling	King Township	40	62	62	62	62
SR056	26	Single Detached Dwelling	King Township	70	54	55	55	55
SR057	27	Single Detached Dwelling	Aurora	40	53	53	55	53
SR058	27	Single Detached Dwelling	Aurora	60	51	50	55	50
SR059	28	Single Detached Dwelling	Aurora	80	50	49	55	50
SR060	28	Single Detached Dwelling	Aurora	40	44	51	55	51
SR061	28	Townhouse	Aurora	40	53	52	55	52
SR062	28	Single Detached Dwelling	Aurora	120	46	47	55	50
SR063	29	Single Detached Dwelling	Aurora	300	41	44	55	50
SR064	29	Single Detached Dwelling	Aurora	280	52	51	55	51
SR065	30	Single Detached Dwelling	Aurora	110	54	51	55	51
SR066	29	Single Detached Dwelling	Aurora	340	48	48	55	50
SR067	30	Single Detached Dwelling	Aurora	50	62	60	62	60
SR068	30	Single Detached Dwelling	Aurora	30	56	56	56	56
SR069	31	Single Detached Dwelling	Aurora	40	55	51	55	51
SR070	31	Single Detached Dwelling	Aurora	370	52	49	55	50
SR071	31	Single Detached Dwelling	Aurora	70	59	61	59	61
SR072	32	Single Detached Dwelling	Newmarket	50	51	52	55	52
SR073	32	Single Detached Dwelling	Newmarket	130	49	47	55	50
SR074	33	Single Detached Dwelling	Newmarket	350	48	49	55	50
SR075	34	Single Detached Dwelling	Newmarket	40	65	55	65	55
SR076	33	Single Detached Dwelling	Newmarket	240	51	52	55	52
SR077	34	Single Detached Dwelling	Newmarket	160	56	51	56	51

Sensitive Receptor ID[1]	Closest Mile Marker	Description	Municipality	Receptor Distance from Nearest Track (m)	Existing Noise Levels (dBA)[2]		Project Objective (dBA)[3]	
					Daytime	Nighttime	Daytime	Nighttime
SR078	34	Single Detached Dwelling	Newmarket	90	60	55	60	55
SR079	34	Single Detached Dwelling	Newmarket	80	56	59	56	59
SR080	34	Single Detached Dwelling	Newmarket	20	57	59	57	59
SR081	34	Single Detached Dwelling	Newmarket	20	54	55	55	55
SR082	34	Single Detached Dwelling	Newmarket	40	51	55	55	55
SR083	34	Single Detached Dwelling	Newmarket	50	51	52	55	52
SR084	34	Single Detached Dwelling	Newmarket	30	59	54	59	54
SR085	35	Single Detached Dwelling	Newmarket	100	59	51	59	51
SR086	35	Single Detached Dwelling	Newmarket	320	52	50	55	50
SR087	35	Single Detached Dwelling	Newmarket	290	50	49	55	50
SR088	35	Single Detached Dwelling	Newmarket	50	57	60	57	60
SR089	36	Single Detached Dwelling	East Gwillimbury	250	52	52	55	52
SR090	36	Single Detached Dwelling	East Gwillimbury	220	52	52	55	52
SR091	36	Single Detached Dwelling	East Gwillimbury	60	61	51	61	51
SR092	37	Single Detached Dwelling	East Gwillimbury	240	50	53	55	53
SR093	38	Single Detached Dwelling	East Gwillimbury	50	63	56	63	56
SR094	38	Single Detached Dwelling	East Gwillimbury	100	58	52	58	52
SR095	38	Single Detached Dwelling	East Gwillimbury	20	69	64	69	64
SR096	38	Single Detached Dwelling	East Gwillimbury	180	55	50	55	50

Sensitive Receptor ID[1]	Closest Mile Marker	Description	Municipality	Receptor Distance from Nearest Track (m)	Existing Noise Levels (dBA)[2]		Project Objective (dBA)[3]	
					Daytime	Nighttime	Daytime	Nighttime
SR097	39	Single Detached Dwelling	East Gwillimbury	70	55	56	55	56
SR098	39	Single Detached Dwelling	East Gwillimbury	140	52	48	55	50
SR099	39	Single Detached Dwelling	East Gwillimbury	20	65	67	65	67
SR100	39	Single Detached Dwelling	East Gwillimbury	20	68	57	68	57
SR101	40	Single Detached Dwelling	East Gwillimbury	260	53	52	55	52
SR102	40	Single Detached Dwelling	East Gwillimbury	80	58	58	58	58
SR103	41	Single Detached Dwelling	King Township	50	64	63	64	63
SR104	41	Single Detached Dwelling	Bradford West Gwillimbury	60	59	61	59	61
SR105	42	Single Detached Dwelling	Bradford West Gwillimbury	170	56	50	56	50
SR106	42	Single Detached Dwelling	Bradford West Gwillimbury	180	55	52	55	52
SR107	45	Single Detached Dwelling	Bradford West Gwillimbury	120	55	57	55	57
SR108	45	Single Detached Dwelling	Bradford West Gwillimbury	160	56	51	56	51
SR109	45	Single Detached Dwelling	Bradford West Gwillimbury	140	55	56	55	56
SR110	46	Single Detached Dwelling	Bradford West Gwillimbury	100	55	50	55	50
SR111	46	Single Detached Dwelling	Bradford West Gwillimbury	180	58	59	58	59
SR112	46	Single Detached Dwelling	Bradford West Gwillimbury	60	62	54	62	54
SR113	47	Single Detached Dwelling	Bradford West Gwillimbury	80	58	50	58	50
SR114	47	Single Detached Dwelling	Bradford West Gwillimbury	110	57	56	57	56
SR115	47	Single Detached Dwelling	Bradford West Gwillimbury	100	59	56	59	56

Sensitive Receptor ID[1]	Closest Mile Marker	Description	Municipality	Receptor Distance from Nearest Track (m)	Existing Noise Levels (dBA)[2]		Project Objective (dBA)[3]	
					Daytime	Nighttime	Daytime	Nighttime
SR116	48	Single Detached Dwelling	Innisfil	60	50	49	55	50
SR117	49	Single Detached Dwelling	Innisfil	50	63	54	63	54
SR118	49	Single Detached Dwelling	Innisfil	50	64	59	64	59
SR119	49	Single Detached Dwelling	Innisfil	50	64	61	64	61
SR120	49	Single Detached Dwelling	Innisfil	50	65	62	65	62
SR121	49	Single Detached Dwelling	Innisfil	190	55	55	55	55
SR122	50	Single Detached Dwelling	Innisfil	200	54	51	55	51
SR123	50	Single Detached Dwelling	Innisfil	210	52	52	55	52
SR124	51	Single Detached Dwelling	Innisfil	100	55	57	55	57
SR125	52	Single Detached Dwelling	Innisfil	110	58	51	58	51
SR126	52	Single Detached Dwelling	Innisfil	70	61	58	61	58
SR127	52	Single Detached Dwelling	Innisfil	40	64	63	64	63
SR128	52	Single Detached Dwelling	Innisfil	130	55	56	55	56
SR129	53	Approved Future Development	Innisfil	50	55	53	55	53
SR130	53	Single Detached Dwelling	Innisfil	60	57	52	57	52
SR131	53	Single Detached Dwelling	Innisfil	230	53	52	55	52
SR132	54	Single Detached Dwelling	Innisfil	180	54	50	55	50
SR133	55	Single Detached Dwelling	Innisfil	60	61	59	61	59
SR134	54	Single Detached Dwelling	Innisfil	300	44	40	55	50
SR135	55	Single Detached Dwelling	Innisfil	120	56	55	56	55
SR136	55	Townhouse	Innisfil	70	58	60	58	60
SR137	55	Single Detached Dwelling	Innisfil	70	54	53	55	53
SR138	55	Single Detached Dwelling	Innisfil	50	62	52	62	52
SR139	55	Single Detached Dwelling	Innisfil	50	55	52	55	52
SR140	56	Single Detached Dwelling	Innisfil	100	58	56	58	56
SR141	56	Single Detached Dwelling	Innisfil	60	61	59	61	59
SR142	56	Single Detached Dwelling	Innisfil	200	52	52	55	52
SR143	57	Single Detached Dwelling	Innisfil	50	63	60	63	60
SR144	57	Single Detached Dwelling	Innisfil	70	61	53	61	53
SR145	57	Single Detached Dwelling	Innisfil	290	50	50	55	50
SR146	57	Single Detached Dwelling	Innisfil	240	51	52	55	52
SR147	58	Single Detached Dwelling	Innisfil	40	64	58	64	58
SR148	58	Single Detached Dwelling	Innisfil	40	64	58	64	58
SR149	58	Single Detached Dwelling	Innisfil	40	64	65	64	65
SR150	58	Single Detached Dwelling	Innisfil	50	56	56	56	56
SR151	58	Single Detached Dwelling	Innisfil	50	62	64	62	64
SR152	59	Single Detached Dwelling	Innisfil	70	61	55	61	55
SR153	59	Single Detached Dwelling	Barrie	130	57	55	57	55

Sensitive Receptor ID[1]	Closest Mile Marker	Description	Municipality	Receptor Distance from Nearest Track (m)	Existing Noise Levels (dBA)[2]		Project Objective (dBA)[3]	
					Daytime	Nighttime	Daytime	Nighttime
SR154	59	Single Detached Dwelling	Barrie	60	52	52	55	52
SR155	60	Single Detached Dwelling	Barrie	70	49	47	55	50
SR156	60	School	Barrie	50	40	39	55	50
SR157	61	Single Detached Dwelling	Barrie	50	50	49	55	50
SR158	61	Single Detached Dwelling	Barrie	50	51	50	55	50
SR159	62	Single Detached Dwelling	Barrie	40	50	49	55	50
SR160	62	Single Detached Dwelling	Barrie	150	48	52	55	52
SR161	62	Single Detached Dwelling	Barrie	10	59	59	59	59
SR162	63	Single Detached Dwelling	Barrie	50	54	55	55	55

Notes:

[1] Locations of the Sensitive Receptors are provided in the Noise and Vibration Impact Assessment – specifically, Appendix A.1 in Appendix H of this EPR.

[2] The equivalent continuous noise level for daytime (L_{EQ} (Day)) is evaluated for a 16-hour period (e.g., from 0700h to 2300h) and the L_{EQ} (Night) is evaluated for an 8-hour period (e.g., from 2300h to 0700h).

[3] The objective is the higher of the ambient sound level, combined with the existing rail activity, or 55 dBA (Daytime) / 50 dBA (Nighttime).

3.1.11 *Vibration*

The Vibration Assessment for the BRCE Project was undertaken in accordance with the MOECC/GO Draft Protocol. The MOECC/GO Draft Protocol was used to determine desirable vibration objective levels, assess any predicted vibration effects from the implementation of the BRCE Project and identify locations where mitigation is required for consideration during the detailed design phase.

The Vibration Assessment was based on measurements associated with Metrolinx GO Transit operations for current and future scenarios. The sensitive receptors were screened within the study area and an assessment was performed on each of the selected sensitive receptors. In cases where several sensitive receptors were within close proximity, these receptors were grouped as one sensitive area and the worst case representative receptor was assessed as a surrogate for the sensitive area. In total, 96 sensitive areas were identified within the study area.

The MOECC/GO Draft Protocol established vibration objectives for Metrolinx rail projects. The desirable objective for the BRCE Project is that the vibration velocity experienced at a sensitive receptor due to implementation of the proposed rail infrastructure does not exceed 0.14 mm/s at a point of vibration assessment. In addition, where the vibration from existing operation exceeds 0.14 mm/s, the desirable objective is to not exceed the existing vibration level.

The impact at a point of vibration assessment will fall into one of the following categories as defined in the MOECC/GO Draft Protocol:

- Existing and future vibration velocity remains less than 0.14 mm/s;
- Existing vibration velocity is less than 0.14 mm/s, future vibration velocity is expected to exceed 0.14 mm/s;
- Existing vibration velocity is greater than 0.14 mm/s, future vibration velocity is not expected to exceed this value; and
- Existing vibration velocity is greater than 0.14 mm/s, future vibration velocity is expected to exceed this value.

Furthermore, the MOECC/GO Draft Protocol establishes a framework for the assessment of mitigation where impacts are identified. Specifically, the MOECC/GO Draft Protocol stipulates that the requirement to evaluate mitigation is triggered when the vibration velocity exceeds the desirable objective by 25% or more (e.g., the greater of 0.175 mm/s, or a 25% increase over existing levels).

To assess the effect of implementing the BRCE Project in line with the MOECC/GO Draft Protocol, two groups of measurements were taken. One group of measurements were taken at a series of consecutive setbacks 4.3 metres apart from each other to determine the effect on vibration levels as receptors progress further from the existing track in increments equivalent to one track spacing (e.g., 4.3 metres). The second group of measurements involved measuring the absolute value of the vibration at identified sensitive receptors.

To measure the vibration levels, Type Pro4 Instantel Minimates or MinimatePro and Series IV Instantel Geophones were used. The monitoring equipment was set to start recording when a vibration velocity of 0.127 mm/s or more was detected. This trigger value ensured that values below the lower threshold of 0.14 mm/s were recorded. A minimum of five train passes is required to meet the measurement criteria of the MOECC, and these five or more values are then averaged to provide a valid reading.

The results of the differential setback measurements are shown in Table 3-51. This table illustrates how the vibration increases as the receptors get closer to the track.

Table 3-51: Relative Increase in Vibration as Setback from Track is Reduced

Sensitive Receptor Setback from Existing Track (m)	Sensitive Receptor Setback from Proposed Second Track[1] (m)	Vibration Measurement at Existing Setback[2] (mm/s)	Vibration Measurement at Proposed Second Track Setback[8] (mm/s)	Actual Measured Increase in Vibration (%)	Normalized Increase in Vibration[3] (%)	Mitigation Investigation Required?[4]
19.6	15.3	0.668	1.485	122%	73%	Yes
23.9	19.6	0.524	0.795	52%	54%	Yes
28.2	23.9	0.351	0.524	49%	39%	Yes
32.5	28.2	0.266	0.351	32%	25%	Yes
36.8	32.5	0.244	0.266	9%	13%	No
41.1	36.8	0.203	0.244	20%	3%	No
45.4	41.1	0.216	0.194	-10%	0%	No
49.7	45.4	0.197	0.216	10%	0%	No

[1] For locations where the proposed second track is identified 4.3 metres closer to the sensitive receptor.

[2] For some of the intervals, multiple pairs of data for the existing and proposed setback locations were recorded and the average pass-by measurements are reflected in this table.

[3] Vibration increase was normalized using logarithmic regression.

[4] The MOECC/GO Draft Protocol requires mitigation to be investigated where an increase in vibration exceeds 25% of the desirable objective (0.175 mm/s or 25% above existing level). Further information on vibration potential effects and mitigation investigation for the implementation of the BRCE Rail Infrastructure is discussed in Sections 4.3.8 of this EPR.

By measuring the change in vibration with reduced setback at varying distances, it was determined that there is a critical distance at which the predicted change in vibration exceeds the MOECC/GO Draft Protocol of 25% and therefore requires mitigation to be investigated. From the fieldwork undertaken as part of the vibration study, a critical distance of 32.5 metres from the existing edge of track was determined as the setback threshold. For the purposes of the BRCE Project, a threshold of 32.5 metres from the existing edge of track (or closer) was set as the point where receptors may experience vibration effects greater than 25% over existing conditions and require investigation of mitigation.

To measure the absolute value of the vibration at the identified sensitive receptors measurement locations were selected to correspond to the setback of the implemented BRCE Project. The vibration meters were set up at the measurement locations described in Table 3-52. A linear average of the running average root mean square (RMS) vibration velocity of all GO Train pass-bys that occurred at each sensitive receptor was calculated and the results are provided in Table 3-52. The location of these sensitive receptors is provided in Appendix B.4 of the Noise and Vibration Impact Assessment which is located in Appendix H of this EPR.

Metrolinx has determined that vibration at 75 metres will not exceed the 0.14 mm/s criterion (Section 7 of Metrolinx-GO Transit Adjacent Development Guidelines (2013)). Therefore, sensitive receptors setback further than 75 metres from the proposed second track are not included in Table 3-52. If the proposed second track is located beyond the existing track, then the setback from the receptor will not change and therefore the vibration velocity at this receptor is not expected to increase and has not been included in Table 3-52. Full details for these measurements are included in the Noise and Vibration Impact Assessment provided in Appendix H of this EPR.

Table 3-52: Sensitive Receptor Measurements and Mitigation Investigation Requirements

Sensitive Area	Side of track	South End Mile Marker (mile)	North End Mile Marker (mile)	Representative Sensitive Receptor#	UTM Coordinate[1] (E)	UTM Coordinate(N)	Address of Representative Receptor	Municipality	Distance (Foundation to existing Track) (m)	Distance to New Track (m)	Measured RMS Pass (mm/s)[2, 3]	Does Measured Value Exceed Desired Objective Level?	Predicted Increase by Logarithmic Regression (%)	Mitigation Investigation Required?[4]
SA008	East	5.65	5.86	SR008	624175	4837566	80 Innes Avenue	Toronto	11	7	0.86	Yes	128%	Yes
SA009	East	5.86	6.12	SR009	624052	4837875	382 Rogers Road	Toronto	42	38	0.27	Yes	1%	No
SA011	East	6.12	6.50	SR011	623855	4838602	446 Gilbert Avenue	Toronto	40	36	0.42	Yes	5%	No
SA012	East	6.52	6.89	SR012	623714	4838922	14 Croham Road	Toronto	37	33	0.43	Yes	13%	No
SA014	West	6.87	7.81	SR014	623376	4840402	22 Eugene Street	Toronto	17	13	-	Yes	86%	Yes
SA085	West	10.50	10.30	SR085	622553	4844894	39 Carl Hall Road	Toronto	58	54	-	Yes	0%	No
SA099	West	11.17	10.87	SR099	622357	4845852	37 Bakersfield Street (7th Day Adventist Church)	Toronto	76	72	-	Yes	0%	No
SA021	West	13.81	14.23	SR021	621623	4850776	1 Gemma Court	Vaughan	38	34	0.16	Yes	10%	No
SA022	East	15.50	16.83	SR022	620813	4854697	146 Westway Crescent	Vaughan	38	34	0.20	Yes	10%	No
SA023	West	16.83	17.50	SR023	620576	4855754	75 Foxhill Drive	Vaughan	40	36	0.17	Yes	5%	No
SA026	West	18.10	18.49	SR026	619852	4857573	79 Lindenshire Avenue	Vaughan	40	36	0.35	Yes	5%	No
SA029	West	21.99	22.66	SR029	618359	4862977	2330 King-Vaughan Road	King City	17	13	1.78	Yes	86%	Yes
SA035	West	25.70	26.10	SR035	621070	4868072	925 Side Road 15 (York 40)	King City	12	8	1.56	Yes	119%	Yes
SA038	West	26.60	27.70	SR038	622368	4869496	113 Stemmle Drive	Aurora	38	34	0.69	Yes	10%	No
SA039	West	28.10	28.50	SR039	622995	4870880	107 Poplar Crescent	Aurora	79	75	0.34	Yes	0%	No
SA041	West	29.17	29.80	SR041	623496	4872775	113 Metcalfe Street	Aurora	64	60	0.20	Yes	0%	No
SA043	West	29.80	29.99	SR043	623377	4873108	99 Regional Road 15	Aurora	64	60	0.35	Yes	0%	No
SA045	West	29.99	30.04	SR045	623396	4873157	125 Regional Road 15	Aurora	47	43	0.36	Yes	0%	No
SA046	West	30.44	30.60	SR046	623261	4873721	102 Walton Drive	Aurora	39	35	0.24	Yes	8%	No
SA048	West	31.50	32.00	SR048	622995	4875378	182 St. John's Sideroad	Aurora	50	46	0.44	Yes	0%	No
SA049	West	31.50	32.00	SR049	623091	4875944	904 Bosworth Court	Newmarket	42	38	0.53	Yes	1%	No
SA052	West	33.64	33.95	SR052	623519	4879268	475 Queen Street	Newmarket	42	38	0.12	No	N/A	No

Sensitive Area	Side of track	South End Mile Marker (mile)	North End Mile Marker (mile)	Representative Sensitive Receptor#	UTM Coordinate[1] (E)	UTM Coordinate(N)	Address of Representative Receptor	Municipality	Distance (Foundation to existing Track) (m)	Distance to New Track (m)	Measured RMS Pass (mm/s)[2, 3]	Does Measured Value Exceed Desired Objective Level?	Predicted Increase by Logarithmic Regression (%)	Mitigation Investigation Required?[4]
SA053	West	35.64	36.38	SR053	623318	4882630	28 Rogers Road	East Gwillimbury	51	47	-	Yes	0%	No
SA055	West	36.85	37.65	SR055	620960	4883279	19074 Regional Road 51	East Gwillimbury	24	20	-	Yes	54%	Yes
SA057	East	37.71	38.65	SR057	620249	4884061	65 Regional Road 13	East Gwillimbury	13	9	4.04	Yes	112%	Yes
SA091	West	41.38	41.25	SR091	615798	4885602	126 Bridge Street	Bradford West Gwillimbury	76	72	-	Yes	0%	No
SA065	West	48.20	48.65	SR065	616638	4896320	14 Line just West of Tracks	Bradford West Gwillimbury	52	48	0.45	Yes	0%	No
SA066	West	48.65	49.05	SR066	616158	4897547	1384 Gilford Road	Innisfil	50	46	1.50	Yes	0%	No
SA074	West	56.90	57.49	SR074	611179	4909106	1950 10th Line	Innisfil	40	36	0.28	Yes	5%	No
SA079	West	60.30	61.14	SR079	608278	4912654	203 Dodson Road	Barrie	38	34	0.25	Yes	10%	No

[1] Note that all UTM coordinate are in UTM zone 17T.

[2] If the "Measured RMS Pass (mm/s)" shows "0.00", that indicates that a valid measurement was obtained at that location and it indicates that no vibration above 0.127 mm/s was recorded for that location.

[3] If the "Measured RMS Pass (mm/s)" shows "-", no measurement is available for that location. For SA081 to SA101 field measurements were not undertaken as it was considered that sufficient monitoring had been undertaken to characterize the Barrie rail corridor vibration levels. For other sensitive areas where no measurement is available, this is due to the background vibration levels being so high that it was not possible to identify the train pass-bys.

[4] Further information on vibration potential effects and mitigation investigation for the implementation of the BRCE Project Rail Infrastructure is discussed in Section 4.3.8 of this EPR.

3.1.12 *Traffic and Transportation Infrastructure*

A TIA was completed for the BRCE Project, which is provided in Appendix I of this EPR. The TIA included a summary of how the rail infrastructure associated with the BRCE Project intersects numerous existing roads, highways, pedestrian bridges, tunnels, and farm crossings. It also intersects existing and proposed active transportation trails. An inventory of these crossings is summarized as follows:

- 35 existing grade separated crossings (refer to Table 3-53);
- 54 existing at-grade rail/road crossings (refer to Table 3-54);
- 13 existing at-grade farm crossings (refer to Table 3-55);
- Seven proposed trails parallel to and within the Barrie rail ROW (refer to Table 3-56);
- Ten existing and 25 proposed trails located on road ROWs, which cross the Barrie rail ROW (refer to Table 3-57); and
- Three existing and 25 proposed trails not located on road ROWs, which cross the Barrie rail ROW (refer to Table 3-58).

There is one existing at-grade rail/rail crossing on the Barrie rail corridor (CPR North Toronto Subdivision at Davenport, Mile 4.87). This crossing has been addressed as part of the separate TPAP study completed for the Davenport Diamond Grade Separation project (Metrolinx, 2016) and is, therefore, not included in Table 3-54. It is anticipated that the expansion of two existing grade separations, at Major Mackenzie Drive (Mile 18.10) and Yonge Street, (Mile 28.50), will be required during construction of Phase One of the BRCE Project, and the expansion of the Coxmill Road (Mile 61.14) grade separation will be required during construction of a future phase of the Project.

Table 3-53: Existing Grade Separated Crossings

Location (and Mileage)	Jurisdiction	Classification	Description
Strachan Avenue, Mile 1.59	Toronto	arterial road	rail underpass
King Street, Mile 1.99	Toronto	arterial road	rail overpass
Queen Street, Mile 2.46	Toronto	arterial road	rail overpass
Brock Avenue, Mile 2.79	Toronto	collector road	rail overpass
Lansdowne Avenue, Mile 3.12	Toronto	arterial road	rail overpass
Dundas Street, Mile 3.37	Toronto	arterial road	rail underpass
Bloor Street, Mile 3.91	Toronto	four lane arterial road	rail overpass
Pedestrian Tunnel, Mile 4.08[1]	Toronto	pedestrian tunnel	pedestrian tunnel under tracks (now closed)
Dupont Street, Mile 4.51[1]	Toronto	four lane arterial road	rail overpass
Davenport Road, Mile 4.87	Toronto	arterial road	rail overpass
St. Clair Avenue, Mile 5.24	Toronto	four lane arterial road	rail overpass
Innes Avenue, Mile 5.65	Toronto	pedestrian bridge	pedestrian bridge over tracks
Rogers Road, Mile 5.86	Toronto	arterial road	rail overpass
Dunraven Drive, Mile 6.12	Toronto	pedestrian tunnel	pedestrian tunnel under tracks
Eglinton Avenue, Mile 6.50	Toronto	arterial road	rail underpass
Lawrence Avenue, Mile 7.81	Toronto	arterial road	rail overpass
Highway 401, Mile 8.80	Province	Highway	rail underpass
Wilson Avenue, Mile 9.12	Toronto	arterial road	rail overpass
Sheppard Avenue, Mile 10.87	Toronto	arterial road	rail overpass
Finch Avenue, Mile 11.65	Toronto	arterial road	rail underpass
Steeles Avenue, Mile 12.92	Toronto	arterial road	rail overpass
Snider Grade Separation, Mile 13.20	CNR	rail	rail overpass
Highway 407[2], Mile 13.81	Joint Venture/MTO	Highway	rail overpass
Highway 7, Mile 14.23	York Region	arterial road	rail overpass
Major Mackenzie Drive, Mile 18.10	York Region	arterial road	rail overpass
Keele Street, Mile 19.60	York Region	arterial road	rail underpass
King Road, Mile 23.26	York Region	arterial road	rail underpass
Keele Street, Mile 23.30	York Region	arterial road	rail underpass
Bathurst Street, Mile 26.50	York Region	arterial road	rail underpass
Yonge Street, Mile 28.50	York Region	arterial road	rail overpass
Queen Street, Mile 33.95	Newmarket	minor residential collector	rail underpass
Concession Road 2 Mile 36.38	Town of East Gwillimbury	arterial road	rail underpass (under construction)
6th Line, Mile 53.70	Town of Innisfil	major collector road	rail underpass
Big Bay Point Road, Mile 60.30	Barrie	arterial road	rail underpass
Coxmill Road, Mile 61.14	Barrie	major collector road	rail overpass

[1]These crossings are part of the Davenport Diamond Grade Separation TPAP (Mile 3.91 to Mile 4.87) and were not considered part of the BRCE Project study area.

[2] An EA has been completed and approved for the future Highway 407 Transitway. A grade-separated crossing of the Barrie rail corridor is recommended. Its exact location has yet to be determined; however, preferred routing would include a rail overpass on the north side of Highway 407. Metrolinx will work with MTO to confirm a location and design details.

Table 3-54: Existing At-Grade Rail/Road Crossings

Mileage	Road Name	Existing Warning Devices[1]
4.19[2]	Wallace Avenue	RFBG
6.89	Castlefield Avenue	RFBG

Mileage	Road Name	Existing Warning Devices[1]
10.50	Carl Hall Road	RFBG
11.90	TTC Bus Route	RFBG
14.82	Rivermede Road	RFBG
15.50	Langstaff Road	RFBG
16.83	Rutherford Road	RFBG
18.49	McNaughton Road	RFBG
19.40	Teston Road	RFBG
20.66	Kirby Road	RFBG
21.99	King-Vaughan Road	RFBG
22.73	Station Road	RFBG
24.60	Dufferin Street	RFBG
26.10	Bloomington Road (Sideroad 15)	RFBG
29.17	Engelhard Drive	RFBG
29.99	Wellington Street	RFBG
30.04	Centre Street	RFBG
31.28	St. John's Sideroad	RFBG
32.75	Mulock Drive	RFBG
33.55	Water Street	RFBG
33.64	Timothy Street	RFBG
34.16	Davis Drive	RFBG
35.61	Green Lane East	RFBG
36.38	Concession Road 2	RFBG (currently being grade separated)
37.65	Chapman Street	RFBG
37.71	Old Yonge Street	RFBG
38.43	Bradford Street	RFBG
39.33	Oriole Drive	RFBG
39.66	Bathurst Street (Townline)	RFBG
40.53	Kalver Street	Closed
40.93	Toll Road	RFBG
41.02	Private Drive	R
41.25	Private Access	R
41.39	Given Road	RFBG
41.94	Bradford West Gwillimbury Wastewater Treatment Plant access	RFBG
42.26	Industrial Road	RFBG
43.37	Line 9	RFBG
44.34	Line 10	RFBG
45.37	Line 11	RFBG
46.29	Line 12	RFBG
47.21	Line 13	RFBG
49.05	Gilford Road	RFBG
49.24	1st Line (Shore Acres Drive)	RFBG
50.12	2nd Line	RFBG
50.99	3rd Line	RFBG
51.89	Killarney Beach Road	RFBG
52.82	Belle Aire Beach Road	RFBG
54.56	7th Line	RFBG
55.55	Innisfil Beach Road	RFBG
56.59	9th Line	RFBG
57.49	10th Line	RFBG
58.47	11th Line (Lockhart Road)	RFBG
59.29	Mapleview Drive East	RFBG
61.34	Little Avenue	RFBG
62.03	Minet's Point Road	RFBG

[1] Automatic warning devices: Reflectorized Crossbucks (R), Flashing Lights (F), Bell (B), Gates (G), Grade Separation (GS).
[2]This crossing is part of the Davenport Diamond Grade Separation EA (Mile 3.91 to Mile 4.87) and was not considered part of the BRCE Project study area.

Further details regarding the existing conditions at each of the individual crossings identified in Table 3-55 are provided in the TIA contained within Appendix I of this EPR. Due to the infrequent use of these farm crossings it is expected that the exposure index will be low at these locations, even after full implementation of the proposed works associated with the BRCE Project. However, for private crossings where there are two or more tracks, a warning system with gates (RFBG) is required if the exposure index is over 100, as per the Grade Crossing Standards (Transport Canada, July, 2014).

Further details on the trails and trail crossings noted above are provided in Table 3-56, Table 3-57 and Table 3-58.

Table 3-55: Existing At-Grade Rail/Farm Crossings

Location (Mileage)	Authority
19.72	City of Vaughan
20.03	City of Vaughan
20.43	City of Vaughan
21.10	City of Vaughan
21.49	City of Vaughan
21.70	City of Vaughan
25.55	Township of King
44.86	Town of Bradford West Gwillimbury
48.20	Town of Innisfil
48.65	Town of Innisfil
49.88	Town of Innisfil
58.15	Town of Innisfil
58.94	City of Barrie

[1] *Automatic warning devices: Reflectorized Crossbucks (R), Flashing Lights (F), Bell (B), Gates (G), Grade Separation (GS).*

Table 3-56: Proposed At-Grade Trails on Rail Right-Of-Way

Location (Mileage)	Authority	Road/Trail Name
2.98 to 3.29	City of Toronto	West Toronto Railpath
6.37 to 11.93	City of Toronto	Unnamed
41.45 to 43.12	Town of Bradford West Gwillimbury	Unnamed
43.87 to 44.12	Town of Bradford West Gwillimbury	Unnamed
44.49 to 44.61	Town of Bradford West Gwillimbury	Unnamed
51.64 to 52.57	Town of Innisfil	Unnamed
61.58 to 61.70	City of Barrie	Unnamed

Table 3-57: Trail Crossings on Road Right-of-Way

Location (Mileage)	Proposed (PR) or Existing (EX)	Authority	Road/Trail Name	Grade-separated (GS), At-grade (A), or Not-specified (N)
3.36	PR	City of Toronto	Dundas Street West	N
4.54	PR	City of Toronto	Dupont Street	N
4.85	EX	City of Toronto	Davenport Road	A
5.84	PR	City of Toronto	Rogers Road	N
8.39	PR	City of Toronto	Bentworth Avenue	N
10.50	PR	City of Toronto	Carl Hall Road	A
10.75	PR	City of Toronto	Future Road [1]	GS (below-grade underpass)
14.82	PR	City of Vaughan	Rivermede Road	N
19.57	PR	City of Vaughan	Keele Street	N
20.66	PR	City of Vaughan	Kirby Road	N
23.36	PR	Township of King	Keele Street	N
24.60	PR	Township of King	Dufferin Street	N
26.16	PR	Township of King	Regional Road 40	N
26.47	PR	Town of Aurora	Bathurst Street	GS
29.17	PR	Town of Aurora	Engelhard Drive	GS
29.52	PR	Town of Aurora	Cousins Drive	GS
29.99	EX	Town of Aurora	Wellington Street East	A
31.28	EX	Town of Aurora	St. Johns Sideroad	A
32.75	PR (2)[1]	Town of Newmarket	Mulock Drive	N
33.55	EX	Town of Newmarket	Water Street	A
33.64	EX	Town of Newmarket	Timothy Street	A
34.16	PR (2)[2]	Town of Newmarket	Davis Drive	N
35.58	EX	Town of East Gwillimbury	Nokiidaa Bike Trail	A
35.61	EX	Town of East Gwillimbury	Green Lane East	A
37.81	EX	Town of East Gwillimbury	Holland Landing Road	A
38.43	EX	Town of East Gwillimbury	Bradford Street	A
39.33	EX	Town of East Gwillimbury	Oriole Drive	A
52.82	PR	Town of Innisfil	Belle Aire Beach Road	N
59.29	PR	City of Barrie	Mapleview Drive	N
60.27	PR	City of Barrie	Big Bay Point Road	N
61.14	PR	City of Barrie	Cox Mill Road	N
62.03	PR	City of Barrie	Minet's Point Road	N
63.09	PR	City of Barrie	Essa Road	N

[1] *Trail proposed on both sides of the road.*
[2] *Downsview Secondary Plan Transportation Master Plan.*

Table 3-58: Off-Road Trail Crossings

Location (Mileage)	Proposed (PR) or Existing (EX)	Authority	Road/Trail Name	Grade-separated (GS), At-grade (A), or Not Specified (N)
6.15	PR	City of Toronto	Unnamed	N
7.15	PR (2)	City of Toronto	Unnamed	N
8.39	PR	City of Toronto	West of Bentworth Avenue	N
9.38	PR	City of Toronto	Unnamed	N
9.88	PR	City of Toronto	Future Perimeter[1]	GS
10.87	PR	City of Toronto	Unnamed	N
11.93	PR	City of Toronto	Unnamed	N
15.53	PR	City of Vaughan	Unnamed	N
23.98	PR	Township of King	Unnamed	N
40.95	PR	Township of King	Unnamed	N
27.15	PR	Town of Aurora	Unnamed	GS
27.71	PR	Town of Aurora	Unnamed	GS
28.27	PR	Town of Aurora	Unnamed	GS
28.89	PR	Town of Aurora	Unnamed	GS
30.42	PR	Town of Aurora	Unnamed	GS
31.63	PR	Town of Aurora	Unnamed	GS
32.31	PR	Town of Newmarket	Unnamed	N
34.92	EX	Town of Newmarket	Nokiidaa Bike Trail	A
41.04	PR	Town of Bradford West Gwillimbury	Unnamed	N
41.49	EX	Metrolinx (in Town of Bradford West Gwillimbury)	Pedestrian crossing at Bradford GO Station	A
41.56	EX	Metrolinx (in Town of Bradford West Gwillimbury)	Pedestrian crossing at Bradford GO Station	A
44.43	PR	Town of Bradford West Gwillimbury	Unnamed	N
51.51	PR	Town of Innisfil	Unnamed	N
52.57	PR	Town of Innisfil	Unnamed	N
55.49	PR	Town of Innisfil	Unnamed	N
61.21	PR	City of Barrie	Unnamed	N
61.39	PR	City of Barrie	Unnamed	N

[1] *Source: Downsview Secondary Plan Transportation Master Plan.*

In addition to the locations noted in the previous tables, the following proposed trail locations have been identified in the Town of Innisfil's draft Trail Master Plan:

- 10th Line (Mile 57.49) – Secondary Trail;
- Innisfil Beach Road (Mile 55.55) – Multi-use Trail;
- 7th Line (Mile 54.56) – Paved Shoulder;
- 6th Line (Mile 53.70) – Multi-use Trail;
- Belle Air Beach Road (Mile 52.82) – Sidewalk;
- Killarney Beach Road (Mile 51.89) – Sidewalk;
- Shore Acres Drive (Mile 49.24) – Paved Shoulder; and
- Gilford Road (Mile 49.05) – Sharrow.

Ontario does not currently have a numeric warrant for pedestrian/cycling grade separation. However, Book 15 (Pedestrian Crossing Facilities) of the Ontario Traffic Manual (OTM) recommends that need for grade separated pedestrian crossings "be assessed using a numeric warrant as a screening tool to determine if further assessments" will be required. The suggested numeric warrant includes the following elements:

- An exposure-based criterion that measures the level of interaction and conflict of a crossing (e.g., the vehicular and pedestrian traffic must exceed a minimum threshold such as that of a controlled crossing);
- A directness ratio that measures crossing opportunities;
- Condition-based criteria (e.g., crossing of barriers such as freeway and railway links);
- Consideration of alternative at-grade measures to accommodate the crossing needs; and
- Safety records if it is an existing facility.

It is noted that OTM Book 15 also recommends that local municipalities adopt customized pedestrian policies as tools to assist in the decision process. Exposure warrants for at-grade controlled pedestrian crossings are outlined in OTM Book 12.

3.1.12.1 Traffic Operations

Existing conditions associated with rail infrastructure as it relates to traffic operations are provided below. Details related to road traffic operations within the vicinity of the GO Stations and the proposed layover facility are summarized in Section 3.2.12 and Section 3.3.12 of this EPR and provided in the TIA (located in Appendix I of this EPR).

At present, commuter rail service along the Barrie rail corridor comprises the following:

Weekday Service:

- Five 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 for these trains is approximately 30 minutes. Two additional southbound trains run from the Maple GO Station to Union

Station in the A.M. peak, creating approximately 15 minute headways between 7:00 A.M. and 8:00 A.M. south of the Maple GO Station;

- Seven 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 is offered throughout the day on Saturdays, Sundays and holidays. Three southbound trains run from the Allandale Waterfront GO Station to Union Station in 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 GO Station.

The existing GO schedules for these trains are provided for reference in the TIA.

3.1.13 *Utilities and Municipal Infrastructure*

As noted in Section 2.1.8, the existing Barrie rail corridor ROW intersects numerous utilities. A total of 669 private utilities and municipal infrastructure works may be affected by the proposed rail infrastructure. These utilities include hydro, gas, telecommunication cables, traffic and street lighting cables as well as municipal watermains and sewers. Table 3-59 summarizes the utilities that have been identified from the crossing list that may be affected by the proposed rail infrastructure work associated with the BRCE Project.

Table 3-59: Utilities and Municipal Infrastructure

	Sewer	WM	Telecom	Gas/Oil	Hydro	Overhead	MX/CNR[1]	Others
City of Toronto- Mile 1.35 to 12.90	27	15	48	32	17	38	36	1
City of Vaughan- Mile 12.90 to 22.5	8	9	14	7	1	8	7	0
Township of King- Part I Mile 22.5 to 26.49	11	7	15	7	0	6	10	0
Town of Aurora- Mile 26.49 to 31.50	8	15	16	5	1	10	16	0
Town of Newmarket- Mile 31.50 to 35.37	27	11	2	5	2	14	31	0
Town of East Gwillimbury- Mile 35.37 to 39.66	6	3	16	6	0	2	3	0
Town of Bradford West Gwillimbury- Mile 40.99 to 47.72	5	3	10	3	1	0	0	0
Town of Innisfil- Mile 47.72 to 58.45	5	2	20	7	0	5	0	0
City of Barrie- Mile 58.45 to 63.00	40	10	16	7	5	7	0	0
TOTAL	137	75	157	79	27	90	103	1

Notes:
[1] MX/CNR – Metrolinx and CN Track signal cables

3.2 Existing GO Stations

The existing conditions and features described in Section 3.1 provide a general characterization across the BRCE Project. This section provides additional details regarding the existing conditions and features specifically within the study area of the existing GO Stations associated with the BRCE Project. These include the following:

- Rutherford GO Station;
- Maple GO Station;
- King City GO Station;
- Aurora GO Station;
- Newmarket GO Station;
- East Gwillimbury GO Station;
- Bradford GO Station;
- Barrie South GO Station; and
- Allandale Waterfront GO Station.

The proposed station improvements associated with the Caledonia and Downsview Park GO Stations (assessed as part of other projects) and the existing York University GO Station are not discussed further within this section. The proposed station improvements for these three locations are being carried out as separate contracts and are not part of the BRCE Project.

3.2.1 *Physical Environment*

A detailed description of the overall physical environment for the Barrie rail corridor was previously discussed in Section 3.1.1 of this EPR. As such, further discussion of the physical environment is not repeated herein, as the following sections outline the existing conditions specific to the GO Station lands.

3.2.2 *Aquatic Environment*

Watercourses are present at four of the nine GO Stations. Details regarding these watercourses are provided below.

Rutherford GO Station

Westminster Creek generally flows from north to south and is crossed by the existing rail ROW, adjacent to the Rutherford GO Station, south of Rutherford Road. Westminster Creek is identified as consisting of some flood vulnerable areas, as the Upper West Don River subwatershed lacks stormwater management (Don River Watershed Plan, 2009).

The watercourse at the station crossing was considered to be the headwater of this creek, and was characterized as a ponded area of a wetland that was very slow-moving. The channel was relatively undefined, and was not considered to be direct fish habitat, but contributes water quality and quantity to direct fish habitat downstream.

The substrate in the area of the existing rail ROW was identified as detritus and muck, and the wetland/watercourse contained cattails and Common Reed (*Phragmites australis ssp. australis*). The wetland appeared to receive the majority of its upstream water from drainage ditches. This watercourse is characterized as a permanent, warm water watercourse.

Based on information obtained from the MNRF Natural Heritage Information Centre (NHIC), Redside Dace is identified as a SAR potentially being located in sections of the West Don River which are upstream of the Mile 15.40 crossing (south of the Rutherford GO Station). It is noted that Redside Dace are not found within the stretch that crosses the corridor.

Maple GO Station

No watercourses are present in the vicinity of this station.

King City GO Station

A tributary of the East Humber River flows west of the station and crosses the station in the vicinity of Mile 22.60. This tributary is classified as having warmwater conditions. Based on background information and observations made during the site reconnaissance, the watercourses in the East Humber River system, including the one at the King City GO Station, primarily contain warm to cool-water species including: White Sucker (*Catostomus commersonii*), Bluntnose Minnow (*Pimephales notatus*), Fathead Minnow (*Pimephales promelas*), Blacknose Dace (*Rhinichthys atratulus*), Pumpkinseed (*Lepomis gibbosus*), Johnny Darter, Brown Bullhead (*Ameiurus nebulosus*) and Yellow Bullhead (*Ameiurus natalis*), and various other common cyprinid species.

Aurora GO Station

No watercourses are present in the vicinity of this station.

Newmarket GO Station

The Newmarket GO Station lies in close proximity to the East Branch of the Holland River. A small tributary crosses the station and joins the main branch to the east of the corridor. This section of the East Holland River flows through a highly channelized and hardened morphology. The substrate in the area is primarily comprised of concrete, cobble, gravel, and sand. Fish usage would likely include warm water species due to limited groundwater input, though this watercourse is considered to be permanent direct fish habitat.

East Gwillimbury GO Station

No watercourses are present in the vicinity of this station. The East Holland River is located to the east of the station but is well outside the proposed footprint area of the proposed station upgrades.

Bradford GO Station

A drainage canal is located directly east of the station, flowing eastward into the West Holland River. A small drainage feature directs surface flow through the station parking area and across the station platform into the canal. The main stem of the West Holland River, a large riverine habitat, is identified as having a warm water thermal regime and provides habitat to a diverse range of sportfish. Species primarily consist of bass, carp, sunfishes, and a range of minnows. It is assumed that these species would also be present in the canal.

Barrie South GO Station

No watercourses are present in the vicinity of this station.

Allandale Waterfront GO Station

No watercourses are present in the vicinity of this station.

3.2.3 Terrestrial Environment

Vegetation communities are present at five GO Stations. Details are provided below.

Rutherford GO Station

There is a cattail marsh community along the east side of the Rutherford GO Station platform. This extends eastward along the Westminster Creek. Deciduous forests are also present along the upper slopes of the Westminster Creek valley.

Maple GO Station

There are no vegetation communities present in the vicinity of this station.

King City GO Station

The King City GO Station is located within a Natural Core Area of the ORMCP Area. Lands to the west and south are part of the provincially significant King-Vaughan Wetland Complex, and the Maple Uplands and Kettles Provincial ANSI. The PSW is comprised of a variety of shallow marsh, meadow marsh, deciduous swamp and mixed swamp communities.

Aurora GO Station

There are no vegetation communities present in the vicinity of this station.

Newmarket GO Station

The Newmarket GO Station is located in the well-developed Town Centre. There are small cultural woodlands immediately east and west of the station along a tributary of the East Holland River. These woodlands may provide

habitat for some species that prefer forest edge and open woodland habitats.

East Gwillimbury GO Station

There are no vegetation communities present in the vicinity of this station.

Bradford GO Station

The Bradford GO Station is surrounded by commercial businesses to the west and agricultural lands to the east and south. As such, natural areas are limited to a small cultural woodland adjacent to the parking area and a narrow marsh community running along the drainage canal to the east of the station.

Barrie South GO Station

A large natural area lies to the east of the Barrie South GO Station. The area includes mixed swamp, swamp thicket, cultural thicket, coniferous forest and cultural woodland communities. A cultural meadow is also present to the west and south of the parking area.

Allandale Waterfront GO Station

There are no vegetation communities present in the vicinity of this station.

3.2.4 *Tree Inventory*

A comprehensive tree inventory was completed for the entire BRCE study area. A copy of the Tree Inventory Plan and Arborist Report is provided in Appendix B of this EPR. The characteristic conditions of land used by the existing GO Stations, where tree groups were assessed, are summarized below.

Rutherford GO Station

Tree cover is sparse at the north limit of the proposed GO Station improvements due to the marsh on the east side and the storm water ponds on the west side. Tree cover was mainly found at the south limit of the expansion within the thicket on the east side.

Maple GO Station

No trees 10 cm DBH or greater, were found within the area of the proposed GO Station improvements. All woody vegetation within the expansion area consisted of shrubs that comprise a cultural thicket on the west side of the corridor. The east side of the corridor and lands immediately adjacent are occupied by the existing GO Station and contained no trees.

King City GO Station

The existing rail corridor at this station is approximately 75 metres wide and no expansion into off-site lands is required for the proposed GO Station improvements. All of the trees identified within this proposed expansion area are located in the deciduous swamp on the west side of the corridor (a component of the provincially significant King-Vaughan Wetland Complex), at the south limit of the station improvements.

Aurora GO Station

No trees 10 cm DBH or greater, were found within the area of the proposed GO Station improvements due to the existing land use (e.g., station, parking lot, and industrial).

Newmarket GO Station

Trees within the area of the proposed GO Station improvements were found within the existing corridor, rear yards and the wooded area located at the west and east side of the existing platform. The remainder of the site is occupied by parking for the existing station.

East Gwillimbury GO Station

No trees 10 cm DBH or greater, were found within the area of the proposed GO Station improvements due to the open park area on the east side and the existing rail platform and stormwater management areas on the west side.

Bradford GO Station

There were no trees identified within the existing rail corridor. Though the area proposed for acquisition to accommodate the GO Station improvements is mainly disturbed, but it includes portions of a treed swamp and a cultural thicket.

Barrie South GO Station

The lands west of the tracks are occupied by a stormwater pond and the existing GO Station. There were no trees identified within the existing rail corridor; however, the area proposed for acquisition to the east of the tracks is occupied predominantly by cultural thicket and a mixed (e.g., deciduous and coniferous) treed swamp.

Allandale Waterfront GO Station

The lands around this GO Station are disturbed or manicured and no trees 10 cm or greater, were found within the proposed expansion area.

3.2.5 *Significant Natural Features*

Significant Natural Features are present at five GO Stations. Details regarding these features are provided below.

Rutherford GO Station

Westminster Creek flows around the GO Station site. The valley associated with this creek is considered to be a Significant Valleyland. In addition, SWH may also be present within the wetlands and forested areas adjacent to the creek.

Maple GO Station

Some of the open areas adjacent to the station may provide SWH for open country and grassland birds and other wildlife. No other Significant Natural Features are present.

King City GO Station

The King City GO Station is located within a Natural Core Area of the ORMCP. Lands to the west and south are part of the provincially significant King-Vaughan Wetland Complex, and the Maple Uplands and Kettles Provincial ANSI. The PSW provides Significant and Candidate SWH for a variety of species, including birds, amphibians and reptiles as well as a number of SCC and Endangered and Threatened Species.

Aurora GO Station

There are no Significant Natural Features present in the vicinity of this station.

Newmarket GO Station

There are small cultural woodlands immediately east and west of the station along a tributary of the East Holland River. These woodlands may provide habitat for some species that prefer forest edge and open woodland habitats. Larger natural areas are located east of the station on the east side of the East Holland River within the Mabel Davis Conservation Area, owned and managed by the LSRCA. It is noted that the East Holland River provides fish habitat and is identified as an Urban Linkage in the Greenbelt Plan.

East Gwillimbury GO Station

The East Holland River is located to the east of the station. As noted above, the river provides fish habitat and is identified as an Urban Linkage in the Greenbelt Plan.

Bradford GO Station

A drainage feature crosses through the station site. Given its proximity to the West Holland River, there is some potential for aquatic SAR to be present. Additional surveys will be conducted prior to construction to confirm.

Barrie South GO Station

Wetlands are present in the large natural area to the east of the station. These wetlands have not been evaluated to determine their significance under provincial criteria. A wide variety of bird, reptile and amphibian species are likely to inhabit the area. A cultural meadow is also present to the west and south of the parking area. Some open country bird species may make use of this habitat.

Allandale Waterfront GO Station

There are no Significant Natural Features present in the vicinity of this station.

3.2.6 *Archaeological Resources*

3.2.6.1 *Stage 1 Archaeological Assessment*

A Stage 1 Archaeological Assessment was completed for the BRCE Project, which involved a review of background documents and archaeological records, property inspection, and analysis to identify areas of archaeological potential. Based on the Stage 1 Archaeological Assessment (ASI, 2017), which is provided in Appendix C of this EPR, the following outcomes as they relate to the GO Station improvements are provided below:

The study area associated with improvements at the Maple GO Station is considered disturbed and therefore does not require further archaeological assessment;

Portions of the study area associated with the improvements at the following GO Stations are not considered disturbed and therefore exhibit archaeological potential:

- Rutherford GO Station;
- King City GO Station;
- Aurora GO Station;
- Newmarket GO Station;
- East Gwillimbury GO Station;
- Bradford GO Station;
- Barrie South GO Station; and
- Allandale Waterfront GO Station.

Furthermore, two registered archaeological sites were identified within 50 metres of the GO Stations. These are discussed below.

The Heritage Glen site (referenced as Borden #BcGv-20 in the Stage 1 Archaeological Assessment) is still extant and is currently situated within a fenced-in, grass-covered area immediately beside the Barrie South GO Station. This site is identified as an ancestral Huron-Wendat village site and therefore has Cultural Heritage Value/Interest (CHVI). Since a detailed Stage 3 site-specific Archaeological Assessment has not yet been completed at the site, the limits of the site have not been sufficiently established, and it may extend north into the study area.

The Allandale site (referenced as Borden #BcGw-69 in the Stage 1 Archaeological Assessment) is located in the immediate vicinity of the Allandale Waterfront GO Station. The site is identified as an ancestral Huron-Wendat village and ossuary and therefore has CHVI; human remains have been documented extensively on the site. Since previous archaeological assessments of the site have been focused and of limited scope, they have not fully characterized the complete nature and extent of its archaeological deposits.

3.2.7 Cultural Heritage Resources

3.2.7.1 Cultural Heritage Screening

As described in Section 3.1.7, ASI undertook a screening of cultural heritage resources in the study area. ASI identified the following CHRs within the portion of the study area associated with GO Stations:

- 2 Potential PHPs, as follows:
  - Maple GO Station (Mile 18.28); and
  - Newmarket GO Station/Tannery Mall (Mile 34.35).
- 8 CHPs, as follows:
  - 7 residential properties along Franklin Street in Newmarket; and
  - Former Allandale Train Station (Mile 63.00).
- 1 Adjacent CHR, as follows:
  - Maple Village Heritage Conservation District (HCD), Designated Part V of the OHA (Mile 18.10-18.30).
- One Known PHP which had been identified under a previous Metrolinx project, as follows:
  - Bradford GO Station (MHC Decision Form, August 14, 2014) (Mile 14.60).
- One Known PHPPS, as follows:
  - Aurora GO Station, PHPPS (Mile 29.90).

The CHSR also included a preliminary review of the heritage attributes of each potential CHR and an initial assessment of effects. The screening resulted in one of four outcomes for the assessed CHRs, as follows:

- Where a property was deemed a Non-heritage Property, it was eliminated from further review;
- Where it was clear that no heritage attributes would be affected, the CHR was also eliminated from further review;
- Where there was likelihood that the heritage attributes could be directly affected, CHERs were completed to further confirm the heritage value of the Potential PHPs and CHPs, as documented in Section 3.2.7.2 and in Appendix E of this EPR; and
- Where there was potential for heritage attributes to be indirectly affected, CHERs were not immediately completed; however, the property was flagged for further assessment during detailed design or prior to Project construction. Further details are provided in Section 4.4.4.

Table 3-60 summarizes the outcome of the screening.

3.2.7.2 Cultural Heritage Evaluation

Five CHERs were prepared 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 MTCS Standards and Guidelines (2010). In addition, the CHERs were prepared according to the Metrolinx Draft Terms of Reference for Consultants: Cultural Heritage Evaluation Report and Cultural Heritage Evaluation Report Recommendations. CHERs were prepared for five CHPs which were identified through the screening as potentially being directly affected by the Project. Further details regarding impacts are provided in Section 4.4.4.

Table 3-60 further identifies the properties for which CHERs were completed and the outcome of that process. CHERs are provided in Appendix E. Of the five CHPs which were subject to a CHER, one was found to meet the criteria under O. Reg. 9/06, as follows:

- 91 Franklin Street (Mile 34.44).

None of the properties evaluated were found to meet the criteria under O. Reg. 10/06.

Table 3-60: Summary of Cultural Heritage Screening Outcomes – GO Station Improvements

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Cultural Heritage Screening Report Outcome	Cultural Heritage Evaluation Report Outcome[1,2]
City of Vaughan						
N/A	18.10-18.30	Maple Village Heritage Conservation District (HCD)	N/A	Designated Part V OHA (By-law 167-2007)	Adjacent	CHER not completed to date.
VA-06	18.28	Maple GO Station	30 Station Street	Part of the Maple Village HCD; Listed on the City of Vaughan Heritage Inventory	Potential PHP	PHP CHER completed as part of the GO Rail Network Electrification TPAP (MHC Decision Form, January 11, 2017)
Town of Aurora						
AU-04	29.90	Aurora GO Station	121/135 Wellington Street East	PHPPS; Listed on the Town of Aurora's Heritage Inventory	PHPPS CHER previously completed (MHC Decision Form August 14, 2014) Heritage Impact Assessment (HIA)/Strategic Conservation Plan Recommended	CHER not required.
Town of Newmarket						
NE-07	34.35	Newmarket GO Station/ Tannery Mall	465 Davis Drive	Listed, Town of Newmarket's Heritage Register	Potential PHP	PHP (Conditional) Meets criteria in O.Reg. 9/06. CHER completed as part of the GO Rail Network Electrification TPAP (MHC Decision Form, September 23, 2016).
NE-08	34.35	Residence - 2	33 Franklin Street	None	CHP	Non-heritage property. CHER completed for BRCE. Does not meet criteria in O.Reg. 9/06 or 10/06.
NE-09	34.37	Residence - 3	37 Franklin Street	None	CHP	Non-heritage property. CHER completed for BRCE. Does not meet criteria in O.Reg. 9/06 or 10/06.
NE-10	34.39	Residence - 4	43 Franklin Street	None	CHP	Non-heritage property. CHER completed for BRCE. Does not meet criteria in O.Reg. 9/06 or 10/06.
NE-11	34.41	Residence - 5	47 Franklin Street	None	CHP	Non-heritage property. CHER completed for BRCE. Does not meet criteria in O.Reg. 9/06 or 10/06.
NE-12	34.43	Residence - 6	71 Franklin Street	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
NE-13	34.44	Residence - 7	91 Franklin Street	None	CHP	PHP (Conditional) CHER completed for BRCE. Meets criteria in O.Reg. 9/06.

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Cultural Heritage Screening Report Outcome	Cultural Heritage Evaluation Report Outcome[1,2]
NE-14	34.46	Residence - 8	95 Franklin Street	None	CHP. No further review required as part of the BRCE Project.	CHER not required.
Town of Bradford West Gwillimbury						
BR-02	41.60	Bradford GO Station	31 Dissette Street	PHP	PHP CHER previously completed (MHC Decision Form August 14, 2014) HIA/Strategic Conservation Plan Recommended	CHER not required.
City of Barrie						
BA-04	63.00	Former Allandale Train Station	285 Bradford Street	Heritage Easement	CHP	CHER not completed to date.

[1] Several CHERs were completed subsequent to the CHSR as part of the GO Rail Network Electrification TPAP. The outcomes of these are included where they relate to potential CHRs in the BRCE study area.
[2] The outcome presented reflects the decision of the MHC.

In accordance with Table 3-60, the following CHRs are present within the study area and have the potential to be impacted by the BRCE Project:

- PHPPS:
  - Aurora GO Station (Mile 29.90).
- PHPs:
  - Maple GO Station (Mile 18.28); and
  - Bradford GO Station (Mile 41.60).
- Conditional PHPs:
  - Newmarket GO Station/Tannery Mall (Mile 34.35); and
  - 91 Franklin Street, Newmarket (Mile 34.44).
- Adjacent:
  - Maple Village Heritage Conservation District (HCD), Designated Part V of the OHA (Mile18.10-18.30).
- CHP:
  - Former Allandale Train Station (Mile 63.00).

These CHRs are shown on Figure 3-5 and are further assessed for potential effects in Section 4.4.4 of this Report.

3.2.8 Socio-Economic Environment and Land Use

3.2.8.1 Land Use in the City of Toronto

No GO Station improvements are planned in the City of Toronto for the BRCE Project.

3.2.8.2 Land Use in York Region

Land uses in York Region are summarized by lower-tier municipality in the following sections.

City of Vaughan

The existing Rutherford and Maple GO Stations are planned for improvements as part of the BRCE Project. There are currently a variety of residential, open space and industrial uses adjacent to the Rutherford GO Station and residential, vacant lands and the Maple United Church Cemetery in the vicinity of the Maple GO Station.

The City of Vaughan has prepared a number of Secondary Plans which plan for new growth and development. Three are relevant to the GO Station areas and are described below.

The Maple GO Station Secondary Plan (City of Vaughan, 2014) addresses land use in the immediate vicinity of the Maple GO Station. Lands are currently vacant but are scheduled for “Mid-rise Mixed Use” which is planned to include residential uses, retail and office uses and community facilities, among others.

The Rutherford GO Station Area was identified by Urban Strategies Inc. (2009) as a valuable area for intensification. No Secondary Plan has been prepared to date; however, it is anticipated that future land use could include a variety of mixed uses at a greater density than that which currently exists.

Township of King

The King City GO Station is located adjacent to commercial lands to the east and open space lands to the west. The open space lands are part of the provincially significant King-Vaughan Wetland Complex. No future development is proposed adjacent to the station due to the protection associated with the PSW.

Town of Aurora

The Aurora GO Station is located centrally within the Town of Aurora downtown core. Surrounding lands include a variety of residential and commercial uses. The Aurora Promenade Secondary Plan and CIP Area encompasses the downtown core and includes the GO Station and its vicinity. The intent of the Plan is to create a vibrant downtown with shopping, living and entertainment uses. The Plan encourages walking and bicycling as transportation options. The Plan includes a Streetscape Design and Implementation Plan.

During a meeting on April 28, 2016, Town staff noted that a new development is proposed south of the existing GO Station parking lot. The development is in an early planning stage and may include a low-rise condominium or other residential development.

Town of Newmarket

The Newmarket GO Station is located adjacent to residential and commercial land uses. The Mabel Davis Conservation Area and Nokiidaa Bike Trail are also in close proximity. The Town of Newmarket has prepared a Draft Secondary Plan for its urban centres, including the Davis Drive core which is bisected by the Barrie rail corridor and includes the Newmarket GO Station. Land use in the vicinity of the GO Station is expected to intensify in the future and will include a variety of mixed uses. Future development will include increased residential development, commercial relocations and parking lot expansions.

Town of East Gwillimbury

The East Gwillimbury GO Station is currently surrounded by agricultural lands to the west, south and north and recreational lands to the east. Recreational lands include the Nokiidaa Bike Trail. The Town of East Gwillimbury has prepared a Draft Secondary Plan for the Green Lane area (Town of East Gwillimbury, 2014). The Plan area is bisected by the Barrie rail corridor and includes the East Gwillimbury GO Station. The proposed development pattern for the area is intended to be designed such that it provides “convenient access to the East Gwillimbury GO Station” (Section 10 (a)). A new east-west collector road is proposed to cross the corridor to the north of the existing East Gwillimbury GO Station.

3.2.8.3 Land Use in the County of Simcoe

Land uses in the County of Simcoe are summarized by lower-tier municipality in the following sections.

Town of Bradford West Gwillimbury

Lands surrounding the Bradford GO Station are comprised of industrial, institutional, residential and agricultural uses. A portion of the Holland Marsh Specialty Crop Area, identified in the Greenbelt Plan is located to the south of the station. No significant changes in land use are proposed in the near future.

Town of Innisfil

No GO Station improvements are planned in the Town of Innisfil for the BRCE Project.

3.2.8.4 *Land Use in the City of Barrie*

The Barrie South and Allandale Waterfront GO Stations are planned for improvements as part of the BRCE Project. The Barrie South GO Station is located in the rural southern portion of the City. Lands surrounding the station are a mix of open space, agricultural and residential. This area is proposed for significant future growth. A new subdivision, known as the Mapleview Development is located to the west of the Barrie South GO Station. The development includes approximately 1,241 residential units, comprised of apartment buildings and townhouses. The draft plan identifies a trail connection to the Barrie South GO Station.

The Allandale Waterfront GO Station is in the downtown core of the City and adjacent lands include residential properties and recreational areas, including waterfront parklands, trails and the historic Allandale Station.

The City's downtown core is identified as an "Urban Growth Centre" and includes a target of 150 persons and jobs/hectare. The entire Urban Growth Centre is in close proximity to the Allandale Waterfront GO Station. As a result of these targets, development is expected to intensify; however the type of land use is not expected to change significantly (e.g., existing urban lands will remain urban with a greater level of intensification, that is, increased density levels).

3.2.9 *Air Quality*

Section 3.1.9 of this EPR provides a summary of the existing air quality conditions within the BRCE study area. The five representative rail segments selected for the BRCE study area include the area around the King City GO Station extending north and south (Segment C), the area around the Bradford GO Station extending north and south (Segment D) and the area around the Allandale Waterfront GO Station extending south (Segment E).

In summary, existing "Future No Build" air quality concentrations for acrolein and NO_2 do not exceed applicable criteria. Benzene and $PM_{2.5}$ concentrations for the "Future No Build" scenario occasionally exceed applicable criteria. B(a)P concentrations in the "Future No Build" air quality conditions regularly exceed applicable criteria; however, in some cases, the background levels of B(a)P exceed the applicable criteria, which is common across Canada in urban areas. Sensitive receptors in the vicinity of GO Stations will experience higher increases in concentration of B(a)P. The concentration of B(a)P decreases as the distance to from the rail corridor to the sensitive receptor increases.

3.2.10 *Noise*

The noise assessment methodology, criteria, inputs, and other relevant noise information is summarized in Section 3.1.10 of this EPR and is more thoroughly detailed in the Noise and Vibration Impact Assessment, provided in Appendix H of this EPR.

GO Trains were assumed to idle for 1.5 minutes at each station in the corridor for Existing, Future, Scenario 1 and Future, Scenario 2 operations. The noise modelling results for the rail corridor included representative receptors of the existing GO Stations and were previously identified in Table 3-50 in Section 3.1.10. These results are discussed further in Section 4.4.7 of this EPR. The modelling results and assessment are documented in further detail in the Noise and Vibration Impact Assessment.

3.2.11 *Vibration*

Vibration velocity was assessed at the sensitive areas within 75 metres of the existing GO Stations. The representative sensitive receptors were identified previously in Table 3-52 in Section 3.1.11.

3.2.12 *Traffic and Transportation Infrastructure*

An overview of traffic and transportation infrastructure that could be impacted by the GO Station improvements is provided below. Road traffic operations are also identified for each GO Station. Further details for each GO Station, including parking, active transportation, local and regional transit, and other traffic considerations are provided in the TIA which is provided in Appendix I of this EPR. The TIA includes further details on the proposed Caledonia and Downsview Park GO Stations (assessed as part of other Metrolinx projects under separated EAs) and the existing York University GO Station. These GO Stations are not discussed further within this section as there are no proposed station improvements for these locations as part of the BRCE Project.

The assessment of the traffic operations at the key intersections and GO Station accesses follows the methodologies set out in the Highway Capacity Manual (HCM). The HCM defines the Level of Service (LOS) for signalized and unsignalized intersections as a function of the average vehicle control delay. LOS may be calculated per movement (e.g., turning movements or through movements) or per approach for any intersection configuration, but LOS for the intersection as a whole is only defined for signalized and all-way stop configurations. The HCM LOS definitions are summarized below in Table 3-61.

Table 3-61: Level of Service Definitions

Level of Service	Signalized Intersection Average Vehicle Control Delay	Unsignalized Intersection Average Vehicle Control Delay	Traffic Operations
A	≤10 seconds	≤10 seconds	Acceptable
B	10-20 seconds	10-15 seconds	Acceptable
C	20-35 seconds	15-25 seconds	Acceptable
D	35-55 seconds	25-35 seconds	Somewhat undesirable, congested
E	55-80 seconds	35-50 seconds	Undesirable, congested[1]
F	≥80 seconds	≥50 seconds	Unacceptable, very congested[1]

[1] *Turning movements with undesirable traffic operations are also identified as "critical movements" in this EPR.*

The assessment of traffic operations at intersections also considered the volume/capacity (v/c) ratios, for traffic movements and for the intersections as a whole. Traffic movements that have a v/c ratio of >1.0 are considered "over capacity" and would require consideration of improvements to provide additional capacity at the intersection (e.g., addition of lanes and/or upgrading/adjustment to traffic controls).

At signalized intersections the queuing was reviewed, taking into consideration the 95th percentile queue and the available queue space to accommodate the various traffic movements.

3.2.12.1 *Rutherford GO Station*

Traffic and Transportation Infrastructure

There are improvements proposed at the Rutherford GO Station as part of Phase One of the BRCE Project, to support the service expansion associated with the GO Expansion program over the next ten years. Details regarding the concept plan were previously provided in Section 2.2.2 of this EPR.

Road access to the Rutherford GO Station is via a signalized driveway on the south side of Rutherford Road, located about 160 metres to the east of the intersection of Rutherford Road/Westburne Drive/Barrhill Road. This access is for the bus loop and Kiss & Ride only. In addition there are two driveway accesses on the east side of Westburne Drive, located 140 metres and 190 metres to the south of the intersection of Rutherford Road/Westburne Drive/Barrhill Road.

In general, the study area for review of potential traffic effects in the TIA is bounded by:

- North - Rutherford Road;
- East - North GO Station Access and Kiss & Ride;
- South - GO Station Access South; and
- West - Westburne Drive and Barrhill Road.

Within the study area, the road network includes:

- Rutherford Road - major arterial running east-west, with four basic lanes (two in each direction);
- Barrhill Road - major collector road running north-south, with two basic lanes; and
- Westburne Drive - major collector road running north-south, with two basic lanes.

All roads in the study area are under the City of Vaughan's jurisdiction. The posted speeds on the roads in the study area are 50 km/h, with the exception of Rutherford Road, which is 60 km/h.

To confirm traffic operations and the potential to affect access or to be affected by operations of the Rutherford GO Station, the following main intersections have been identified for analysis in the TIA.

- Rutherford Road/GO Access Bus Loop + Kiss & Ride;
- Rutherford Road/Barrhill Road and Westburne Drive;
- Westburne Drive/GO Station Access North; and
- Westburne Drive/GO Station Access South.

The York Region intends to widen Rutherford Road to include an additional High Occupancy Vehicle (HOV)/Transit Priority lane in each direction in this area.

Traffic Operations

Existing traffic volumes at the intersections in the study area are provided in the TIA.

The LOS, delays, v/c ratios and queuing at the intersections within the study area of the Rutherford GO Station, were analyzed using Synchro software. The traffic operations for these intersections are summarized in the TIA (provided in Appendix I of this EPR), and traffic movements that are over capacity or reaching unacceptable delays have been identified. Based on this analysis, the following observations were made regarding existing traffic operations:

- The Rutherford Road/Barrhill Road/Westburne Drive intersection operates with unacceptable delays and v/c ratios in the A.M. and P.M. Peak Hours for several movements;
- The Westburne Drive / GO Station Access North intersection operates with unacceptable delays during the A.M. Peak Hour for the westbound left turn movement; and
- The Westburne Drive / GO Station Access South intersection operates with a critical movement during the A.M. Peak Hour for the westbound left movement;

It was determined that the following intersections operate acceptably:

- The Rutherford Road/GO Access Loop + Kiss & Ride.
- There is deficient queue storage at the following intersections:
- The Rutherford Road/GO Access Loop + Kiss & Ride (northbound left movement); and
- The Barrhill Road/Westburne Drive/Rutherford Road (eastbound right, westbound left, northbound left and southbound left movements).

3.2.12.2 *Maple GO Station*

Traffic and Transportation Infrastructure

There are improvements proposed at the Maple GO Station as part of the Phase One of the BRCE Project, to support the service expansion associated with the GO Expansion program over the next ten years. The concept plan was previously provided in Section 2.2.3 of this EPR.

Road access to the Maple GO Station is via two driveways on the north side of Hill Street, one driveway on the south side of Eagle Rock Way and one driveway (right-out only) on the south side of McNaughton Road East.

In general, the study area for review of potential traffic effects as part of the TIA is bounded by:

- North - McNaughton Road;
- East - McNaughton Road and Peter Rupert Avenue;
- South - Major Mackenzie Drive West; and
- West - Keele Street.

Within the study area, the road network includes:

- Major Mackenzie Drive West - major arterial running east-west, with four basic lanes (two in each direction);
- Keele Street - major arterial running north-south, with four basic lanes (two in each direction);
- McNaughton Road - minor arterial running east-west, with four basic lanes (two in each direction);
- Railway Street - minor collector running east-west with two basic lanes;
- Killian Road - minor collector running east-west with two basic lanes; and

- Peter Rupert Avenue - minor collector running north/south with two basic lanes.

All other roads in the study area are classified as local roads. In addition, all roads in the study area are under the City of Vaughan's jurisdiction. The posted speeds on the roads in the study area are 50 km/h, with the exception of Killian Road, which is 40 km/h.

To confirm traffic operations and the potential to affect access or operations of the Maple GO Station, the following main intersections were identified for analysis in the TIA:

- Keele Street/McNaughton Road;
- Keele Street/Killian Road and Railway Street;
- McNaughton Road/GO Station Access;
- McNaughton Road/Rodinea Road and Troon Avenue;
- McNaughton Road/Eagle Rock Way;
- McNaughton Road and Peter Rupert Avenue/Major Mackenzie Drive West; and
- Major Mackenzie Drive West/Hill Street.

Traffic Operations

Existing traffic volumes at the intersections in the study area are provided in the TIA contained in Appendix I of this EPR.

The LOS, delays, v/c ratios and queuing at the intersections within the study area of the Maple GO Station, were analyzed using Synchro software. The traffic operations for these intersections are summarized in the TIA, and traffic movements that are over capacity or reaching unacceptable delays have been identified. Based on this analysis, the following observations were made regarding existing traffic operations:

- The McNaughton Road/Troon Avenue/Rodinea Road intersection operates with high delays on its minor road approaches;
- The McNaughton Road/Eagle Rock Way intersection operates with high delays for the eastbound left-turn movement only; and
- The Major Mackenzie Drive West/Peter Rupert Avenue/McNaughton Road intersection operates with high delays and v/c ratios. Critical movements include the southbound left and westbound left movements.

It was determined that the following intersections operate acceptably:

- McNaughton Road/GO Station Access intersection;
- Major Mackenzie Drive West/Hill Street intersection;
- Keele Street/Killian Road/Railway Street intersection; and
- There is deficient queue storage at the following intersections:
- Major Mackenzie Drive West/McNaughton Road/Peter Rupert Avenue (westbound left and northbound left turn movements);
- Major Mackenzie Drive West/Hill Street (eastbound left turn movement); and
- Keele Street/Killian Road/Railway Street (eastbound left turn movement).

3.2.12.3 King City GO Station

Traffic and Transportation Infrastructure

There are improvements proposed at the King City GO Station as part of Phase One of the BRCE Project, to support the service expansion associated with the GO Expansion program over the next ten years. Details regarding the concept plan were previously provided in Section 2.2.4 of this EPR.

Due to space limitations, it will be necessary to remove some of the existing parking to accommodate the track/platform expansion.

Road access to the King City GO Station is currently via a driveway on the west side of Keele Street, located about 150 metres to the south of the intersection of Keele Street/Station Road. A second driveway to the GO Station is located on the south side of Station Road, about 68 metres to the west of the intersection of Keele Street/Station Road. Two GO Station parking lots are also accessed by additional driveways on the north and south sides of Station Road, located about 125 metres to the west of the intersection of Keele Street/Station Road. A future parking lot is proposed to be accessed via an additional driveway on the south side of Station Road, further to the west (55 Station Road). A future driveway may also be developed on the west side of Keele Street, opposite to Sculptors Gate.

In general, the study area for review of potential traffic effects in the TIA is bounded by:

- North - Station Road;
- East - Keele Street;
- South - Proposed new GO Station Driveway; and
- West - West Street (potential future GO Parking).

Within the study area, the road network includes:

- Station Road - collector road running east-west, with two basic lanes;
- Keele Street - major arterial road running north-south, with four basic lanes (two in each direction); and
- King Road - major arterial road running east-west, with four basic lanes (two in each direction).

All other roads in the study area are classified as local roads. Station Road is under the jurisdiction of the Township of King, while Keele Street and King Road are under the jurisdiction of York Region. The posted speeds on the roads in the study area are 50 km/h, with the exception of Station Road and Burton Grove, which are both 40 km/h.

To confirm traffic operations and the potential to affect access or to be affected by operations of the King City GO Station, the following main intersections were identified for analysis in the TIA:

- King Road/Keele Street;
- Station Road/GO Access North and GO Access South;

- Station Road/GO Station Access;
- Station Road/Burton Grove/Keele Street;
- Keele Street/GO Station Driveway; and
- Keele Street/Sculptors Gate/New GO Station Driveway.

Traffic Operations

Existing traffic volumes at the intersections in the study area are provided in the TIA which is located in Appendix I of the EPR.

The LOS, delays, v/c ratios and queuing at the intersections within the study area of the King City GO Station, were analyzed using Synchro software. The traffic operations for these intersections are summarized in the TIA (Appendix I of this EPR), and critical movements (e.g., traffic movements that are over capacity or reaching unacceptable delays) have been identified. Based on this analysis, the following observations were made regarding existing traffic operations:

- All intersections in the study area operate acceptably; and
- There is deficient queue storage for the westbound left movement at the King Road/Keele Street intersection.

3.2.12.4 Aurora GO Station

Traffic and Transportation Infrastructure

This station has been renovated within the past five years to include a new bus loop, new Kiss & Ride facilities, new promenade area, upgraded station building and parking structure. In addition, further station improvements are proposed at the Aurora GO Station as part of Phase One of the BRCE Project, to support the service expansion associated with the GO Expansion program over the next ten years. Details regarding the concept plan were previously provided in Section 2.2.5 of this EPR.

Due to space limitations, it will be necessary to remove some of the existing parking to accommodate the track/platform expansion.

Road access to the Aurora GO Station is via the following:

- Two driveway accesses from Industrial Parkway South;
- Right in/right out access to the parking structure on Wellington Street East;
- Driveway access from Wellington Street (formerly Ross Street); and
- Three driveway accesses from Berczy Street.

In general, the study area for review of potential traffic effects in the TIA is bounded by:

- North - Wellington Street East;
- East - Industrial Parkway South;
- South - Industrial Parkway South; and
- West - Yonge Street.

Within the study area, the road network includes:

- Yonge Street - arterial road running north-south, with four basic lanes (two in each direction). The right lane in both the northbound and southbound direction is used for parking between 9:00 A.M. to 4:30 P.M. Monday to Saturday;
- Wellington Street East/West - arterial road running east-west, with four basic lanes (two in each direction) from the Industrial Parkway intersection to the east. West of the Industrial Parkway intersection, Wellington Street tapers from four to two lanes; and
- Industrial Parkway South - collector road running north-south with two basic lanes.

All other roads in the study area are classified as local roads. Yonge Street and Industrial Parkway South are under the jurisdiction of the Town of Aurora, while Wellington Street East/West is under the jurisdiction of York Region. The posted speeds on the roads in the study area are 50 km/h.

To confirm traffic operations and the potential to affect access or to be affected by operations of the Aurora GO Station, the following main intersections were identified for analysis in the TIA:

- Wellington Street West/Wellington Street East/Yonge Street;
- Wellington Street East/Berczy Street;
- Wellington Street East/GO Station Access (Ross Street);
- Wellington Street East/GO Access Garage;
- Wellington Street East/Industrial Parkway South; and
- Industrial Parkway South/GO Access South.

Traffic Operations

Existing traffic volumes at the intersections in the study area are provided in the TIA contained in Appendix I of this EPR.

The LOS, delays, v/c ratios and queuing at the intersections within the study area of the Aurora GO Station, were analyzed using Synchro software. The traffic operations for these intersections are summarized in the TIA, and critical movements (e.g., traffic movements that are over capacity or reaching unacceptable delays) have been identified. Based on this analysis, the following observations were made regarding existing traffic operations:

- The Wellington Street East/Berczy Street intersection has a critical movement for the northbound left movement;
- The Wellington Street East / Industrial Parkway North / Industrial Parkway South intersection operates with a high v/c ratio. Both the Northbound Through and the Southbound left are unacceptable in existing conditions (2015) with high delays and high v/c ratios (P.M. Peak Hour);
- The Wellington Street East/GO Access (Ross Street) intersection operates with a critical movement; and
- It was determined that the following intersections operate acceptably:

- Wellington Street East/Yonge Street;
- Wellington Street East/GO Garage Access;
- Industrial Parkway South/Go Access South; and
- There are deficient queue storage lengths at the Wellington Street East and Industrial Parkway North/South intersection in the Westbound left, Northbound Left, and Southbound Left Lanes.

3.2.12.5 *Newmarket GO Station*

Traffic and Transportation Infrastructure

Station improvements at the Newmarket GO Station are not required as part of Phase One of the BRCE Project since Phase One does not include any additional tracks north of the Aurora GO Station. As additional funding becomes available from the Province, it is anticipated the next phase(s) will include a second track at the Newmarket GO Station. Details regarding the concept plan were previously provided in Section 2.2.6 of this EPR.

Road access to the Newmarket GO Station is via a signalized driveway on the north side of Davis Drive, located about 200 metres to the east of the intersection of Davis Drive/Main Street.

In general, the study area for review of potential traffic effects in the TIA is bounded by:

- North - Tom Taylor Trail and Nokiidaa Bike Trail;
- East - Lundys Lane and Prospect Street;
- South - Davis Drive; and
- West - Main Street North.

Within the study area, the road network includes the following:

- Davis Drive - arterial road running east-west, with four basic lanes plus two rapid transit bus lanes;
- Main Street North - primary collector road running north-south, with two basic lanes, each lane; and
- Prospect Street - primary collector road running north-south, with one southbound lane including on-street parking, one northbound lane, and one centre lane (for left turns).

It is noted that Main Street North is under the jurisdiction of the Town of Newmarket, while Davis Drive and Prospect Street are under the jurisdiction of York Region. The posted speeds on the roads in the study area are 50 km/h, with the following exceptions:

- Davis Drive - 60 km/h; and
- Main Street North - 40 km/h.

To confirm traffic operations and the potential to affect access or to be affected by operations of the Newmarket GO Station, the following main intersections were identified for analysis in the TIA:

- Davis Drive/Main Street North;
- Davis Drive/Commercial Access and GO Station Access (The Tannery); and
- Davis Drive/Lundys Lane/Prospect Street.

Traffic Operations

Existing traffic volumes at the intersections in the study area are detailed in the TIA provided in Appendix I of this EPR.

The LOS, delays, v/c ratios and queuing at the intersections within the study area of the Newmarket GO Station, were analyzed using Synchro software. The traffic operations for these intersections are summarized in the TIA, and critical movements (e.g., traffic movements that are over capacity or reaching unacceptable delays) have been identified. Based on this analysis, the following observations were made regarding existing traffic operations:

- The only movement in the study area that had an unacceptable delay and v/c ratio was the northbound through movement at the Davis Drive and Main Street intersection. However, the existing conditions analysis was based on the conditions that existed prior to the implementation of the BRT in the study area;
- It was determined that the following intersections operate acceptably:
- GO Access / Commercial Access / Davis Drive;
- Davis Drive / Lundys Lane / Prospect Street; and
- There is deficient queue storage at the following intersections:
- GO Access/Commercial Access/Davis Drive (southbound left movement);and
- Davis Drive/Lundys Lane/Prospect Street (northbound left movement).

3.2.12.6 *East Gwillimbury GO Station*

Traffic and Transportation Infrastructure

During Phase One of the BRCE Project, no improvements are required at the East Gwillimbury GO Station since Phase One does not include any additional tracks north of the Aurora GO Station. As additional funding becomes available from the Province, it is anticipated the next phase(s) will include a second track at the East Gwillimbury GO Station. Details regarding the concept plan were previously provided in Section 2.2.7 of this EPR.

Road access to the East Gwillimbury GO Station is via a signalized driveway on the south side of Green Lane, located about 205 metres to the east of the intersection of Main Street North/2nd Concession Road/Green Lane.

In general, the study area for review of potential traffic effects in the TIA provided in Appendix I of this EPR is bounded by:

- North - Green Lane East;
- East - GO Station Access;
- South - Future Development Lands; and
- West - Main Street North/2nd Concession Road.

Within this study area, the road network includes:

- Green Lane East - arterial road running east-west, with four basic lanes (two in each direction);
- Concession Road 2 - arterial road running north-south, with two basic lanes (four basic lanes currently under construction); and

- Main Street North - arterial road running north-south, with two basic lanes.

It is noted that Green Lane and Concession Road 2 are under the jurisdiction of York Region, while Main Street North is under the jurisdiction of the Town of East Gwillimbury. The posted speeds on the roads in the study area are 50 km/h, with the exception of Green Lane East, which is 80 km/h.

To confirm traffic operations and the potential to affect access or to be affected by operations of the East Gwillimbury GO Station, the following main intersections were identified for analysis in the TIA:

- Green Lane East/Main Street North/Concession Road 2; and
- Green Lane East/GO Station Access/Private Drive.

Traffic Operations

Existing traffic volumes at the intersections in the study area are provided in the TIA (Appendix I of this EPR).

The LOS, delays, v/c ratios and queuing at the intersections within the study area of the East Gwillimbury GO Station, were analyzed using Synchro software. The traffic operations for these intersections are summarized in the TIA, and critical movements (e.g., traffic movements that are over capacity or reaching unacceptable delays) have been identified. Based on this analysis, the following observation was made regarding existing traffic operations:

- The Concession Road 2/Main Street North/Green Lane East intersection operates with high delays and deficient queue storage; and
- The Green Lane East/Private Drive/GO Station Access intersection operates acceptably.

3.2.12.7 Bradford GO Station

Traffic and Transportation Infrastructure

No improvements are required at the Bradford GO Station as part of Phase One of the BRCE Project as no additional tracks north of the Aurora GO Station are required as part of Phase One. As additional funding becomes available from the Province, it is anticipated the next phase(s) will include a side platform at the existing second track at the Bradford GO Station. Details regarding the concept plan were previously provided in Section 2.2.8 of this EPR.

It will be necessary to remove some of the existing parking to accommodate the track/platform expansion, due to space limitations. However, a minor parking expansion is proposed in advance of the BRCE Project which will more than offset the lost parking spaces (total spaces to be increased from 377 to 398).

Road access to the Bradford GO Station is via a north access, from Dissette Street, and a south access, from Bridge Street. The north access is located about 210 metres to the north of the intersection of Dissette Street/Bridge Street, while the south access is located about 105 metres to the east of this intersection.

In general, the study area for review of potential traffic effects in the TIA is bounded by:

- North - GO Station Access (North);
- East - GO Station Access (South);
- South - Bridge Street and Holland Street East; and
- West - Dissette Street.

Within the study area, the road network includes:

- Bridge Street - arterial road running east-west, with six lanes, two basic through lanes eastbound and westbound, and an additional right and left-turn lane in the westbound direction;
- Holland Street East - arterial road running east-west, with five lanes, two basic through lanes eastbound and westbound, and an additional left-turn lane in the eastbound direction; and
- Dissette Street - arterial road running north-south, with five lanes, two basic through lanes in the northbound direction, travelling southbound, there is one right-turn lane, one left-turn lane, and one through/left-turn lane (through movement to access commercial building opposite the intersection).

All roads in the study area are under the jurisdiction of the Town of Bradford West Gwillimbury. The posted speeds on the roads in the study area are 50 km/h.

To confirm traffic operations and the potential to affect access or to be affected by operations of the Bradford GO Station, the following main intersections were identified for analysis in the TIA:

- Dissette Street/GO Station Access (North)/Commercial Access;
- Dissette Street/Southeast Arterial Roadway/Holland Street East and Bridge Street; and
- Bridge Street/GO Station Access (South).

Future lane configuration changes at the intersections are proposed to accommodate the future Southeast Arterial Roadway that is proposed to intersect at the intersection of Holland Street East/Bridge Street/Dissette Street.

Traffic Operations

Existing traffic volumes at the intersections in the study area are provided in the TIA (Appendix I of this EPR).

The LOS, delays, v/c ratios and queuing at the intersections within the study area of the Bradford GO Station, were analyzed using Synchro software. The traffic operations for these intersections are summarized in the TIA, and critical movements (e.g., traffic movements that are over capacity or reaching unacceptable delays) have been identified. Based on this analysis, the following observations were made regarding existing traffic operations:

- The Dissette Street/GO Station Access North/Commercial Access North intersection operates with significant delays during the P.M. Peak Hour;
- The Dissette Street/Holland Street East/Bridge Street/Commercial Access South intersection operates with significant delays during the A.M. Peak Hour;
- The Bridge Street/GO Station Access South/Wendy's Restaurant Access intersection operates acceptably; and
- There is deficient queue storage at Dissette Street/Holland Street East/Bridge Street/ Commercial Access South intersection (westbound right and southbound left movements).

3.2.12.8 *Barrie South GO Station*

Traffic and Transportation Infrastructure

Station improvements at the Barrie South GO Station are not required as part of Phase One of the BRCE Project as Phase One does not include any additional tracks north of the Aurora GO Station. As additional funding becomes available from the Province, it is anticipated that the next phase(s) will include a second track at the Barrie South GO Station. Details regarding the concept plan were previously provided in Section 2.2.9 of this EPR.

Road access to the Barrie South GO Station is via a signalized driveway on the east side of Yonge Street, located about 300 metres to the north of the intersection of Yonge Street/Mapleview Drive.

In general, the study area for review of potential traffic effects in the TIA is bounded by:

- North - GO Station Access;
- East - St. Paul's Crescent;
- South - Mapleview Drive East; and
- West - Yonge Street.

Within this study area, the road network includes:

- Yonge Street - arterial road running north-south, with five lanes, two basic through lanes in both the northbound and southbound directions, as well as one left-turn lane in both the northbound and southbound directions; and
- Mapleview Drive East - arterial road running east-west, with five lanes. On the east leg of the intersection there is one basic eastbound through lane, two basic westbound through lanes, one westbound right-turn lane, one westbound left-turn lane, and bicycle lanes (both sides of the road). On the west leg of the intersection, there are two basic westbound through lanes, one basic eastbound through lane, one eastbound left-turn lane, and one eastbound right-turn lane.

All other roads in the study area are classified as local roads. It is noted that all roads in the study area are under the jurisdiction of the City of Barrie. The posted speeds on the roads in the study area are 50 km/h, with the exception of Yonge Street, which is 60 km/h.

To confirm traffic operations and the potential to affect access, or to be affected by operations of the Barrie South GO Station, the following main intersections have been identified for analysis in the TIA:

- Yonge Street/Mapleview Drive East; and
- Yonge Street/GO Station Access.

Traffic Operations

Existing traffic volumes at the intersections in the study area are provided in the TIA (Appendix I of this EPR).

The LOS, delays, v/c ratios and queuing at the intersections within the study area of the Barrie South GO Station, were analyzed using Synchro software. The traffic operations for these intersections are summarized in the TIA, and critical movements (e.g., traffic movements that are over capacity or reaching unacceptable delays) have been identified. Based on this analysis, it was observed that both intersections in the study area operate with acceptable delays, capacities, and queues in existing conditions.

3.2.12.9 *Allandale Waterfront GO Station*

Traffic and Transportation Infrastructure

Station improvements at the Allandale Waterfront GO Station are not required as part of the first phase of the BRCE Project as Phase One does not include any additional tracks north of the Aurora GO Station. As additional funding becomes available from the Province, it is anticipated that the next phase(s) will include a second track to the Allandale Waterfront GO Station. However, two tracks currently exist in the area of the Allandale Waterfront GO Station itself and therefore improvements at this station will only include a new platform and shelters along the south side of these tracks. Details regarding the concept plan of the station improvements to accommodate the operations on the second track were previously provided in Section 2.2.10 of this EPR.

Road access to the Allandale Waterfront GO Station is via a north access (Lakeshore Drive/Tiffin Street), an east access (Lakeshore Drive) and a west access (inbound buses only). In addition, access to the GO Station parking area located along Gowan Street, is via Gowan Street.

In general, the study area for review of potential traffic effects in the TIA is bounded by:

- North - Tiffin Street and Lakeshore Drive;
- East - GO Station Access East;
- South - Gowan Street; and
- West - Essa Road and Bradford Street.

Within this study area, the road network includes:

- Tiffin Street - a four lane arterial road running east-west. In the eastbound direction, there is one basic lane and one left-turn lane, while in the westbound direction, there is one basic through lane and one right-turn lane (onto the channelization to transition onto Bradford Street);
- Essa Road - arterial road running north-south, with four basic lanes;
- Bradford Street - arterial road running north-south with five lanes. There are two basic lanes in the northbound direction. In the southbound direction, there is one basic through lane, one right-turn lane, and one left-turn lane;
- Lakeshore Drive - parkway road running east-west with five lanes. In the eastbound direction, there is one basic lane, while in the westbound direction, there are two basic through lanes, one right-turn lane, and one left-turn lane; and
- Gowan Street - minor collector with two basic lanes (one in each direction). There is also parking located immediately north of the road (GO Station parking).

All roads in the study area are under the jurisdiction of the City of Barrie. The posted speeds on the roads in the study area are 50 km/h.

To confirm traffic operations and the potential to affect access, or to be affected by operations of the Allandale

Waterfront GO Station, the following main intersections have been identified for analysis in the TIA:

- Lakeshore Drive/GO Station Access East;
- Lakeshore Drive/GO Station Access North;
- Tiffin Street/Bradford Street/Essa Road;
- Essa Road/GO Station Bus Access; and
- Essa Road/Gowan Street.

Traffic Operations

The existing traffic volumes at the intersections in the study area are provided in the TIA contained in Appendix I of this EPR.

The LOS, delays, v/c ratios, and queuing, for the existing and future conditions at the intersections within the study area of the Allandale Waterfront GO Station, were analyzed using Synchro software. The traffic operations for these intersections are summarized in the TIA, and critical movements (e.g., traffic movements that are over capacity or reaching unacceptable delays) have been identified. Based on this analysis, the following observations were made regarding existing traffic operations:

- All intersections in the study area operate with acceptable delays and capacities; and
- There is deficient queue storage at the following intersections:
  - Lakeshore Drive/Tiffin Street/GO Access(eastbound left and southbound left movements);and
  - Essa Road/Tiffin Street/Bradford Street intersection (westbound left movement).

3.2.13 *Utilities and Municipal Infrastructure*

An assessment of the utilities and municipal infrastructure at the GO Stations was conducted in conjunction with the assessment for the Barrie rail corridor expansion – that is, addition of new track through the GO Station areas. The following utilities and municipal infrastructure are located along or crossing the Barrie rail corridor at the GO Stations where improvements are proposed:

- Rutherford GO Station – Metrolinx signals infrastructure running parallel to the existing tracks;
- Maple GO Station – Bell and sanitary sewer crossing the existing tracks;
- King City GO Station – Metrolinx electrical infrastructure crossing and parallel to existing tracks;
- Aurora GO Station – Two storm sewers crossing the location of the proposed tracks and one overhead utility crossing the existing tracks;
- Newmarket GO Station – Metrolinx signals cross and run parallel to the existing rail ROW, while three sanitary and one watermain cross the rail ROW;
- East Gwillimbury GO Station – Metrolinx signals run parallel to the existing tracks;
- Bradford GO Station – A gas main and telecom cross the existing tracks;
- Barrie South GO Station – A storm sewer from the station's SWM pond crosses the existing tracks; and
- Allandale Waterfront GO Station – Two storm sewers cross and two storm sewer run parallel to the existing tracks, while a telecom and unknown utility cross the rail ROW.

3.3 Bradford Layover Facility

The existing conditions and features described in Section 3.1 above provide a general characterization across the BRCE Project. This section describes additional details regarding the existing conditions and features specifically within the study area of the Bradford Layover Facility.

3.3.1 *Physical Environment*

Details regarding the physical environment along the Barrie rail corridor were provided in Section 3.1.1 of this EPR. As such, further discussion of the physical environment is not repeated herein, as the following sections outline existing conditions specific to the proposed Bradford Layover Facility lands.

3.3.2 *Aquatic Environment*

A tributary of the West Holland River lies to the east of the layover site. This tributary outlets directly into the West Holland River. The main stem of the West Holland River, a large riverine habitat, is identified as having a warm water thermal regime and provides habitat to a diverse range of sportfish. Species primarily consist of bass, carp, sunfishes, and a range of minnows. Many of these species would also be found in the tributary.

3.3.3 *Terrestrial Environment*

The train layover site is located within the existing (and active) Artesian Industrial Park. As such, the entire site has previously been disturbed. Vegetation on site is limited to a cultural thicket and cultural meadow that have regenerated since the time of disturbance. A small mixed shallow aquatic community is also present as a result of development of the site. The wetland is square in shape and may have been created for stormwater management purposes or as a result of earth moving and grading for adjacent industrial lots. The features on the site provide limited ecological value. However, Significant Natural Areas are present to the east of the Barrie rail corridor and, due to the proximity of these features; wildlife may also inhabit on-site cultural communities. To the east is a large mixed swamp, part of the provincially significant Holland Marsh Wetland Complex. This PSW provides Significant and Candidate SWH for various bird, reptile and amphibian species, including several SAR.

3.3.4 *Tree Inventory*

Trees found within the area proposed for development of the Bradford Layover Facility are associated with landscaping and retained hedgerows adjacent to 75 Artesian Industrial Parkway and rear portions of undeveloped lands (eastward, adjacent the property limit shared with the existing rail corridor). Since property access was not available, an estimate of the total number of trees was carried out using existing site investigation data collected from the ROW near the Bradford Layover Facility supplemented with aerial photography interpretation, but tree species could not be confirmed.

3.3.5 *Significant Natural Features*

There are no significant natural features in the vicinity of the proposed Bradford Layover Facility.

3.3.6 *Archaeological Resources*

3.3.6.1 *Stage 1 Archaeological Assessment*

As illustrated in the Stage 1 Archaeological Assessment provided in Appendix C of this EPR, the footprint area of the proposed Bradford Layover Facility is considered "disturbed". This proposed site therefore does not exhibit archaeological potential.

3.3.7 Cultural Heritage Resources

3.3.7.1 Cultural Heritage Screening

Through the CHSR, provided in Appendix D of this EPR, ASI identified a number of CHRs in the BRCE Project study area. None of the screened CHRs are located within, or adjacent to, the proposed location of the Bradford Layover Facility.

3.3.8 Socio-Economic Environment and Land Use

3.3.8.1 Land Use

The Bradford Layover Facility is located within the Artesian Industrial Park. The site is currently comprised of industrial and commercial properties housing four businesses and several vacant lots. Existing businesses include the following:

- Shor-Cais Foundation Contractors & Engineers Ltd.;
- Servicestar Freightways Inc.;
- Toromont Industries Ltd.; and
- HomeLife/Aurora Realty Ltd.

It is noted that Millford Developments Ltd. own vacant land at the site, but no buildings are present.

The Artesian Industrial Park is the subject of a CIP Area. The area currently supports a number of industrial uses as well as vacant lands planned for future industrial growth. The CIP (Sierra Planning and Management, 2013) identified that in 2012, Artesian Industrial Park was 37% vacant. In order to meet employment targets required under the Growth Plan, the Town is undertaking a number of initiatives to attract new businesses to this Park. Thus, it is assumed that, in the future, new industrial uses will exist in this area.

3.3.9 Air Quality

Section 3.1.9 provides a summary of the existing air quality conditions within the BRCE study area. The five representative rail segments selected for the BRCE study area include the area around the Bradford GO Station extending north and south as well as an area surrounding the proposed Bradford Layover Facility north of the station (Segment D). In summary, existing “Future No Build” air quality concentrations for acrolein and NO_2 do not exceed applicable criteria. Benzene and $PM_{2.5}$ concentrations for the “Future No Build” scenario occasionally exceed applicable criteria. B(a)P concentrations in the “Future No Build” air quality conditions regularly exceed applicable criteria; however, in some cases, the background levels of B(a)P exceed the applicable criteria, which is common across Canada in urban areas. Sensitive receptors in the vicinity of the Bradford Layover will experience higher increases in concentration of B(a)P. The concentration of B(a)P decreases as the distance to from the rail corridor to the sensitive receptor increases.

3.3.10 Noise

Idling at layover sites, which are areas dedicated for overnight train storage, is subject to the MOECC/GO Draft Protocol. For an existing layover facility, the desirable objective is that the equivalent continuous noise level (L_{EQ}) in any hour produced by the operation of the layover does not exceed the higher of the ambient sound level, combined with the existing industry, or 55 dBA.

For site selection of a future layover facility, the desirable objective is that the L_{EQ} in any hour produced by the operation of the layover does not exceed the higher of the ambient sound level, combined with the existing industry, or 45 dBA.

When the Adjusted Noise Impact is “noticeable or greater” at a receptor (larger than a 3.0 dB increase), the potential to mitigate the sound levels should be evaluated based on technical feasibility. At the detailed design phase, other considerations, such as engineering and economic feasibility will be evaluated.

Currently, the Barrie Layover Facility is the only train layover facility within the Barrie rail corridor study area. A new layover site, proposed to be located near the Bradford GO Station in the Artesian Industrial Park, is also required along the Barrie rail corridor to support the service expansion.

GO Trains are assumed to idle for greater than 60 minutes at all of the layover facilities along the Barrie rail corridor. At the layover facilities, the engines are set to idle for the purposes of heating or cooling prior to schedule dispatch or for maintenance purposes. At the Barrie Layover Facility, up to five locomotives, may be idling at one time and at the proposed Bradford Layover Facility up to four locomotives maybe idling at one time.

The noise assessment methodology, criteria, inputs, and other relevant noise information is further summarized in Section 3.1.10 of this EPR and more thoroughly detailed in the Noise and Vibration Impact Assessment, provided in Appendix H of this EPR.

3.3.11 Vibration

Section 7 of the Metrolinx-GO Transit Adjacent Development Guidelines (2013) indicates that a developer need not assess vibration if the development is to be located further than 75 metres from the tracks, which is considered the recommended minimum vibration influence area. Metrolinx has determined that vibration at 75 metres will not exceed the 0.14 mm/s criterion. Therefore, sensitive receptors setback further than 75 metres from the proposed second track need not be assessed. All of the sensitive receptors that surround the future layover facility are located more than 75 metres away from the facility.

3.3.12 Traffic and Transportation

3.3.12.1 Infrastructure

The Bradford Layover Facility is located on the west side of the Barrie rail corridor, between the at-grade crossings with Industrial Road and Line 9. The site is bounded by the GO Barrie rail corridor to the east, Artesian Industrial Parkway to the west, Line 8 to the south, and Line 9 and existing businesses to the north.

The concept plan for the Bradford Layover Facility is provided in the TIA (Appendix I of this EPR). As shown, the facility is designed to provide train storage for six, 12-car consists (two locomotives and 12 coaches). A number of small ancillary buildings will also be located on the site including a staff and storage building, train servicing vehicle storage and sanitary waste building, and sanding facility, coupled with power infrastructure (e.g., transformer yard, and back-up generator), fire protection system, and various material holding tanks and storage areas.

Road access to the site would be from Artesian Industrial Parkway on the west side of the Barrie rail corridor. The site will include paved roadways to facilitate vehicle movements throughout the site, and to provide access to the diesel locomotives and train sets. The site will be enclosed with high security (Clear-Vu) perimeter fencing, and a high speed bi-folding gate installed at the vehicle entrance, with a turnstile for staff and train crews. Both the gate and turnstile will require security access control, remote monitoring and operation, and CCTV coverage.

3.3.12.2 *Traffic Operations*

The layover site includes 30 parking spaces for staff and visitors, and two accessible parking spaces. The proposed access to the Bradford Layover Facility is from Artesian Industrial Parkway, which is a collector road with minimal through traffic that primarily services the Industrial Park and is expected to have significant spare capacity. There are two existing intersections that can be used to access Artesian Industrial Parkway. The first, is Dissette Street/Line 8/Artesian Industrial Parkway, which is currently a signalized T-intersection. The other intersection is Artesian Industrial Parkway/Line 9, which is currently an unsignalized T-intersection. Since there are only a total of 32 parking spaces proposed at the site, the Bradford Layover Facility will not generate a significant amount of traffic.

The Barrie rail corridor intersects Industrial Road approximately 680 metres south of the southern boundary of the proposed layover facility. It is assumed that the volume of traffic travelling over the crossing is low due to its location and the minor amount of industrial activity to the east.

It is noted that the Town of Bradford West Gwillimbury OP identifies a potential Highway 400/404 Link (Bradford Bypass), proposed to be located immediately to the south of the layover facility lands.

3.3.13 *Utilities and Municipal Infrastructure*

No utilities cross the property or rail ROW in the vicinity of the proposed Bradford Layover Facility other than the utilities and municipal infrastructure that service the existing buildings on these properties. These existing utilities and municipal infrastructure include telecom, gas, hydro, water and sewers.

4. Impact Assessment of the Preferred Design

4.1 Methodology

The impact assessment of the preferred design 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:

- Natural Environment Report – provided in Appendix A;
- Tree Inventory Plan and Arborist Report – provided in Appendix B;
- Stage 1 Archaeological Assessment – provided in Appendix C;
- Cultural Heritage Screening Report – provided in Appendix D;
- Cultural Heritage Evaluation Reports, Statements of Cultural Heritage Value and a Heritage Impact Assessment – provided in Appendix E;
- Socio-Economic and Land Use Characteristics Report – provided in Appendix F;
- Air Quality Study – provided in Appendix G;
- Noise and Vibration Impact Assessment – provided in Appendix H; and
- Traffic Impact Analysis – provided in Appendix I.

The impact assessment of the preferred design in this EPR is structured according to the following aspects and Project components:

- Climate Change;
- Rail Infrastructure;
- GO Station Improvements; and
- Bradford Layover Facility.

Potential effects and their corresponding recommended mitigation measures, monitoring activities, and anticipated net effects have also been organized in this EPR by the following categories:

- Affected environment (e.g., Natural Environment, Cultural Environment, Social and Built Environment);
- Affected feature (e.g., Wildlife, Terrestrial Habitat, Aquatic Habitat, Significant Natural Areas, etc.); and
- Project phase (e.g., Pre-Construction Land Clearing/Property Acquisition, Construction, Operations and Maintenance).

The analysis and recommendations summarized herein are based on conservative assumptions regarding potential effects that could occur as a result of the BRCE Project. They are also based on information available at the time of the TPAP. During the detailed design phase of the BRCE Project, more information will be known about how the BRCE Project 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 the BRCE Project.

4.2 Climate Change

Climate change is usually associated with any significant change in long-term weather patterns. Changes in the composition of the atmosphere is resulting in processes that alter global temperature and precipitation, and is 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. In an effort to mitigate climate change and the effect it can have on the environment, government agencies have developed strategies and guidelines to reduce GHG emissions into the atmosphere, including carbon dioxide, as well as implement measures that reduce impacts and enhance resiliency.

The Government of Ontario has committed to reducing GHG emissions to 80% below 1990 levels by 2050 and has established two mid-term targets of 15% below 1990 levels by 2020 and 37% below 1990 levels by 2030, 2015.

The MOECC has developed a Climate Change Strategy (MOECC, 2015), which outlines the five areas that Ontario will focus on in order to achieve the GHG reduction targets, including:

- 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.

Metrolinx is committed to ensuring that the existing transit network, and new transit facilities/infrastructure, will have a low-carbon footprint and contribute to a clean and healthy environment for future generations (Metrolinx, 2014), goals which are aligned with the MOECC Climate Change Strategy. Further, their Sustainability Strategy 2015 - 2020 addresses climate change through its five goals, notably Goal 1: Become Climate Resilient; and Goal 2: Reduce Energy Use and Emissions (Metrolinx 2017-2020). Metrolinx will also align with the spirit of *Infrastructure for Jobs and Prosperity Act* (Province of Ontario, 2015). Section 3.11 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."*

4.2.1 Effects of the BRCE Project on Climate Change

The effect of the BRCE 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. Details are provided below.

4.2.1.1 Sustainability

Metrolinx has launched a Sustainability Strategy 2015 - 2020 that outlines five goals regarding how Metrolinx can plan, build, and operate to achieve meaningful progress towards sustainability. The RTP (The Big Move, 2008) outlines the long term projects, plans, and activities Metrolinx will deliver to support Ontario's overall GHG emissions by promoting a shift from single-occupant vehicles to more energy-efficient options like walking, cycling, carpooling, and teleworking. The Sustainability Strategy builds on the RTP and Metrolinx's Five Year Strategy (2015-2020), focusing on ensuring that sustainability is embedded in the approaches, policies, and processes to deliver all identified projects, plans, and activities.

The sustainability vision for Metrolinx is to work together to reduce our impact on the environment and to enhance opportunities for communities. The Sustainability Strategy acts as a roadmap for Metrolinx to achieve this vision. The five goals of the Sustainability Strategy focus on five priority sustainability issues, which are most important to Metrolinx and its stakeholders, and represent areas of greatest need and opportunity. These include:

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 integrate sustainability criteria into our vendor management decisions.

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.

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.

These goals will be implemented through an approach based on people, systems, and performance management systems that ensure progress is measured and reported on to the public. Through the five goals, the Sustainability Strategy aligns and supports initiatives coming out of every level of government such as the *Infrastructure for Jobs and Prosperity Act* (2015), *Ontario's Climate Change Mitigation and Low-Carbon Economy Act* (2016), and Ontario's Climate Change Action Plan (2016-2020).

Metrolinx also made significant progress in achieving existing sustainability commitments outlined in the Five-Year Sustainability Strategy (2015 - 2020). In 2015, Metrolinx achieved Gold Status for full signatory status on the International Association of Public Transport (UITP) Sustainability Charter and Gold Status on the American Public Transportation Association (APTA) Sustainability Commitment. It is noted that the APTA works to improve and advance public transportation and has set Transit Sustainability Guidelines. The guidelines outline emission and pollution control as well as how to efficiently use resources. It is also worth noting as it relates to Goal 2 that Metrolinx's Energy and Emissions Management Plan has been updated to cover the 2017 – 2020 time period.

The Bradford Layover Facility will aim to achieve Leadership in Energy and Environmental Design (LEED) Gold Certification, a certification system administered by the Canada Green Building Council. LEED is a sustainable building rating system that was developed to encourage the implementation of environmental and indoor health measures to create an environmentally sustainable development. Achieving LEED Certification for the Bradford Layover Facility would further increase the sustainability of the BRCE Project by improving air and water quality, enhancing urban ecology, reducing GHG emissions and reducing solid waste, amongst other things. In addition, LEED principles and initiatives will be implemented into the design and construction of the GO Station improvements where practically and economically possible.

4.2.1.2 Transit

The implementation of the BRCE Project will promote public transportation and "transit supportive" neighbourhoods by enabling two-way all-day service on the Barrie line which will attract new ridership through the provision of increased capacity, faster service, and greater scheduling flexibility. 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 the average commute time, even with an increasing population (Metrolinx, 2008). Consequently, more people will use public transportation, which will result in a decrease to vehicular GHG emissions emitted per resident (Metrolinx, 2008). Furthermore, the future transition to electric trains will eliminate GHG emissions

associated with diesel trains along the Barrie rail corridor. Air emissions associated with electricity generation required to power the electric trains will instead occur at regulated electricity generation facilities.

4.2.1.3 *Emission Impacts on Regional Air Quality*

The assessment of emission impacts associated with the BRCE Project on a regional scale was based on the annual emission calculations. This is discussed in more detail in the Air Quality Study provided in Appendix G of this EPR. As noted therein, annual emissions for both scenarios, "Future No Build" and "Future Build" (also referred to as Future, Scenario 1 are very low compared to the provincial emissions for all contaminants. The "Future Build" Scenario will have an increase in emissions due to the increase in train traffic from 14 to 36 trains per day. However, compared to the provincial emissions, the BRCE Project is expected to have little effect on regional air quality. All contaminants are estimated to be well below 1% of the provincial levels.

An additional Future Scenario was considered but not specifically modelled. This scenario is also identified as "Future, Scenario 2", however for the purposes of air quality this scenario will be referred to as "Future Build Scenario 2". The ultimate service level will include train traffic of up to 180 electric trains per day on the expanded Barrie rail corridor. Electric trains do not produce air emissions at the point of use (hence the reason this Scenario was not modelled). 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.

4.2.1.4 *Vegetation*

As noted in the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR, the construction of the new rail infrastructure, GO Station improvements and Bradford Layover Facility will require the removal of trees and vegetation, which will result in a temporary loss of an existing carbon sink within the local study are environment. Trees will mainly be compensated through off-site plantings, coordinated with the TRCA and LSRCA and affected municipalities. Compensation plantings will consist of high quality, long living, native species that will continue to sequester carbon throughout their long lifespan. Planting will occur on-site where reasonable, such as the stations and the layover facility, and will be determined through Landscape Plans to be developed prior to construction phase. Trees and other vegetation added to these areas will improve local carbon sequestration and reduce heat island impacts.

4.2.2 *Effects of Climate Change on the BRCE Project*

Consideration has been given on how the changing climate has the potential to impact the BRCE Project and the proposed infrastructure for both the short-term (pre-construction land clearing/property acquisition and construction) as well as the long-term (operations and maintenance) phases of the Project. Details are provided as follows.

4.2.2.1 *Stormwater Management*

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, which can result in larger volumes of precipitation at one time. Other climate variables such as temperature are major inputs to evaporation and snowmelt processes. Increases in temperature are likely to impact precipitation and snowmelt runoff volumes discharged to storm sewer systems, however, temperature has not historically been considered in storm sewer design.

Current SWM practices include the use of Intensity-Duration-Frequency (IDF) data and design storms (e.g., Chicago Storm, Regional Storm). In order to consider the potential implications of the changing climate on the BRCE Project, a number of storms that exceed the current design standard and the most up-to-date IDF curves will be used in the design of stormwater systems. A detailed SWM Plan will be developed prior to the construction phase of the BRCE Project to ensure that runoff from rainfall is controlled to ensure the following objectives are met:

- No increase in flood risk to the adjacent properties;
- Maintain existing flow patterns and reduce the baseline number of flood vulnerable areas within the Barrie railway corridor; and
- Control 2 - 100 year post-development flow to a minimum of the pre-development levels for any design storm events (as a climate change adaptation strategy post-development storm events will be increased by 25%).

The SWM design will give consideration to and comply with drainage and SWM objectives based on guidance provided by the MOECC Stormwater Management Planning and Design Manual (2003), MTO Drainage Management Manual (2008), and the ARMEA Manual for Railway Engineering (2013), supplemented by current guidance available from local municipalities and conservation authorities.

The SWM design for the new GO Station improvements and the Bradford Layover Facility may incorporate LID measures. For example, LID technology will be considered for the Kiss & Ride or staff parking areas. It is noted that LID technology has been successfully implemented at the East Gwillimbury GO Station (TRCA, December 2012).

LID measures would serve the purpose of controlling stormwater quantity and quality and would aid in promoting a more naturalized control of stormwater. Such measures would allow for increased infiltration of the stormwater, which would be beneficial should storms increase in intensity. The design of the LID measures would follow the LID Guidelines for Stormwater Management (SWM) Design (TRCA/Credit Valley Conservation (CVC), 2010). Over the long-term operation of the BRCE Project, SWM facilities including LID measures would be monitored by Metrolinx (GO Transit) operation staff to ensure that these features are maintained appropriately and repaired where and when required.

4.2.2.2 *Erosion and Sediment Control*

An increase in storm intensity can make erosion and sedimentation more likely in the study area, especially during construction. Erosion and Sediment Control (ESC) measures will be implemented during the construction phase of the BRCE Project to ensure stormwater runoff entering area sewers and watercourses is not laden with sediment. The Greater Golden Horseshoe Area Conservation Authorities (GGHACA) ESC Guidelines for Urban Construction (December 2006) will be followed to ensure the proper ESC measures are installed during construction and monitored during the post-construction period.

4.3 Rail Infrastructure

4.3.1 Wildlife, Terrestrial Habitat, Aquatic Habitat, and Significant Natural Areas

4.3.1.1 Potential Effects

Pre-Construction Land Clearing/Property Acquisition

Construction of the rail infrastructure will result in a larger footprint to accommodate the rail expansion within, and adjacent to, the existing Barrie rail corridor. Where the existing ROW is not wide enough to accommodate the proposed expansion, additional lands will need to be acquired and cleared. As a result of the ROW expansion, 38.25 ha of natural features will be removed. This includes:

- 22.76 ha of Significant Natural Areas, PSWs, Non-significant and Unevaluated wetlands, Significant Woodlands, Provincial and Candidate ANSIs, Significant Valleylands) and various Significant and Candidate SWH located within Significant Natural Areas; and
- 15.49 ha of Significant and Candidate SWH located outside of Significant Natural Areas.

Significant Natural Areas: Removal of portions of PSWs, Non-Significant and unevaluated wetlands, Significant Woodlands, Provincial and Candidate ANSIs and Significant Valleylands are summarized in Table 4-1. It is noted that many of these areas overlap. In total, 22.76 ha of Significant Natural Areas will be removed.

Construction laydown areas and easements will be identified prior to the construction phase. There is potential that these areas may result in additional loss of, or disturbance to, natural features present in the study area.

Wildlife Habitat: Portions of Significant and Candidate SWH and Habitat for SCC will need to be removed. Most of the wildlife habitats overlap with the natural areas listed in Table 4-1 with the exception of some open woodland, meadow and thicket-related habitats. In total 35.75 ha of wildlife habitat will be removed, of this 15.49 ha is outside of the Significant Natural Areas. A summary of wildlife habitat to be removed is provided in Table 4-2.

Several SWH types could not be identified in the study area due to limited property access. These included:

- Reptile Hibernacula;
- Rare Woodland Types;
- Rare Vegetation Communities; and
- Seeps and Springs.

As a result of limited property access, at the time of this Assessment, it is not known if these habitats are present within the study area. Therefore, pre-construction land clearing activities in the unevaluated areas could potentially impact these unidentified habitats.

Species at Risk: A number of areas identified as Significant or Candidate Significant Habitat of Endangered and Threatened Species will be cleared. In total, 21.45 ha of Candidate Habitat will be removed. Removal of this habitat may be subject to the ESA, 2007 which prohibits the killing, harming or harassing of Endangered and Threatened Species and destruction of their habitats. Much of this habitat is located within the Significant Natural Areas listed in Table 4-1. In total, 7.68 ha are located in meadow, thicket and open woodland areas outside of Significant Natural Areas. Species-specific considerations are as follows:

- *Candidate Habitat for Bobolink and Eastern Meadowlark:* A total of 5.46 ha of Candidate Bobolink and Eastern Meadowlark Habitat will be cleared. This habitat includes cultural meadows and non-intensive agricultural fields. Neither species is likely to nest in close proximity to the ROW due to noise from existing use of the rail corridor. Effects to these species are likely to be minimal; and
- *Butternut Trees:* A total of 35 trees are located within, or in close proximity to, the ROW and may be affected by land clearing activities associated with the BRCE Project. The health of these trees has not been confirmed but, based on preliminary observations, most of the trees appear to be healthy. These trees may need to be removed to accommodate the new rail infrastructure. Additional Butternut trees may also be present within the study area which have not been documented due to property access limitations. The removal of Butternut trees is regulated under the ESA, 2007.

Work within, or adjacent to, the habitats of these species will be subject to the species-specific mitigation described within the NER provided in Appendix A of this EPR. All other Significant and Candidate Significant Habitat of Endangered and Threatened Species will be subject to the general mitigation described within the NER.

Nests of Migratory Birds: Clearing of trees, shrubs and ground vegetation has the potential to disturb or destroy nests of migratory birds which are protected under the *Migratory Birds Convention Act* (MBCA, 1994).

Construction

Activities during construction beyond land clearing could also affect natural areas and features, as follows:

Significant Natural Areas, Wildlife Habitat and Species at Risk: All Significant Natural Areas and Significant and Candidate SWH, Habitat of SCC, Habitat of Endangered and Threatened Species could be affected during construction as follows:

- Grading and soil disturbance during construction can lead to erosion and sedimentation within significant natural features and watercourses. This can affect the quality of habitat, disturb ground vegetation and negatively affect the quality of fish habitat;
- Stockpiled materials, equipment or construction activities could accidentally encroach into natural areas beyond the proposed ROW limits. This could add to the disturbance to natural features and increase the quantity lost as a result of the Project. Soils beyond the proposed ROW limits could also become compacted or disturbed if activities extend beyond approved limits;
- 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 and the health of vegetation and wildlife within natural areas;
- Any disturbance to lands and vegetation clearing has the potential to allow invasive species to be introduced and spread through natural areas. Invasive species can prevent other native species from re-establishing;
- Dewatering required during the construction of any deep foundations or footings or other below-ground (sub-surface) works has the potential to affect groundwater levels, wetland water levels and the hydrology of other natural features; and

- Dust created as a result of construction has the potential to settle on adjacent vegetation, disturbing wildlife and their habitat.

Significant Valleylands: Any steep slopes associated with Valleylands could be disturbed by vegetation removal, grading work and the movement of large equipment. This could result in erosion, slumping, or slope failure.

Barn Swallow Nests: Two Barn Swallow nesting sites were identified within the study area. Both are located on structures that will need to be replaced or extended as a result of the BRCE Project. Nests are, therefore likely to be destroyed or disturbed. Active Barn Swallow nests are regulated under the ESA, 2007.

Linkage Areas and Deer Wintering/Yarding Areas: Accidental mortality could occur if wildlife inadvertently moves through construction zones. This could occur at any location along the corridor but the highest risk is at the 14 linkage locations identified in the NER. Risk is also high adjacent to the Deer Wintering and Yarding Areas located in close proximity to the corridor.

Table 4-1: Summary of Significant Natural Areas to be Removed to Accommodate the Rail Infrastructure

Location	Significant Natural Areas						Total Natural Area Removal Accounting for Overlap (ha)
	Provincially Significant Wetland (ha)	Non-Significant and Unevaluated Wetland (ha)	Significant Woodland (ha)[1]	Provincial Areas of Natural and Scientific Interest (ha)[2]	Candidate Areas of Natural and Scientific Interest (ha)[3]	Significant Valleylands (ha)[4]	
City of Toronto	0.00	0.00	0.00	0.00	0.00	0.34	0.34
City of Vaughan	0.38	0.54	0.20	0.00	0.58	0.74	1.66
Township of King	0.85	0.45	0.38	0.00	2.00	0.95	2.71
Town of Aurora	0.12	0.22	0.73	0.00	0.00	0.23	1.51
Town of Newmarket	0.01	0.45	0.28	0.00	0.00	1.76	2.07
Town of East Gwillimbury	0.20	0.5	0.85	0.00	0.41	3.59	3.23
Town of Bradford West Gwillimbury	1.00	1.26	1.17	0.34	0.00	1.23	2.97
Town of Innisfil	0.64	3.00	2.58	0.80	0.80	0.03	6.32
City of Barrie	0.00	0.19	0.19	0.00	0.00	1.83	1.96
Total:	3.19	6.6	6.37	1.14	3.80	10.70	22.76

[1] Some treed swamps are both a woodland and a wetland and therefore some areas are accounted for twice in this table.
[2] ANSIs overlap completely with wetlands and woodlands and are accounted for twice in this table.
[3] ANSIs overlap completely with wetlands and woodlands and are accounted for twice in this table.
[4] Portions of Significant Valleylands overlap with woodland and wetland areas and are accounted for twice in this table.

Table 4-2: Summary of Wildlife Habitats to be Removed to Accommodate the Rail Infrastructure

Location	Candidate Significant Wildlife Habitat		Significant Wildlife Habitat						Total Wildlife Habitat Removal Outside of Natural Areas[2]
	Significant Wildlife Habitat (All Types) (ha)	Habitat for Species of Conservation Concern (All Species) (ha)	Amphibian Breeding Habitat (Woodland and Wetland) (ha)	Deer Wintering and Yarding Areas (ha)	Osprey Nesting, Perching and Foraging (ha)	Terrestrial Crayfish (ha)	Seeps and Springs (ha)	Chorus Frog Habitat (ha)	
City of Toronto	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
City of Vaughan	1.20	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Township of King	0.00	4.29	0.00	0.00	0.00	Area located adjacent to the culvert at Mile 31.50. Loss to be confirmed prior to construction.	0.00	0.00	2.82
Town of Aurora	1.33	1.11	0.00	0.00	0.00	0.00	0.00	0.03	0.49
Town of Newmarket	1.63	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.20
Town of East Gwillimbury	2.38	1.17	0.00	1.45	0.00	0.00	0.00	0.26	0.06
Town of Bradford West Gwillimbury	4.74	9.47	0.00	1.80	0.00	0.00	0.00	0.00	2.61
Town of Innisfil	8.16	13.12	0.06	3.25	Includes one nest and surrounding 300 metres radius foraging areas.	0.00	0.07	0.32	8.93
City of Barrie	19.45	2.71	0.00	0.00	0.00	0.00	0.00	0.00	0.32
Total:	38.95	33.32	0.06	6.50	TBC [1]	TBC[1]	0.07	0.61	15.49

[1] *To be confirmed prior to the construction phase.*
[2] *This number is less than the total of all the habitat types because most are located within Significant Natural Areas and were accounted for in* Table 4-1. *This total only includes habitats outside of Significant Natural Areas.*

Fish Habitat: The addition of a second track will result in the need to extend culverts to span the proposed widened ROW. The installing or extension of culverts has the potential to harm fish habitat. A total of 46 culvert and bridge locations that convey watercourses are considered to be either direct or indirect fish habitat, are expected to be modified along the rail corridor as provided in the NER.

Redside Dace Habitat: Regulated habitat for Redside Dace is present within the following watercourses:

- Mile 15.40: three km upstream of the ROW crossing on a tributary of the Don River;
- Mile 24.80: East Humber River; and
- Mile 24.90: East Humber River.

The need for culvert/bridge replacement or extensions, and other in- and near-water work has the potential to harm Redside Dace and/or their habitat.

Wellhead Protection Areas: Though there are a number of WHPAs present along the Barrie rail corridor, transportation infrastructure is not subject to Source Water Protection regulations as it is unlikely to cause negative effects. There are 21 activities that constitute threats to drinking water as defined by source water protection. 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 activities and the circumstances required for a Threat occurrence, there are no activities related to the operation of the rail corridor that are anticipated to meet the criteria to be considered a source protection threat. Based on the expectation that there are no proposed activities related to the operation of the rail corridor that would constitute drinking water threats, no source water protection policies will apply to this corridor. 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 groundwater quality.

Operations and Maintenance

Operations and maintenance activities following installation of the new rail infrastructure have the potential to affect natural areas and features as follows:

Significant Natural Areas, Wildlife Habitat and Species at Risk: All Significant Natural Areas and Significant and Candidate SWH, Habitat of SCC, Habitat of Endangered and Threatened Species could be affected by operations and maintenance work, as follows:

- Significant maintenance activities requiring upgrades or replacement of major infrastructure components could require earth-moving or in-water works similar to activities described in the construction phase. In these instances the same type of effects noted under construction may also be experienced;
- Work will be undertaken to keep the rail ROW clear and free of any vegetation that could disrupt sight lines or interrupt the movement of train traffic. Trees adjacent to the ROW may need to be trimmed and any new vegetation regenerating within the ROW may need to be cleared. Trimming has the potential to harm healthy trees and allow disease or rot to expand. Any use of chemical pesticides to maintain the ROW also has the potential to affect groundwater and adjacent natural features if not applied correctly; and
- Spills of fuel and other hazardous materials 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.

Wildlife Habitat, Species at Risk and Nests of Migratory Birds: Some species are adapted to noise and the presence of human activity, while others are more sensitive. There are currently a minimum of 14 trains per day running from Union Station to the Allandale Waterfront GO Station with more frequent service in the more southerly portions of the corridor. Although some sensitive species were observed, the existing noise and activity levels are enough to deter most sensitive species. As train frequency, noise and activity increases along the corridor, more sensitive species may move away from the disturbance. Given the existing conditions, any increase in train noise and activity is likely to have a minimal effect.

Linkage Areas and Deer Wintering/Yarding Areas: The existing Barrie rail corridor is a long linear feature on the landscape. Some fencing is present along the existing ROW which acts to prevent some wildlife movement across the corridor. At completion, the BRCE Project will include full fencing along both sides of the proposed ROW, primarily for public safety purposes but will also be designed to accommodate needs for future electrification of the corridor. The fencing details will be determined prior to the construction phase. Subject to final design, the overall effect may be a long linear barrier across the landscape. The barrier effect will be most pronounced at the eight linkage locations where wildlife passage is currently limited, as identified in the NER. Movement will also be limited between and around the two Deer Yarding Areas located in close proximity to the corridor.

Despite the presence of fencing, there is potential for wildlife mortality as a result of wildlife/train collisions. With the increased frequency of train traffic, wildlife/train collisions are expected to increase. Exclusion fencing designed to keep wildlife out of the ROW can trap wildlife in the corridor if they inadvertently enter through a road crossing or other gap in the fencing. It is acknowledged that trapped wildlife are likely to be involved in collisions with trains. Collisions can occur anywhere across the corridor but are more likely to occur where wildlife are attempting to cross the corridor at the linkage locations identified in the NER and in the vicinity of the two Deer Wintering and Yarding Areas.

4.3.1.2 Mitigation Measures

Pre-Construction Land Clearing/Property Acquisition

Mitigation measures were developed to address each of the potential effects from the rail infrastructure. As part of the mitigation strategy, Metrolinx is currently consulting with conservation authorities and affected municipalities to establish a Vegetation Compensation Protocol for Metrolinx RER Projects. 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. The goal is to reduce administrative permitting burden for trees affected within long stretches of the rail corridor.

For Trees within Metrolinx Property: Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property. This will involve categorizing trees by community type/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with applicable conservation authorities and affected municipalities to develop the final compensation plan.

Conservation Authorities: For vegetation removals within conservation authority lands, applicable removal and restoration requirements will be followed.

Federal lands: For vegetation removals within Federally-owned lands, applicable removal and restoration requirements will be followed.

Tree End Use: Metrolinx will develop options for the end use of trees removed from Metrolinx property (e.g., reuse/recycling options).

Additional mitigation measures are as follows.

Significant Natural Areas: Mitigation will be implemented as follows:

- A qualified Environmental Inspector[24] is required throughout the construction period to ensure that protection measures are implemented, maintained and enforced.
- Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects;
- Clearing and grubbing will occur from the track-side of the natural area and a detailed ESC Plan will be developed to limit damage to the remaining natural areas;
- All work zones will be clearly marked on detailed design drawings and the ESC Plan to indicate that no work should occur outside the work zone; and
- Detailed clearing, ESC Plans and restoration plans will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects and approved landscaping plans developed prior to construction.

In wetlands: Mitigation will be implemented as follows:

- Wetlands will be restored as necessary to maintain the stability and function of the wetland and will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.

In woodlands[25]: Mitigation will be implemented as follows:

- Tree Protection Zones (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 plywood clad boarding or an equivalent material approved by the municipality; and
- No stockpiles, storage or disturbance to grade will occur within the TPZ to minimize soil compaction and root damage.

In Valleylands: Mitigation will be implemented as follows:

- Work on steep slopes will be limited to the extent possible. In areas subject to conservation authority regulations, detailed clearing and ESC Plans will be submitted to the TRCA and LSRCA for voluntary review;
- All construction laydown areas and easements will be located to avoid natural features (Candidate and Confirmed) to the extent possible; and
- All work zones will be clearly marked on detailed design drawings and the ESC Plan to indicate that no work should occur outside the work zone.

Wildlife Habitat: Mitigation will be implemented as follows:

- Where habitats could not be identified due to access restrictions (e.g., reptile hibernacula, rare woodlands, seeps and springs), pre-construction surveys will be conducted prior to the construction phase. 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 will take place outside of the breeding bird timing window, generally from April 1st to August 31st[26];
- 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 Ecologist/Avian Biologist confirms that the birds have fledged and the nest is no longer active; and
- If a nesting migratory bird (or SAR protected under ESA, 2007) is identified within or adjacent to the construction site, all activities will stop and the Contractor (with assistance from a qualified Ecologist) shall discuss mitigation measures with Metrolinx - Environment Program and Assessment Department staff. In addition, Metrolinx will consult with 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.

Habitats with a critical timing window at a different time of year (e.g., early spring migration and wintering habitats) will be assessed by a qualified Ecologist/Avian Biologist prior to any clearing to confirm that the habitat is not in use. If the habitat is being used for critical life functions (e.g., nesting, migration stopover,

[24] *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 erosion and sediment control 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.*

[25] *When applicable, during construction projects the City of Toronto requires tree protection to be installed for all trees, not just trees in woodlands. The City has established specifications for construction near trees which outlines the minimum Tree Protection Zones (TPZs) (based on size of the tree and bylaw regulation), prohibited activities, and tree protection measures which are to be implemented within the City of Toronto's boundaries. The document is titled "Tree Protection Policy and Specifications for Construction Near Trees."*

[26] *This timing window does not apply where habitats have been identified as part of the habitat of a SAR. In that case, timing windows will be confirmed by the MNRF.*

hibernation, overwintering), the area will be flagged and all clearing within the associated habitat will be avoided until the area is no longer in use. These additional timing windows are listed in Table 4-3.

- Any vegetation clearing will take place outside of the breeding bird timing window, generally from April 1st to August 31st;
- If clearing must occur within this window, a qualified Ecologist/Avian Biologist will first search the affected area. Any active nest 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; and
- If a nesting migratory bird (or SAR protected under ESA, 2007) is identified with9in or adjacent to the construction site, all activities will stop and the Contractor (with assistance from a qualified Ecologist) shall discuss mitigation measures with Metrolinx – Environment Program and Assessment Department staff. In addition, Metrolinx will consult with 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;
- Specific habitats that require inspection during these times are provided in the NER; and
- Compensation for habitats located within Significant Natural Areas will follow the mitigation measures laid out under Significant Natural Areas, identified within the NER;
- Where habitats do not coincide with a Significant Natural Area, compensation measures will be developed, as appropriate. Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects.

Species-specific mitigation is as follows:

- Significant Deer Wintering and Yarding Areas: Clearing and woodland removal will occur outside of the timing window listed in Table 4-3;
- Any vegetation clearing will take place outside of the breeding bird timing window, generally from April 1st to August 31st;
- If clearing must occur within this window, a qualified Ecologist/Avian Biologist will first search the affected area. Any active nest 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; and
- If a nesting migratory bird (or SAR protected under ESA, 2007) is identified within or adjacent to the construction site, all activities will stop and the Contractor (with assistance from a qualified Ecologist) shall discuss mitigation measures with Metrolinx – Environment Program and Assessment Department staff. In addition, Metrolinx will consult with 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. Table 4-3 (generally November 1st to March 31st), or will be inspected by a qualified Ecologist/Avian Biologist prior to clearing to confirm areas are not providing a critical wintering function. Areas immediately adjacent to the existing corridor are not likely to be used extensively by deer and therefore no additional mitigation or compensation measures are required, other than what is required for any overlapping habitats or features;
- Significant Osprey Nesting, Perching and Foraging: During the detailed design phase, the rail infrastructure will be designed to avoid the loss of the nest to the extent possible. If the nest cannot be accommodated in its current position, the MNRF will be consulted to develop a relocation plan. A plan would be developed in consultation with the MNRF and could include installation of a nesting platform in an alternative location and removal of the existing nest outside of the breeding season (April 1st to August 31st); and
- Significant Terrestrial Crayfish Habitat: Work in this area will be limited to the extent possible. If the habitat area cannot be avoided, disturbed areas will be restored to their original condition. Culvert design, land clearing and ESC Plans will be submitted to the TRCA and LSRCA for voluntary review.

Species at Risk: Mitigation will be implemented as follows:

- Detailed field surveys will be undertaken prior to the construction phase to confirm the presence of the following species:
  - King Rail;
  - Least Bittern;
  - Eastern Whip-poor-will;
  - Blanding's Turtle; and
  - Little Brown Myotis, Northern Myotis, and Tri-colored Bat.
- Findings of field surveys will be reported to the MNRF;
- During the detailed design phase, the rail infrastructure 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 consulted and all requirements under the ESA, 2007 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;
- 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 consulted;
- With regard to Butternut, the following mitigation measures will be implemented:
  - Detailed field surveys will be undertaken prior to the construction phase to confirm whether any additional Butternut trees are present within areas to be cleared beyond the 35 known locations;

- During the detailed design phase, the rail infrastructure will be designed to avoid the removal of Butternut trees to the extent possible;
- Any habitat damage identified during the field surveys or tree removal confirmed prior to the construction phase will be submitted to the MNRF. The approach for the BHA will be conducted in consultation with the MNRF 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 consulted and all requirements under the ESA, 2007 will be met, including any registration, Butternut Compensation Planting Plans and/or permitting requirements. If more than ten retainable trees must be removed, it is recognized that the exemption regulation does not apply and a permit and/or ministerial approval may be required.

Nests of Migratory Birds: Mitigation will be implemented as follows:

- Any vegetation clearing will take place outside of the breeding bird timing window, generally from April 1st to August 31st[27];
- 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 Ecologist/Avian Biologist confirms that the birds have fledged and the nest is no longer active; and
- If a nesting migratory bird (or SAR protected under ESA, 2007) is identified within or adjacent to the construction site, all activities will stop and the Contractor (with assistance from a qualified Ecologist) shall discuss mitigation measures with Metrolinx - Environment Program and Assessment Department staff. In addition, Metrolinx will consult with 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.

Table 4-3: Habitat Timing Windows

Habitat Type	Applicable Habitat Types[1]	Inspection Required During These Timing Windows[2] Prior to Clearing
Breeding Habitats		
Amphibian Breeding Habitat	Amphibian Breeding Habitat (woodlands); Amphibian Breeding Habitat (wetlands); Amphibian Woodland Breeding Habitat (vernal pools) (present in ORMCP only); Habitats for SCC: Western Chorus Frog.	March 15th to July 31st
Migration-Related Habitats		
Migratory Bird Stopover	Waterfowl Stopover and Staging Areas (aquatic).	February 1st to April 1st and August 31st to October 15th
Hibernation/Wintering Habitats		
Reptile Hibernacula	Reptile/Snake Hibernaculum (if observed prior to construction).	October 1st to April 30th
Turtle Overwintering	Turtle Overwintering Areas.	October 1st to April 30th
Deer Wintering Areas	Deer Wintering Areas; Deer Yarding Areas.	November 1st to March 31st
Raptor Wintering	Raptor Wintering Areas.	November 1st to March 1st

[1] Timing Windows for clearing of any Habitats of Endangered and Threatened Species will be determined through the ESA, 2007 permitting process.
[2] Timing windows apply to all Candidate Habitats unless an applicable Habitat Use Study is undertaken prior to construction and the Candidate Habitat is found to be non-significant.

Construction

Significant Natural Areas, Wildlife Habitat and Species at Risk: Mitigation will be implemented as follows:

- A qualified Environmental Inspector is required throughout the construction period to ensure that protection measures are implemented, maintained and enforced.
- 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.

[27] *This timing window does not apply where habitats have been identified as part of the habitat of a SAR. In that case, timing windows will be confirmed by the MNRF.*

ESC and Dewatering Plans will be developed the prior to construction phase in consultation with the TRCA and LSRCA and will conform to construction industry Best Management Practices (BMPs) and recognized standard specifications. The ESC Plan shall also take into account the GGHACA ESC Guidelines for Urban Construction (2006);

- All work zones will be clearly marked on detailed design drawings and the ESC Plan to indicate that no work should occur outside the work zone;
- ESC and dewatering measures will be implemented prior to 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 of the construction site will be stabilized and re-vegetated as soon as conditions allow;
- ESC measures will be left in place until all areas of the construction site have been stabilized and will then be removed;
- Wet weather restrictions shall be applied during site preparation and excavation. Work will be avoided near watercourses during periods of excessive precipitation and/or excessive snow melt;
- A Construction Emergency Response and Communications Plan will be developed prior to construction and followed throughout the construction phase (includes spill response plans);
- 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;
- Deleterious substances (including stockpiled material) will be used and stored in a manner that prevents any of the substances from entering a natural feature;
- Hazardous material and fuel storage, refueling and maintenance of construction equipment will occur within designated areas only;
- The Contractor will develop spill prevention and contingency plans and have them in place prior to construction of the BRCE 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 watercourses or 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; and
- Dust from the work areas will be controlled through suppressants (e.g., water).

All requirements under the *Invasive Species Act* will be met, including the following mitigation measures:

- All disturbed areas of 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; and
- If extensive invasion of non-native species is identified as a result of the BRCE Project, contingency measures may include an applicable herbicide application. A herbicide application plan will be developed as required and submitted to the applicable conservation authority for review.

All requirements under the *Ontario Water Resources Act* (OWRA), R.S.O. 1990, c. O.40 with respect to the quality of water discharging into natural receivers will be met, including the following mitigation measures and best practices:

- 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.

Significant Valleylands: Mitigation will be implemented as follows:

- Geotechnical studies will be completed prior to the construction phase to identify any design and mitigation requirements in, and around, Valleylands;
- Detailed design plans will be submitted to the TRCA and LSRCA for voluntary review to confirm that all work is in compliance with O. Reg. 166/06 and O. Reg. 179/06, respectively; 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.

Barn Swallow Nests: Mitigation will be implemented as follows:

- Field surveys will be undertaken prior to the construction phase to confirm the number of nests present at the known locations and whether the nests remain active;
- During the detailed design phase, the rail infrastructure and bridges will be designed to avoid the loss of Barn Swallow nesting sites to the greatest extent possible; and
- Where loss or disturbance (e.g., due to any work on the bridges) cannot be avoided, the MNRF will be consulted and all requirements under the ESA, 2007 will be met, including any registration, compensation, replacement structures and/or permitting requirements.

***Linkage Areas and Deer Wintering/Yarding Areas*:** Mitigation will be implemented as follows:

- Silt fence will be used as wildlife exclusion fencing within all areas identified as Linkage Areas;
- Speed limits will be posted along construction routes;
- Should wildlife species move into a construction zone, the Environmental Inspector will move species out of work area; and
- Should a SAR be encountered that are not identified on relevant permits, all work will cease within the immediate work area and the MNRF will be consulted.

Fish Habitat: Mitigation will be implemented as follows:

- All in-water work will be conducted in accordance with the timing windows to be confirmed in the Aquatic Habitat Assessment to be completed prior to the construction phase;
- 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;
- An Aquatic Habitat Assessment will be prepared prior to the construction phase to identify specific effects and mitigation associated with detailed culvert and bridge design plans; and
- All requirements under the *Fisheries Act* will be met including any Self-Assessments or permitting.

Redside Dace Habitat: Mitigation will be implemented as follows:

- An Aquatic Habitat Assessment will be prepared prior to construction to outline specific mitigation related to fish habitat loss and/or disturbance; and
- Construction activities will occur in accordance with the Guidance for Development Activities in Redside Dace Protected Habitat (MNRF, 2016b).

Wellhead Protection Areas: Prior to Project 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.

Operations and Maintenance

Mitigation to minimize effects during the operations and maintenance phase will include the following:

Significant Natural Areas, Wildlife Habitat and Species at Risk: Mitigation will be implemented as follows:

- Any major maintenance work that would result in the replacement or upgrade of major infrastructure components requiring earth-moving or in-water work will be conducted in accordance with the applicable mitigation measures listed under the construction phase;
- Any required permitting or authorizations will be obtained;
- Any herbicide applications to clear vegetation within the 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;
- An Emergency Response and Communications Plan will be developed and followed throughout the operations and maintenance phase (includes spill response plans);
- Metrolinx will develop spill prevention and contingency plans for the ROW. 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;
- Refueling and maintenance of trains will occur within designated areas only; and
- Spills or depositions into watercourses or 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.

Wildlife Habitat, Species at Risk and Nests of Migratory Birds: Mitigation will be implemented as follows:

- Environmental noise will be reduced to the extent possible through standard operating practices such as regular train maintenance and limiting whistling in accordance with all safety protocols and requirements.

Linkage Areas and Deer Wintering/Yarding Areas: Mitigation will be implemented as follows:

- Wildlife exclusion fencing will be installed along the boundaries of the Linkages Areas. This fencing will be designed to exclude small and mid-sized mammals, reptiles and amphibians from the ROW and direct them to a nearby ecopassage;

- Additional exclusion fencing will be installed adjacent to the two Deer Wintering Areas and will be designed to exclude deer from the ROW. Escape features (e.g., ramps to allow access over a section of fence) will be incorporated to assist deer that may inadvertently become trapped in the ROW;
- Exclusion fencing and escape features will be developed prior to the construction phase and will be designed in consultation with the TRCA/LSRCA and MNRF;
- Passage structures that accommodate movement of wildlife will be incorporated into the detailed design of associated culverts or bridges located at the Linkage Areas;
- Passages will be designed to allow for the movements of small and mid-sized mammals, reptiles and amphibians; and
- The TRCA and LSRCA will continue to be consulted throughout detailed design and prior to construction.

4.3.1.3 *Net Effects*

Pre-Construction Land Clearing/Property Acquisition

Significant Natural Areas: There will be reduced on-site vegetation but an overall increase in natural areas through off-site compensation. As such, in the long-term there will be no net effects.

Any inadvertently disturbed or damaged areas will be returned to their previous condition. As such, no net effects are anticipated.

Wildlife Habitat: There will be reduced on-site vegetation but an overall increase in natural areas through off-site compensation. As such, in the long-term there will be no net effects.

Species-specific net effects are as follows:

- Confirmed Significant Deer Wintering and Yarding Areas: Wintering and Yarding Areas to be cleared directly adjacent to the existing corridor are not expected to be well used by deer due to the existing noise. Thus, no net effects are anticipated;
- Confirmed Significant Osprey Nesting, Perching and Foraging: No net effects are anticipated as a replacement nesting site will be created, if required; and
- Confirmed Significant Terrestrial Crayfish Habitat: A small amount of Terrestrial Crayfish Habitat may be lost and will be determined prior to the construction phase. Any disturbed habitat will be restored. Thus, there may be minor effects but they are not expected to affect terrestrial crayfish species at the population level.

Species at Risk: All requirements under the ESA, 2007, will be met, thus no net effects are anticipated. With regard to Candidate Significant Habitats for Bobolink and Eastern meadowlark, no nesting habitat is expected to be present within the areas to be cleared. Thus, no net effects are anticipated.

Nests of Migratory Birds: No net effects are anticipated.

Construction

Significant Natural Areas, Wildlife Habitat and Species at Risk: Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. Metrolinx will carry out all work in accordance with the requirements of the *Invasive Species Act*. All dewatering will be conducted in accordance with regulatory requirements. As such, no net effects are anticipated.

Significant Valleylands: All requirements for working in proximity to steep slopes and watercourses will be met. Metrolinx will continue to consult TRCA/LSRCA throughout the detailed design process. No net effects are anticipated.

Barn Swallow Nests: All work in, and around Barn Swallow nests will be conducted in accordance with the ESA, 2007. Thus, no net effects are anticipated.

Linkage Areas and Deer Wintering/Yarding Areas: Construction activities will be carried out to avoid injury to wildlife. Any wildlife inadvertently injured as a result of construction activities will be limited to a very small number of individuals that will not affect species at the population level.

Fish Habitat: All in-water and near-water works will be completed in accordance with the requirements of the *Fisheries Act* and construction industry BMPs. Thus, no net effects are anticipated.

Redside Dace Habitat: All in-water and near-water works in and around Redside Dace Habitat will be conducted in accordance with the ESA, 2007. Thus, no net effects are anticipated.

Wellhead Protection Areas: No net effects are anticipated.

Operations and Maintenance

Net effects as a result of operations and maintenance activities are as follows:

Significant Natural Areas, Wildlife Habitat and Species at Risk: Vegetation trimming is not expected to have any significant effects. Thus, no net effects are anticipated.

Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.

Wildlife Habitat, Species at Risk and Nests of Migratory Birds: There may be a minor reduction in the use of adjacent habitats due to increased environmental noise. However, due to the existing (ambient) noise the change is likely to be minimal. The net effect is expected to be minor and localized.

Linkage Areas and Deer Wintering/Yarding Areas: Some mortality due to wildlife/train collisions is expected but net effects are likely to be minimal with no significant effects on species at the population level. Fencing along the full length of the corridor will create an overall loss of connectivity. With the proposed passage structures, the barrier effect is expected to be minimized.

4.3.1.4 Monitoring Activities

Pre-Construction Land Clearing/Property Acquisition

Significant Natural Areas: The following monitoring will be applied:

- Pre-construction land clearing activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified work zones; and
- The success of compensation plantings will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.

Wildlife Habitat: The following monitoring will be applied:

- An Environmental Inspector will regularly monitor that all work is conducted from within the specified work zones; and
- The success of compensation habitat 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, 2007. Butternut tree monitoring will be as determined by the MNRF and Metrolinx in accordance with the Butternut Compensation Planting Plan.

Nests of Migratory Birds: An Environmental Inspector will regularly monitor construction to confirm that activities do not encroach into nesting areas or disturb active nesting sites.

Construction

Significant Natural Areas, Wildlife Habitat and Species at Risk: The following monitoring will be applied:

- An Environmental Inspector will conduct regular inspections to confirm the ESC measures are functioning properly and are properly maintained throughout the construction phase;
- An 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;
- 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% survival rate and confirm that non-native and invasive species are not becoming pervasive as a result of the BRCE 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 or watercourse; and
- An Environmental Inspector will regularly inspect dust emissions during construction to confirm dust control watering frequency and rates are adequate.

Significant Valleylands: An Environmental Inspector will conduct regular inspections 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 confirm that all work is conducted in accordance with the ESA, 2007, and any associated permits/approvals.

Linkage Areas and Deer Wintering/Yarding Areas: An Environmental Inspector will conduct regular inspections to confirm that all exclusion fencing is working appropriately.

Fish Habitat: An Environmental Inspector will conduct regular inspections to confirm that all work is conducted in accordance with the *Fisheries Act* and any associated permits/approvals.

Redside Dace Habitat: An Environmental Inspector will conduct regular inspections to confirm that all work is conducted in accordance with the ESA, 2007, and any associated permits/approvals.

Wellhead Protection Areas: **:** An Environmental Inspector will conduct regular inspections, to be defined prior to construction, to confirm that hazardous material and fuel storage and refueling is conducted outside of WHPAs.

Operations and Maintenance

Significant Natural Areas, Wildlife Habitat and Species at Risk: The following monitoring 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;
- Metrolinx track inspectors and rail staff are responsible for monitoring the effects of trimming and herbicide application. Any significant concerns will be reported to superiors for timely resolution; and
- Metrolinx track inspectors and rail staff including maintenance contractors are responsible for reporting spills and other issues, and ensuring their timely resolution.

Wildlife Habitat, Species at Risk and Nests of Migratory Birds: No monitoring is required.

Linkage Areas and Deer Wintering/Yarding Areas: The following monitoring will be undertaken:

- Wildlife passages will be monitored by Metrolinx for two years to confirm that they are functioning appropriately;
- Exclusion fencing will be monitored by Metrolinx for two years to confirm that it is functioning appropriately, as designed; and
- Metrolinx will carry out regular, ongoing inspections to confirm all structures are in good working order.

4.3.2 Trees

4.3.2.1 Potential Effects

Construction

Tree removal is required to accommodate the BRCE Project. Land clearing, grading and construction will result in the removal of trees to the limit of the ROW (in most locations) and beyond, into the lands to be acquired outside the existing ROW. Trees on lands immediately adjacent to the construction limits that may not be acquired, may be impacted due to their rootzones overlapping with proposed construction (e.g., grading). These trees may currently serve as screening or aesthetic enhancement between businesses and residences and the Barrie rail corridor. The Butternut trees identified during the assessment may need to be removed, may be harmed or their habitat may be reduced as a result of tree removals and effects (including clearing) at the edge of forests, plantations and swamps.

A summary of total tree removals is provided in Table 4-4 and categorized by tree removals that will be required:

- Within the existing rail ROW;
- Between the existing rail ROW and the expanded rail ROW;
- For the Phase One corridor expansion; and
- For the Future Phase(s) of the corridor expansion.

The removal totals in Table 4-4 are based on known potential tree removals from data collected during the 2015 field season as well as approximated data for areas that were subsequently identified as development areas. Furthermore, the tree removal totals noted in Table 4-4 exclude the following:

- Trees having a DBH less than 10 cm if located outside TRCA or LSRCA regulated areas or City of Toronto Ravine and Natural Feature Protection (RNFP) By-law designated areas; and
- Trees removals identified in other EA processes, including:
- The Davenport Diamond Grade Separation TPAP area (Mile 3.91 to Mile 4.87); and
- The Barrie Corridor Double Track Expansion Class EA area 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.

A more detailed breakdown of tree removal information is provided in the Tree Inventory Plan and Arborist Report contained Appendix Bof this EPR.

Table 4-4: Tree Removals Summary to Accommodate Rail Infrastructure

Municipality	Total Trees[1] To Be Removed			
	Phase One: Rail Infrastructure (Toronto to Aurora) – Existing ROW	Phase One: Rail Infrastructure (Toronto to Aurora) – Proposed ROW Expansion (Land Acquisition Areas[2])	Future Phase(s): Rail Infrastructure – Existing ROW	Future Phase(s): Rail Infrastructure – Proposed ROW Expansion (Land Acquisition Areas)
City of Toronto	1,691	49	N/A	N/A
City of Vaughan	148	115	N/A	N/A
Township of King (South Portion)	102	178	N/A	N/A
Town of Aurora	200	243	85	68
Town of Newmarket	N/A	N/A	123	126
Town of East Gwillimbury	N/A	N/A	125	373
Township of King (North Portion)	N/A	N/A	0	0
Town of Bradford West Gwillimbury	N/A	N/A	136	641
Town of Innisfil	N/A	N/A	736	342
City of Barrie			634	573
TOTAL (approximate)	**2,141**	**585**	**1,839**	**2,123**

N/A = Not Applicable

[1] *Trees less than 10 cm DBH tallied if within TRCA or LSRCA regulated areas or City of Toronto RNFP By-law designated areas.*

[2] *Removal totals are estimated from aerial photography and field notes. Access was limited to the rail corridor land at the time of this study.*

Operations and Maintenance

Deterioration of trees' vitality that are adjacent to the expanded Barrie rail corridor over time was the only identified effect due to the BRCE Project during the operations and maintenance phase. It is noted that new growing conditions as a result of exposure may result in failure of trees or their branches.

4.3.2.2 Mitigation Measures

Construction

It is the intent of Metrolinx to minimize tree removal where reasonable. Retaining walls and creative approaches to grading have been used to minimize tree removal and injury to maintain screening, preserve wildlife habitat and minimize effects to natural heritage features, to the extent practical. This tree preservation will be further refined during preparation of the detailed design.

Where tree permits are required on municipal land or private property adjacent to the ROW, Metrolinx will work with authorities as necessary to obtain all applicable permits and approvals. Metrolinx is also currently consulting with conservation authorities and municipalities to establish a Vegetation Compensation Protocol for Metrolinx RER projects. 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 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. The goal is to reduce administrative permitting burden for trees affected within long stretches of the rail corridor.

For Trees within Metrolinx Property: Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property. This will involve categorizing trees by community type/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with applicable conservation authorities and affected municipalities to develop the final compensation plan.

Conservation Authorities: For vegetation removals within conservation authority lands where required, applicable removal and restoration requirements will be followed.

Federal lands: For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements will be followed.

Tree End Use: Metrolinx will develop options for the end use of trees removed from Metrolinx property e.g. reuse/recycling options.

A Certified Arborist will complete a detailed assessment of trees within and adjacent to the proposed ROW expansion limits prior to construction to determine required Tree Protection Zones (TPZs) and protection measures. Tree protection barriers will be installed at the TPZs prior to construction to protect retained trees, minimize damage to roots, and will be no closer than the dripline where reasonable. The barriers will be installed around trees to be protected using plywood clad hoarding or an equivalent material approved by the municipality. All supports and bracing to safely secure the barrier will be placed outside the TPZ.

The TPZ will delineate the area where disturbance cannot occur from construction activities including the stockpiling and storage of materials, and/or passing of equipment. These activities must occur in designated staging areas and work zones and environmentally sound practices will be followed and monitored by the Environmental Inspector.

In locations where trees will be preserved but injuries are anticipated (e.g., root severance), mitigative measures carried out by or under the direction of a Certified Arborist will occur (e.g., root pruning) in coordination with the construction.

Furthermore, a Certified Arborist will inspect and assess the newly created edge of forests, plantations, woodlands and swamps prior to commencement of use of the second track to identify hazardous limbs and trees for removal.

Registration of the damage to Butternut tree habitat and/or tree removal, coupled with submission of a BHA to the MNRF will need to occur. Compensation for the damage to Butternut tree habitat and/or removal of Butternut trees will be coordinated with the MNRF by Metrolinx and the Certified Butternut Health Assessor prior to construction. The number of compensation trees will be determined and a Butternut Compensation Planting Plan with monitoring commitments will be required.

Where on-site compensation cannot be accomplished within the Landscape Plans, Metrolinx will work with the conservation authorities and municipal agencies to explore off-site compensation. The Vegetation Compensation Protocol for Metrolinx RER projects to be determined between Metrolinx, conservation authorities, and municipalities will be applied to offset the loss of tree canopy.

Operations and Maintenance

Once the construction phase is complete, diligence by Metrolinx Track Inspectors during the ongoing Operations and Maintenance phase will be required to identify hazard trees and limbs that may fall onto the rail corridor, parking areas, or station or layover property. Pruning and felling will be carried out by or under the direction of a Certified Arborist. Tree replacement may be required to compensate adjacent landowners if the condition of off-site trees deteriorates as a result of the implementation of the BRCE Project (e.g., exposed edge resulting from maintenance pruning). A Certified Arborist will inspect and assess trees on-site and on lands immediately adjacent annually (at minimum) from the Metrolinx property and consult with Metrolinx to determine appropriate management, as needed (e.g., felling of damaged leaning trees).

4.3.2.3 Net Effects

Construction

There will be a reduced tree canopy within the existing and proposed expanded ROW due to tree removals. Metrolinx will work with the conservation authorities and municipal agencies to explore off-site compensation. The Vegetation Compensation Protocol for Metrolinx RER Projects to be determined between Metrolinx, conservation authorities, and municipalities will be applied to offset the loss of tree canopy.

The successful implementation and establishment of the new Butternut tree plantings will result in an overall net increase in Butternut canker resistant trees.

Trees that are subject to new growing conditions at newly created edges of treed natural heritage features may have a reduced vitality or failure over time if the trees are unable to overcome the conditions at the edges of work zones and newly exposed edges.

Operations and Maintenance

Tree canopy will be reduced until compensation plantings become established and can replace or enhance the canopy coverage, as required.

4.3.2.4 *Monitoring Activities*

Construction

A qualified Environmental Inspector is required throughout the construction period to ensure that protection measures are implemented, maintained and enforced. The Inspector will oversee the installation of the silt fencing and/or tree protection barriers as per the tree protection plans prepared by the Certified Arborist prior to construction. This Inspector will work with the Contractor and Metrolinx to confirm that the tree protection plans are implemented. It is understood that tree protection plans may need to be adjusted according to site conditions by the Environmental Inspector and/or a Certified Arborist. The Inspector will also be responsible for regularly monitoring construction to confirm that activities do not encroach into areas protected by the TPZ barriers. The Inspector will also monitor the barriers (along with signage for TPZs, where required) to ensure proper installation and functionality. This will ensure that effects to protected trees and off-site lands are protected for the duration of the construction. If the silt fencing and tree protection are not functioning, alternative measures will be implemented and prioritized above other construction activities. A post-construction assessment of the trees adjacent to the construction zone by a Certified Arborist is recommended to occur.

The Contractor that installs the edge management, landscape, mitigation and/or compensation plantings is responsible for monitoring establishment success and tending to the plant material as site conditions (e.g., drought conditions) require for the length of the warranty period.

The Contractor that plants the compensation Butternut trees is responsible for tending and monitoring the plants as determined by the MNRF and Metrolinx.

A designated monitor, such as a certified Butternut Health Assessor, is required to monitor the planted Butternut trees and determine if additional tree care, maintenance or replacement trees are required. Any tending, mitigation or replacement of plantings is required to occur by the Contractor prior to the end of the monitoring period. A Landscape Architect (licensed to practice in the province of Ontario) or qualified designate will be required to confirm the success of plant establishment through warranty inspections.

Inspections by a Certified Arborist may be required through the construction period to identify dead trees or limbs adjacent to the ROW.

Operations and Maintenance

Regularly scheduled track patrols will identify dead trees or limbs at risk of falling on tracks that are capable of disrupting train or maintenance traffic.

A Certified Arborist will inspect and assess trees on-site and on lands immediately adjacent annually (at minimum) from the Metrolinx property.

4.3.3 *Archaeological Resources*

4.3.3.1 *Potential Effects*

During the pre-construction land clearing/property acquisition phase of the BRCE Project, it is possible that land clearing activities required to prepare for the construction of the rail infrastructure could affect known and/or potential archaeological resources, including the following:

- Known cemeteries:
  - Mt. Sinai Memorial Park (Mile 9.30);
  - Maple United Church Cemetery (Mile 18.18); and
  - St. Paul's Cemetery (59.18).
- Potential cemeteries associated with St. Helen's Historic Church (Mile 3.35) and LeFroy United Church (Mile 51.92);
- A potential ossuary associated with the Hope site (AlGv-199), a documented ancestral Huron-Wendat village; and
- Various zones of archaeological potential located on both sides of the Barrie rail corridor and shown on Figures 32 to 53 in the Stage 1 Archaeological Assessment provided in Appendix C of this EPR.

The presence and/or extent of these features have not been confirmed and thus the effects are not fully understood at this time. Additional study requirements are noted in Section 4.3.3.2.

Operations and Maintenance

During operations and maintenance, no potential effects related to archaeological resources are anticipated.

4.3.3.2 *Mitigation Measures*

Construction

With respect to the known and potential cemeteries, mitigation will be applied and/or additional studies will be completed in order to confirm mitigation requirements, as follows:

Known cemeteries require protection and avoidance from any BRCE Project effects, including a temporary barrier to be erected around the known extent of the cemetery and "no go" instructions issued for all on-site crews as a precautionary measure. Lands within 10 metres of known cemeteries require completion of a Cemetery Investigation prior to any proposed ground disturbance related to the Project. A Stage 2 Archaeological Assessment that also includes archival research on properties with known or potentially containing cemeteries is also recommended. Subject to the findings of Cemetery Investigations and Stage 2 Archaeological Assessments, there is a possibility that further (Stage 3) Archaeological Assessment (with Indigenous engagement) and, ultimately, Stage 4 Protection/Avoidance of the Allandale site will be recommended. This requires that a licenced consultant archaeologist monitor the construction activities to ensure there are no effects to the site during construction. If the site cannot be fully protected and avoided, then some archaeological mitigation through salvage excavation, with Indigenous engagement, may also be required. Any mitigation developed as a result of further studies will be reviewed and confirmed with MTCS prior to construction.

A Stage 3 Cemetery Investigation, if required, will be completed by a licenced consultant archaeologist (licensed to practice in the province of Ontario) and be undertaken by mechanical excavation using a smooth-edged bucket to reveal undisturbed 'B' horizon soils. Throughout this process, the mechanical excavations will be periodically halted to permit cleaning of the exposed horizon and trench profiles by

shovel and trowel and to explore any apparent subsurface deposits, such as grave shafts and in situ burials. If human remains are confirmed to be present, then local law enforcement (e.g., local police force or the Ontario Provincial Police) and the Office of the Chief Coroner for Ontario will be immediately notified to review the discoveries and confirm that the site is not of forensic interest. Non-forensic findings will be subsequently communicated to the Cemeteries Registrar. Excavation will continue within the study area until a sterile 10 metres buffer is identified between the limit of excavation and any identified burials.

Upon completion of the investigations, the excavation areas will be backfilled. If grave shafts are identified, this will be preceded by the laying down of geotextile and a thin layer of granular to provide contrast over any sensitive deposits encountered. Any documented human remains will be subjected to protection and avoidance by effects proposed by the BRCE Project.

With regard to the potential ossuary at the Hope site (AlGv-199) mitigation will be applied and/or additional studies will be completed in order to confirm mitigation requirements. Specifically, a licenced consultant archaeologist will be present to monitor the removal of topsoil for all lands within the study area identified to possess potential for an ancestral Huron-Wendat ossuary. The methodology of this investigation will proceed as outlined above for Cemetery Investigations.

With regard to the various zones of archaeological potential identified on Figures 32 to 53 in the Stage 1 Archaeological Assessment provided in Appendix C of this EPR, mitigation will be applied and/or additional studies will be completed in order to confirm mitigation requirements, as follows:

- A Stage 2 Archaeological Assessment will be required prior to any land disturbing activities in the affected areas determined to have archaeological potential in the Stage 1 Archaeological Assessment;
- The Stage 2 Archaeological Assessment will involve a pedestrian or test pit survey to further define areas of archaeological potential and determine whether further studies or mitigation measures are required;
- The affected areas requiring Stage 2 Archaeological Assessment include Phase One and Future Phase(s) of the study area that have been identified as having archaeological potential, if it is determined prior to construction to be affected by the BRCE Project;
- Subject to the findings of the Stage 2 Archaeological Assessment, there is a possibility that further (Stage 3) Archaeological Assessment (with Indigenous engagement) and, ultimately, Stage 4 Protection/Avoidance of the Allandale site will be recommended. This requires that a licenced consultant archaeologist monitor the construction activities to ensure there are no effects to the site during construction. If the site cannot be fully protected and avoided, then some archaeological mitigation through salvage excavation, with Indigenous engagement, may also be required; and
- Any mitigation developed as a result of further studies will be reviewed and confirmed with MTCS prior to construction.

In the event that previously undocumented archaeological remains are found during land clearing, the proponent or person discovering the archaeological resources will cease alteration of the site immediately, and the licenced consultant archaeologist, approval authority, and the Cultural Programs Unit of the Ministry of Tourism Culture and Sport (MTCS) will be immediately notified. In the event that human remains are discovered, then local law enforcement (e.g., local police force or the Ontario Provincial Police) and the Office of the Chief Coroner for Ontario will be immediately notified to review the discoveries and confirm that the site is not of forensic interest. Non-forensic findings will be subsequently communicated to the Cemeteries Registrar. Excavation will continue within the study area until a sterile 10 metres buffer is identified between the limit of excavation and any identified burials. Any documented human remains will be subjected to protection and avoidance by effects proposed by the BRCE Project.

If prior to construction it is confirmed that the BRCE Project extends beyond the currently identified study area, then further Stage 1 Archaeological Assessment (Background Study and Property Inspection) will be conducted to determine the archaeological potential of the affected lands.

Operations and Maintenance

No mitigation measures are required.

4.3.3.3 *Net Effects*

Construction

Upon implementation of the mitigation and monitoring measures recommended for the BRCE Project by the licenced consultant archaeologist, no net effects related to archaeological resources are anticipated.

Operations and Maintenance

No net effects related to archaeological resources are anticipated during the operations/maintenance phase.

4.3.3.4 *Monitoring Activities*

Construction

The Environmental Inspector shall monitor land-disturbing activities to confirm they remain within the study area subject to the archaeological assessment(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

No monitoring activities are required.

4.3.4 *Cultural Heritage Resources*

4.3.4.1 *Potential Effects*

Construction

Construction activities associated with the rail infrastructure (e.g., demolition of structures, grading, staging, or other activities potentially causing disturbance to land or structures) could potentially impact the heritage attributes of the screened CHRs noted within Table 3-21. 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.
- 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 rail infrastructure is provided in Table 4-5.

The following CHRs will be directly affected by the new rail infrastructure:

- PHPs:
  - St. Clair Avenue West Bridge (Mile 5.24); and
  - Stone Box Culvert – 1 (Mile 20.86).

The following CHRs may be indirectly affected by the new rail infrastructure:

  - CHPs with previous heritage recognition:
  - Downsview Park and Airport, Listed, City of Toronto and the FHBRO (Mile 10.00);
  - Farmscape-1, Listed, City of Vaughan (Mile 20.32);
  - Golf Range, Listed, City of Vaughan (Mile 20.76);
  - Farmscape-2, Property of interest by municipality, City of Vaughan (Mile 20.84);
  - Farmscape-5, Listed, City of Vaughan (Mile 21.63); and
  - Sawyer/Cortelucci House, Designated, Part IV OHA (Mile 53.90).
- Adjacent properties:
  - National Cash Register Company Factory, Designated, Part IV OHA (Mile 3.20);
  - Maple Village HCD, Designated, Part V OHA (Mile 18.10-18.30);
  - Crawford and Maud Wells House, Designated, Part IV OHA (Mile 23.20);
  - Thomas Jaffrey Robertson House, Designated, Part IV OHA (Mile 33.90); and
  - Former Newmarket Train Station, Designated, Part IV OHA (Mile 34.35).

All remaining CHRs listed in Table 4-5 will not be affected affected by the new rail infrastructure.

Operations and Maintenance

No potential effects to CHRs are anticipated during the operations and maintenance phase of the BRCE Project.

4.3.4.2 *Mitigation Measures*

Construction

A HIA will be completed for the properties which are directly affected:

- St. Clair Avenue West Bridge (Mile 5.24); and
- Stone Box Culvert – 1 (Mile 20.86).

These HIAs will be completed prior to Project construction (e.g., during detailed design) based on Project timelines and property access constraints. The HIAs will be completed in accordance with the MTCS Standards and Guidelines, and will be developed in consultation with, and submitted for review to, the MTCS and other heritage stakeholders (municipal planners and/or municipal heritage committee). The HIAs will discuss the alternatives considered, and that all other alternatives to the alterations proposed to these structures have been considered and the best alternative has been adopted.

For indirectly affected properties, the mitigation listed in Table 4-5 will be implemented. For each respective property, this may include one or more of the following actions:

- Undertake consultation with heritage staff at the respective municipality to review the detailed design for the BRCE works, once available, and determine if any heritage attributes have been identified and confirm whether they may be indirectly impacted. If attributes are identified, a CHER will be required prior to Project construction to confirm potential impacts, and prescribe applicable mitigation measures;
- Potential effects on adjacent CHRs due to increased vibration will be assessed during detailed design in accordance with the Noise and Vibration Impact Assessment provided in Appendix H of this EPR and the Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects (Wilson, Ihrig & Associates Inc., et. al., 2012);
- Municipal heritage staff, and PDP as applicable, will be consulted regarding the visual aesthetics of the noise walls; and
- Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects, described in the Tree Inventory Plan and Arborist Report found in Appendix B of this EPR.

Table 4-5: Summary of Potential Cultural Heritage Impacts and Mitigation Measures for Cultural Heritage Resources Associated with Rail Infrastructure

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Effect	Mitigation
City of Toronto							
TO-02	3.20	National Cash Register Company Factory	222 Lansdowne Avenue	Part IV Designation, OHA (By-law 436-2003)	N/A[1]	Indirect Effect. Property is adjacent to the ROW. No encroachment or other direct effects. New track will be closer to the property; however, track is consistent with existing setting. Building is located within zone of potential vibration effects (Refer to the Noise and Vibration Impact Assessment provided in Appendix H of this EPR).	Vibration mitigation to be implemented as part of Project construction, in accordance with the Noise and Vibration Impact Assessment provided in Appendix H of this EPR and *Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects* (Wilson, Ihrig & Associates Inc., et. al., 2012).
T0-04	5.24	St. Clair Avenue West Bridge	N/A	Meets criteria in O.Reg. 9/06. Property is a PHP.	Built in 1931, this is a two-span, poured-in-place, reinforced concrete, rigid frame structure.	Direct Effect. Bridge to be altered to accommodate second track.	HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated.
TO-05	5.31	Former St. Clair Avenue Train Station	1550 St. Clair Avenue West	Listed, City of Toronto	Former location of the St. Clair Avenue Train Station.	No Effect. Encroachment along property line that will impact the parking/storage area. The train station appears to have been demolished/removed and there will be no impact to any heritage attributes associated with this property.	None Required.
TO-08	6.70	York Beltline Trail	N/A	PHP (MHC Decision Form, January 28, 2016)	N/A	No Effect. Encroachment onto the trail property is not required. Small amount of tree removal within existing corridor only (Refer to the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR). New track will be on the side of the ROW opposite to the property. New track is consistent with existing setting.	None Required.
TO-09 and TO-10	10.00	Downsview Park and Airport	35 Carl Hall Road and (No Municipal No.) Wilson Heights	Listed, City of Toronto; and FHBRO	N/A	Indirect Effect. Minimal encroachment along property line and on to parking lot. Noise wall to be installed on west side of the corridor. Noise wall is consistent with the industrial portions of the park. Noise wall may alter the park setting.	Consultation during detailed design or prior to Project construction will occur with PDP regarding the visual aesthetics of the noise wall in this location.

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Effect	Mitigation
City of Vaughan							
VA-04	17.96 to 18.02	Vaughan City Hall	2141 Major Mackenzie Drive	Listed, City of Vaughan	N/A	No Effect. Minimal encroachment along property line and parking lot. Existing noise wall on opposite side of the ROW will be retrofitted. New track closer to property. Building is located outside of the zone of potential vibration effects (Refer to the Noise and Vibration Impact Assessment provided in Appendix H of this EPR). New infrastructure is consistent with existing setting.	None Required.
VA-05	18.10-18.30	Maple Village HCD	N/A	Designated Part V OHA (By-law 167-2007)	N/A	Indirect Effect. HCD is adjacent to the ROW. New rail infrastructure will not directly affect the HCD. Existing noise walls to be retrofitted and new noise wall to be installed. Some buildings within the HCD may be located within zone of potential vibration effects (Refer to the Noise and Vibration Impact Assessment provided in Appendix H of this EPR).	Consultation with heritage staff at the respective municipality should be undertaken to review the detailed design for the BRCE Project works to determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, a HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Municipal heritage staff will be consulted regarding the visual aesthetics of the noise walls in this location. Vibration mitigation to be confirmed during detailed design, in accordance with the Noise and Vibration Impact Assessment provided in Appendix H of this EPR and *Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects* (Wilson, Ihrig & Associates Inc., et. al., 2012).

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Effect	Mitigation
VA-07	20.32	Farmscape – 1	11390 Keele Street	Listed, City of Vaughan	N/A	Indirect Effect. Minimal encroachment along property line. Noise wall along east side of corridor under Future, Scenario 2 New track to be located on east side of corridor. Minimal tree removal on east side (Refer to the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR). Noise wall may alter the existing setting/viewscape.	Consultation with heritage staff at the respective municipality should be undertaken to review the detailed design for the BRCE Project works to determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, a HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Municipal heritage staff will be consulted regarding the visual aesthetics of the noise walls in this location. Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.
VA-08	20.76	Golf Range	2480 Kirby Road	Listed, City of Vaughan	N/A	Indirect Effect. Minimal encroachment along property line. Noise wall to be added along east side of corridor under Future, Scenario 2 (opposite side of ROW). New track will be located closer to property. Minimal tree removal on portion of the property to be acquired (Refer to the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR). Noise wall may alter the existing setting/viewscape.	Consultation with heritage staff at the respective municipality should be undertaken to review the detailed design for the BRCE Project works to determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, a HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Municipal heritage staff will be consulted regarding the visual aesthetics of the noise walls in this location. Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Effect	Mitigation
VA-09	20.84	Farmscape – 2	11730 Keele Street	Property of interest by municipality	N/A	Indirect Effect. Minimal encroachment along property line. Noise wall to be added along east side of corridor under Future, Scenario 2 (opposite side of ROW). New track closer to property. Minimal tree removal on portion of the property to be acquired (Refer to the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR). Noise wall may alter the existing setting/viewscape.	Consultation with heritage staff at the respective municipality should be undertaken to review the detailed design for the BRCE Project works to determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, a HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Municipal heritage staff will be consulted regarding the visual aesthetics of the noise walls in this location. Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.
VA-10	20.86	Stone Box Culvert - 1	N/A	Meets criteria in O.Reg. 9/06. Property is a PHP.	Stone construction indicates potential design value and historical associations.	Direct Effect. New culvert to be installed. Portion of existing culvert to be buried.	HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated.
VA-13	21.63	Farmscape – 5	12024 Keele Street	Listed, City of Vaughan	N/A	Indirect Effect. Minimal encroachment along property line. New track on opposite side of the corridor. Minimal tree removal on opposite side of the corridor (Refer to the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR).	Consultation with heritage staff at the respective municipality should be undertaken to review the detailed design for the BRCE Project works to determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, a HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Effect	Mitigation
Township of King							
KI-01	23.20	Crawford and Maud Wells House	12974 Keele Street	Designated, Part IV, OHA (By-law 2009-73)	N/A	Indirect Effect. Property is adjacent to the ROW. No encroachment or other direct effects. New track on opposite side of the corridor. Minimal tree removal on opposite side of the corridor (Refer to the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR). Noise wall to be installed adjacent to property. Noise wall may alter the existing setting. Building may be located within zone of potential vibration effects (Refer to the Noise and Vibration Impact Assessment provided in Appendix H of this EPR).	Consultation with heritage staff at the respective municipality should be undertaken to review the detailed design for the BRCE Project works to determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, a HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Municipal heritage staff will be consulted regarding the visual aesthetics of the noise walls in this location. Vibration mitigation to be confirmed during detailed design, in accordance with the Noise and Vibration Impact Assessment provided in Appendix H of this EPR and *Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects* (Wilson, Ihrig & Associates Inc., et. al., 2012). Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.
KI-05	25.11	Country Day School	13415/13435 Dufferin Street	Listed, Township of King	N/A	No Effect. Minimal encroachment along property line. New track closer to property. Minimal tree removal on portion of the property to be acquired (Refer to the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR). No change to any buildings, setting or viewscape.	None Required. Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.
Town of Aurora							
AU-03	28.60	Radial Railway Bridge Abutment	520 Industrial Parkway South	Designated, Part IV OHA (By-law 4850-06.R)	N/A	No Effect. Property is adjacent to the ROW. No encroachment or other direct effects. Second span to be installed. Existing bridge to remain in place.	None Required.

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Effect	Mitigation
						New infrastructure is consistent with existing setting.	
Town of Newmarket							
NE-05	33.90	Thomas Jaffrey Robertson House	115-117 Main Street South	Designated, Part IV OHA (By-law 1988-143)	N/A	Indirect Effect. Property is adjacent to the ROW. No encroachment or other direct effects. Noise wall to be installed adjacent to property under Future, Scenario 2. New track closer to property. Noise wall may alter the existing setting.	Consultation with heritage staff at the respective municipality should be undertaken to review the detailed design for the BRCE Project works to determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, a HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Municipal heritage staff will be consulted regarding the visual aesthetics of the noise walls in this location.
NE-06	34.30	Former Newmarket Train Station	450/474 Davis Drive	Designated, Part IV OHA (By-law 1987-110)	N/A	Indirect Effect. Property is adjacent to the ROW. No encroachment or other direct effects. New track on opposite side of the corridor. Minimal tree removal within existing corridor only (Refer to the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR). Building may be located within zone of potential vibration effects (Refer to the Noise and Vibration Impact Assessment provided in Appendix H of this EPR).	Consultation with heritage staff at the respective municipality should be undertaken to review the detailed design for the BRCE Project works to determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, a HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Vibration mitigation to be confirmed during detailed design, in accordance with the Noise and Vibration Impact Assessment provided in Appendix H of this EPR and *Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects* (Wilson, Ihrig & Associates Inc., et. al., 2012). Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Effect	Mitigation
Town of Innisfil							
IN-09	53.90	Sawyer/ Cortelucci House	1350 6th Line	Designated, Part IV OHA (By-law 037-11)	N/A	Indirect Effect. Minimal encroachment along property line. New track closer to property. Minimal tree removal within existing corridor only (Refer to the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR).	Consultation with heritage staff at the respective municipality should be undertaken to review the detailed design for the BRCE Project works to determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, a HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.

[1] *N/A means Not Available.*

Operations and Maintenance

No mitigation measures are required.

4.3.4.3 *Net Effects*

Construction

Impacts to CHRs will be appropriately mitigated or avoided as much as possible through implementation of the mitigation measures to be identified in the recommended HIAs and/or mitigation carried out in accordance with other components of this study (e.g., vibration and tree removal mitigation).

Operations and Maintenance

No net effects to CHRs are anticipated during the operations and maintenance phase of the BRCE Project.

4.3.4.4 *Monitoring Activities*

Construction

Monitoring activities will be implemented in accordance with the HIAs and/or monitoring in accordance with other components of this study (e.g., vibration and tree removal monitoring).

Operations and Maintenance

No monitoring activities are required.

4.3.5 *Socio-Economic and Land Use Characteristics*

4.3.5.1 *Potential Effects*

Pre-Construction Land Clearing/Property Acquisition

The Socio-Economic and Land Use Characteristics Report provided in Appendix F of this EPR was prepared to evaluate potential effects related to socio-economic and land use characteristics that could occur as a result of the BRCE Project. As noted therein, the proposed new rail infrastructure was designed to limit the need for land acquisition. Attempts were also made to avoid potential effects to sensitive land uses and small urban properties which would be more significantly affected than a larger rural property.

In order to accommodate the new rail infrastructure, properties will need to be acquired, as follows:

- Phase One: Eight full properties and 90 partial properties, totaling 9.47 ha.
- Future Phase(s): Three full properties and 138 partial properties, totaling 16.18 ha.

Residential, Commercial and Industrial Lands: Lands with private residences and businesses will be acquired. To accommodate the full build out of the GO Expansion, seven full residential and commercial/industrial properties will be acquired in their entirety. An additional 105 residential and commercial/industrial properties will be partially acquired. Partial property acquisitions range from small, narrow strips along the property boundary, to larger portions affecting a larger proportion of land. Though potential effects will vary, they may include:

- Direct loss of property;
- Decrease in property value;
- Reduced buffer between the Barrie rail corridor and adjacent land use;
- Decreased future development potential;
- Loss of vegetation or other visual buffers which currently screen views of the Barrie rail corridor;
- Loss of secondary structures and amenity areas such as sheds, garages, patios, gardens, parking areas or fences on residential and other property types; and
- Loss of customer parking or reduced access to delivery areas on commercial and industrial lands.

There are also 71 properties in which some primary or ancillary structure, parking area or other feature has encroached into the existing rail ROW. Nearly all of these encroachments occur within the City of Toronto or the City of Vaughan. These structures will need to be removed in order to accommodate the new rail infrastructure. As Metrolinx does not permit construction or development within rail ROWs, landowners will be required to remove all encroaching features. Metrolinx will engage with affected landowners throughout detailed design and prior to construction of the BRCE Project to discuss removal of these encroaching features.

Institutional Lands: Portions of lands supporting community services and other institutional uses will be acquired. No schools, places of worship, government offices, daycare facilities, libraries or other community services will be fully acquired. However, several of the facilities are located on properties which will be partially acquired. Property acquisition is not expected to affect the quality or function of any community services.

Agricultural Land: In the study area, there are agricultural resources that support individual farms and business owners, and which are also important to the economic well-being of the community and province as a whole. A total of 9.62 ha of agricultural lands will be acquired for the entire BRCE Project to construct the new rail infrastructure. The amount of land required on each individual property is minor and is expected to result in a minimal or negligible reduction in productivity, yields and income for farm owners. There will be no loss to any lands within the Specialty Crop Area associated with the Holland Marsh. Acquisition does have the potential to disrupt farm infrastructure, including fencing, tile drainage and irrigation systems. The presence of this infrastructure will be confirmed prior to construction and the extent of potential effects determined.

Aggregate Resource Areas: A portion of lands designated as an aggregate resource area in the vicinity of Lefroy-Belle Ewart will be acquired. Specifically, future development phases of the BRCE Project will result in the loss of approximately 0.99 ha of these lands, which are identified as having a significant aggregate resource. However, much of the resource is covered by the existing rail ROW, residential development and lands protected for future development. As such, the aggregate resource is not likely to ever be accessible in the future, and therefore the effect of the BRCE Project is considered negligible.

Recreational and Open Space Lands (Parks and Trails): Acquisition of 6.45 ha of recreational lands and open spaces will be required. Parks tend to be relatively large properties with few built structures, most of which are not in close proximity to the existing rail ROW. As such, potential effects to parks are expected to be minimal and may include minor effects on existing parking and entrance areas, fencing and drainage.

Vacant Lands and ROWs/Easements: There are several vacant lots, road ROWs and unopened road allowances throughout the corridor. Acquisition of these lands totals 2.34 ha. Four of these properties will be acquired in their entirety. As these lands are currently not developed, effects are expected to be minimal. Any utilities which may be present within ROWs will be addressed and relocated as required.

Federal Lands: In total, 0.06 ha of federally-owned lands in Downsview Park will be acquired. The area to be acquired is a very narrow sliver adjacent to the existing Barrie rail corridor. The area is located between the rail corridor and the large commercial warehouse building housing the Downsview Park Merchants Market and Farmers Market. The building is not expected to be affected by the BRCE Project.

Future Growth Areas: In total, 6.89 ha of lands within future growth areas will be acquired. This includes land identified for future growth in Secondary Plan Areas and lands subject to a pending development application. Through the Growth Plan and other planning documents (e.g., OPs, Secondary Plans, Regeneration Studies, etc.) municipalities have set targets for future residential and employment growth. Though portions of these future growth areas will be acquired, property acquisition is not likely to significantly affect future growth targets or development potential.

A detailed inventory and discussion of the potential effects listed above is provided by municipality in the Socio-Economic and Land Use Characteristics Report provided in Appendix F of this EPR.

Construction

During the construction phase, temporary effects may be experienced by residents, institutional facilities, business owners and their clientele, transit riders, and road users (e.g., vehicles, pedestrians and cyclists) in the vicinity of the proposed construction works. Construction of the rail infrastructure may affect the following land uses and groups:

All Land Uses: Temporary nuisance effects from increased noise, dust, and vibration may be experienced on lands in close proximity to the rail corridor. Nearby residents, businesses, institutions may experience nuisance effects resulting from increased noise and vibration levels due to construction equipment and activities. Enjoyment of public and private recreational uses within the study area may be affected by increased noise levels due to construction equipment and activities.

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, some trees within the existing rail ROW and newly acquired lands will need to be removed. This may result in the loss of a visual buffer that previously screened views of the ROW. This will primarily affect residential properties as well as other visually-sensitive land uses such as parks, places of worship and cemeteries where quiet reflection and contemplation occurs. Altered viewscapes may also affect 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 rail corridor.

Temporary use of adjacent lands may be required for construction purposes (e.g., access, establishment of equipment storage/laydown areas, stockpiling of materials, etc.) through the use of construction easements or Temporary Limited Interests (TLIs).

Transit Riders: There may be a temporary inconvenience to transit riders, as construction of the rail infrastructure may have a temporary effect on service and cause occasional service delays.

Vehicle, Pedestrian, Cyclist and Agricultural Traffic: Any temporary road closures or lane restrictions necessary for construction activities may affect access to residences, parks, businesses and institutions within the construction area. Altered traffic routes and closures may affect the operation of a business, particularly if delivery and customer access is disrupted. Access restrictions on pedestrian and cycling trails, bike lanes and sidewalks can also affect travel for those without a vehicle, including the elderly and others with mobility challenges. Recreational use of trails for fun or health and exercise purposes can also be affected. Farm crossings are required in order to conduct agricultural operations and disruptions may affect operations or production.

Operations and Maintenance

Subject to funding approval; Metrolinx intends to increase service along the Barrie rail corridor in a phased approach over the next ten years to ultimately include:

- All-day, two-way 15-minute service between the Aurora GO Station and Union Station;
- Peak Period, peak direction 30-minute or better service between the Allandale Waterfront GO Station in Barrie and Union Station; and
- Off-peak, two-way 60-minute service or better between the Allandale Waterfront GO Station and Union Station.

This service level will provide a number of vital social and economic benefits. Businesses, property owners and users of services in close proximity to a GO Station will benefit the most from the increased service. Notwithstanding the many benefits, several social and economic effects may also potentially result from the BRCE Project. During the operations/maintenance phase, the following effects are likely to occur:

All Land Uses: Nuisance effects from increased noise, vibration and dust (adversely affecting air quality) may be experienced on lands in close proximity to the ROW from an increased number of passing trains. In addition, vibration may increase as a result of new switching locations and the installation of new tracks within closer proximity to developed areas. All land use types could be affected. Residential properties as well as sensitive institutional uses such as places of worship, funeral homes, cemeteries, daycares, schools and parks are more likely to be affected. Additional details can be found within the Air Quality Study and the Noise and Vibration Impact Assessment provided in Appendix G and Appendix H of this EPR, respectively.

Parks, Trail Crossing and Institutional Lands: The increased frequency of train traffic may present a safety concern for students attending schools in the study area. There are 13 schools within the study area, including King City Public School which is directly adjacent to the existing rail ROW and The Country Day School which is bisected by it. These elementary schools are attended by young children who may need to cross, or come in close proximity to, the Barrie rail corridor on their route to/from school. The Country Day School will face particular safety and property access challenges as various fields are separated by the rail ROW. Safety at parks and trail crossings where children and the general public play, cross or spend recreational time in proximity to the ROW may also be a concern. Additional details can be found within the TIA provided in Appendix I of this EPR.

Future Trails Proposed within the Existing Rail ROW: Several municipalities have proposed trails within the existing ROW as part of their municipal trail system. Installation of the second (additional) track within the corridor may affect the feasibility of developing these future trails within the ROW. It is not currently known whether these proposed trails can or cannot be accommodated safely within the expanded corridor, and therefore the potential effect is unclear. These proposed (or future) trails are currently planned at a high level, and have not been subject to any detailed planning, approval or design work by municipalities in coordination with Metrolinx.

4.3.5.2 *Mitigation Measures*

Pre-Construction Land Clearing/Property Acquisition

Residential, Commercial and Industrial Lands: Specific property requirements will be confirmed prior to the construction phase to determine the predicted property effects. Property acquisition required for the BRCE Project will be undertaken by Metrolinx, with the objective being to provide fair market value compensation to affected property owners in accordance with applicable laws.

All landowners with a structure or other infrastructure (e.g., fencing, gardens, etc.) encroaching onto the existing rail ROW will be notified by mail that the structures or other infrastructure will need to be removed by the property owner.

Institutional Lands: Specific property requirements will be confirmed prior to construction to determine the predicted property effects. Property acquisition required for the BRCE Project will be undertaken, with the objective being to provide fair market value compensation to affected property owners in accordance with applicable laws.

Agricultural Lands*:* Specific property requirements will be confirmed prior to construction to determine the predicted property effects. Property acquisition required for the BRCE Project will be undertaken by Metrolinx, with the objective being to provide fair market value compensation to affected property owners in accordance with applicable laws. Metrolinx will engage and negotiate with affected property owners regarding land acquisition required for the proposed works and to identify any potential effects to farm infrastructure such as livestock fencing, irrigation systems and tile drainage. Mitigation measures will be developed in consultation with individual owners, as required.

Aggregate Resource Areas: No mitigation is required as the effects are expected to be negligible. Metrolinx has, and will continue to, consult with the Town of Innisfil to ensure that any concerns regarding the aggregate resource in the Lefroy-Belle Ewart area are addressed.

Recreational and Open Space Lands (Parks and Trails): Property acquisition required for the BRCE Project will be undertaken by Metrolinx, with the objective being to provide fair market value compensation to affected property owners in accordance with applicable laws. Metrolinx will engage with park owners/operators to confirm effects. Mitigation measures will be developed in consultation with individual owners, as required.

Federal Lands: Any acquisition of federal lands will be coordinated with the CLCL. All required permits and approvals will be obtained in accordance with federal requirements.

Future Growth Areas: Municipalities have been consulted as part of the BRCE TPAP and will continue to be consulted throughout detailed design and prior to construction to ensure that potential effects are minimized.

Construction

All Land Uses: Mitigation measures related to increased noise, vibration, and dust effects (e.g., Dust Management Plan, etc.) will be implemented to ensure that nuisance effects are minimized during construction. Timing restrictions will be in place to limit the time of day for construction activities, as required by municipal by-laws. Additional details are presented in the Air Quality Study and the Noise and Vibration Impact Assessment, respectively. Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction. 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.

Metrolinx will coordinate tree removal compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects, as documented in the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR. Where appropriate, Metrolinx will seek to develop an aesthetically pleasing design for public-facing infrastructure in consultation with municipalities/adjacent landowners.

A review will be completed prior to construction commencement to identify temporary easements for construction or other purposes to accommodate the BRCE Project work. Construction will be planned to limit the need for construction easements to the extent possible. Construction staging/laydown areas and easements will be selected to minimize effects to the extent possible (e.g., vacant lands and industrial lands will be used as much as possible). Metrolinx will engage with affected land owners regarding easements required for the proposed works.

Transit Riders: Metrolinx will schedule and stage construction activities to avoid effects to existing train schedules to the extent possible. If the need for a closure arises, GO Buses will be available to take transit users to the next available station.

Vehicle, Pedestrian, Cyclist and Agricultural Traffic: Adequate construction hauling routes will be determined in consultation with municipalities. Site-specific Traffic Control and Management Plans will be prepared to maintain reasonable access through the work zones (e.g., maintain one lane in each direction, where possible). Plans to manage access to trails and farm crossings will also be prepared. Additional details are presented in the TIA provided in Appendix I of this EPR.

Operations and Maintenance

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), the MOECC/GO Draft Protocol (MOEE, 1994) and the Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning Publication NPC-300 (MOE, 2013). Mitigation measures related to noise and vibration and air quality will be implemented as described in the Air Quality Study and the Noise and Vibration Impact Assessment provided in Appendix G and Appendix H of this EPR, respectively. The use of electric trains on this corridor in the future would further reduce air quality effects. Mitigation to reduce noise effects will be developed as part of the detailed design, as required, based on noise modelling and projections. Additional details are provided in the aforementioned Air Quality Study and the Noise and Vibration Impact Assessment (Appendix G and Appendix H of this EPR, respectively).

Parks, Trails, Crossings and Institutional Lands: The Barrie rail corridor will be appropriately fenced to limit access. The adequacy of safety structures at all road and trail crossings is being studied by Metrolinx and any deficiencies will be addressed prior to the construction phase and prior to BRCE Project construction. Mitigation to address crossing concerns at The Country Day School (Mile 25.31) will involve consultation with the school prior to construction and prior to construction to address access to portions of the school property bisected by the ROW.

Future Trails Proposed within the Existing Rail ROW: Metrolinx respects the importance of park lands to communities. Metrolinx also supports municipal initiatives to promote active transportation and has discussed trail connections with municipalities throughout the BRCE Project TPAP. The feasibility of trails within or adjacent to the existing rail ROW will be confirmed on a site specific basis based on further dialogue with the pertinent municipality.

4.3.5.3 Net Effects

Pre-Construction Land Clearing/Property Acquisition

All Land Uses: The effects to properties will be mitigated by providing fair market value compensation in accordance with applicable law and through negotiations with affected property owners. Thus, net effects are expected to be minimal.

Residential, Commercial and Industrial Land Uses: No net effects are anticipated.

Institutional Lands: No net effects are anticipated.

Agricultural Lands: The effects to agricultural lands will be mitigated by providing fair market value compensation in accordance with applicable law and through negotiations with affected property owners. Thus, net effects are predicted to be minimal.

Aggregate Resource Areas: No net effects are anticipated.

Recreational and Open Space Lands (Parks and Trails): No net effects are anticipated.

Federal Lands: No net effects are anticipated.

Future Growth Areas: No net effects are anticipated.

Construction

All Land Uses: The effects of construction are expected to be temporary with all nuisance effects during construction minimized to the extent practical, including the effects due to temporary encroachment on adjacent lands. With the mitigation proposed, net effects are anticipated to be minimal.

The loss of trees will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects, as documented in the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR. Where on-site compensation cannot be accomplished within the Landscape Plans, Metrolinx will work with the conservation authorities and municipal agencies to explore off-site compensation. The compensation protocol to be determined between Metrolinx, conservation authorities, and municipalities will be applied to offset the loss of tree canopy.

Transit Riders: The temporary effects to transit riders during construction will be minimized to the extent practical. Thus, net effects are expected to be minimal.

Vehicle, Pedestrian, Cyclist and Agricultural Traffic: The temporary restrictions to access points will be minimized to the extent practical. Thus, net effects are anticipated to be minimal.

Operations and Maintenance

All Land Uses: The nuisance effects during operations will be mitigated through compliance with regulatory requirements and identified noise, vibration, and air quality mitigation measures. Thus, net effects are expected to be minimal.

Parks, Trail Crossings, Institutional Lands: No negative net effects are anticipated. Positive net effects are expected with the installation of appropriate fencing in areas currently lacking fencing.

Future Trails Proposed within Rail ROW: Potential fragmentation of trails may occur if effects cannot be mitigated prior to the construction phase.

4.3.5.4 Monitoring Activities

Pre-Construction Land Clearing/Property Acquisition

Commercial and Industrial Lands: No monitoring activities are required.

Residential, Commercial and Industrial Land Uses: No monitoring activities are required.

Institutional Lands: No monitoring activities are required.

Agricultural Lands: No monitoring activities are required.

Aggregate Resource Areas: No monitoring activities are required.

Recreational and Open Space Lands (Parks and Trails): No monitoring activities are required.

Federal Lands: No monitoring activities are required.

Future Growth Areas: No monitoring activities are required.

Construction

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 zones.

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. 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. Post-construction monitoring and environmental inspection will be carried out to confirm, to the extent practical, that lands disturbed as a result of the BRCE Project construction activities have been restored to their original use and condition as soon as reasonably possible after construction.

Post-construction monitoring activities and timing will be confirmed as part of the Vegetation Compensation Protocol for Metrolinx RER Projects. A Landscape Architect (licensed in the province of Ontario) or qualified designate will be required to confirm the success of the plant establishment through warranty inspections.

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. 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.

Transit Riders: Construction activities will be monitored by a qualified Environmental Inspector.

Vehicle, Pedestrian, Cyclist and Agricultural 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.

Operations and Maintenance

All Land Uses: Metrolinx will continue its ongoing inspection schedules to monitor the effectiveness of their GO Transit operations. In addition, Metrolinx will continue its ongoing complaints procedure to address any concerns raised by neighbouring land owners, municipalities, and/or the public.

4.3.6 Air Quality

4.3.6.1 Potential Effects

Construction

Construction activities associated with implementation of the new rail infrastructure for the BRCE Project will generally consist of excavation of soil, import and compaction of materials, ties, ballast and track that will come in and be assembled on site. Therefore, air emissions associated with the construction of the rail infrastructure are typically limited to the following:

- Fugitive dust emissions resulting from:
  - The necessary soil excavation and filling activities required to achieve the grading requirements of the expanded Barrie rail corridor;
  - The demolition of structures necessary to accommodate the grading requirements of the expanded Barrie rail corridor;
  - The stockpiling of soil and other friable construction materials; and
  - The transport of friable fill materials via dump trucks.

In addition, there will also be emissions generated from the combustion engines of construction equipment.

Operations and Maintenance

The potential effect on local air quality during operations and maintenance of the rail infrastructure is predicted to be very low as discussed in the Air Quality Study provided in Appendix G of this EPR. The BRCE Project will not cause any contaminants to become non-compliant. On a regional scale, all contaminants are estimated to be well below 1% of the provincial levels. There are therefore no undue effects from operations or maintenance activities associated with the rail infrastructure of the BRCE Project.

4.3.6.2 Mitigation Measures

Construction

The Contractor will implement BMPs to mitigate potential air quality effects associated with construction of the rail infrastructure, including but not limited to the following:

- Dust suppression measures (e.g., 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 Cheminfo Services Inc. March 2005 publication “Best Practices for the Reduction of Air Emissions From Construction and Demolition Activities”;
- Stockpiling of soil and other friable materials in locations that are less exposed to wind (e.g., protected from the wind by suitable barriers or wind fences/screens);
- Use of dump trucks with retractable covers for the transport of friable fill materials;
- Use of deconstruction[28] methods in lieu of demolition where feasible for affected structures;
- Minimize drop heights, use enclosed chutes, and cover bins for debris associated with deconstruction of affected structures;
- Washing of equipment and/ use of mud mats where practical at construction site exits to limit the migration of soil and dust off-site;
- Use of ESC measures such as silt fence and erosion control blankets to address areas with temporary unstabilized soil;
- Permanent stabilization of exposed soil areas with non-erodible material (e.g., stone or vegetation) as soon as practicably possible after construction in the affected area is complete; and
- Ensuring that all construction vehicles, machinery, and equipment are equipped with current emission controls, and in a state of good repair.

Operations and Maintenance

Operations and maintenance of the rail infrastructure will be carried out in accordance with applicable regulations and standards, including Ontario’s AAQC (PIBS#6570e01) (MOE, 2012). Mitigation is generally not required given there are no undue effects from operations and maintenance activities.

[28] Deconstruction is an environmentally-friendly method of demolition, focusing on the disassembly of buildings in order to recover and re-use construction materials to the extent practical. Deconstruction is simply building disassembly and material salvage, by taking apart or removing some building components for reuse. In contrast to demolition where buildings are knocked down and materials are either landfilled or recycled, deconstruction involves carefully taking apart portions of buildings or removing their contents with the primary goal to reuse as much material as possible. Deconstruction can take place prior to standard demolition, be an integral part of demolition, or largely take the place of conventional building removal.

4.3.6.3 Net Effects

Construction

The potential air quality effects associated with construction of the rail infrastructure noted above are expected to be temporary and localized to the areas adjacent to the corridor. Effects will be reduced to the extent possible through implementation of construction BMPs.

Operations and Maintenance

No appreciable net effects are anticipated from operations and maintenance activities.

4.3.6.4 Monitoring Activities

Construction

Construction activities will be monitored by a qualified Environmental Inspector who will frequently check the effectiveness of the mitigation measures and construction BMPs to confirm they are functioning as intended. In the event that mitigation is found to not be effective, the Contractor will be notified to implement revised mitigation measures designed to improve 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 make adjustments 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.

The Contractor will also establish a complaint response protocol for nuisance effects such as dust.

Operations and Maintenance

Metrolinx has ongoing inspection schedules to monitor the effectiveness of its GO Transit operations. An existing complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.

4.3.7 Noise

4.3.7.1 Potential Effects

Construction

It is anticipated that construction associated with installation of the second track, including grading, construction of retaining walls and bridges, as well as track construction, may cause noise levels at nearby receptor locations to temporarily increase above ambient conditions. The nature of the construction activity within the Barrie rail corridor is such that activities will move along the corridor as construction progresses, and therefore noticeable noise at any given receptor will be temporary or short term in duration. Activities likely to cause potential noise effects during installation of the rail infrastructure generally include:

- Excavation, grading and placement of fill;
- Retaining wall installation;
- Bridge construction; and
- Track (rail)installation.

These potential effects will be generally limited to the lands adjacent the Barrie rail corridor, and may be a short term nuisance to affected building occupants.

Operations and Maintenance

The desirable objective as defined in the MOECC/GO Draft Protocol is that the daytime equivalent sound level (L_{EQ}) (16-hr, 0700h-2300h) produced by future (expanded) rail service operation of the BRCE Project under assessment should not exceed the higher of:

- The daytime ambient sound level, combined with the sound level from existing rail activity; or
- 55 dBA (A-weighted Decibels) L_{EQ} (16-hr).

Furthermore, the nighttime L_{EQ} (8-hr, 2300h-0700h) produced by operation of the future GO Transit rail service should not exceed the higher of:

- The nighttime ambient sound level, combined with the sound level from existing rail activity; or
- 50 dBA L_{EQ} (8-hr).

The MOECC/GO Draft Protocol states that noise effects at a point of reception shall be expressed in terms of the Adjusted Noise Impact. The Adjusted Noise Impact is the difference between post-project noise (e.g., including ambient and future rail noise) and pre-project noise (e.g., including ambient and pre-project rail noise). Where the pre-project noise is less than 55 dBA L_{EQ} (16-hr) during the daytime or 50 dBA L_{EQ} (8-hr) during the nighttime, the pre-project noise shall be taken as 55 dBA L_{EQ} (16-hr) daytime or 50 dBA L_{EQ} (8-hr) nighttime.

According to the MOECC/GO Draft Protocol, the Adjusted Noise Impacts associated with the rail operations shall be rated with respect to the objectives as follows:

- Insignificant: Adjusted Noise Impacts between 0 and 2.99 dB;
- Noticeable: Adjusted Noise Impacts between 3 and 4.99 dB;
- Significant: Adjusted Noise Impacts between 5 and 9.99 dB; and
- Very significant: Adjusted Noise Impacts above 10 dB.

In cases where the Adjusted Noise Impact at a receptor is considered “Significant” (between 5 and 9.99 dB increase) or “Very significant” (greater than 10 dB increase), the potential to mitigate the sound levels shall be evaluated based on technical feasibility. At the detailed design phase, other considerations, such as engineering and economic feasibility will be evaluated.

Based on all inputs and criteria outlined in Section 3.1.10 of this EPR, noise modelling was conducted to evaluate the following:

- The Adjusted Noise Impact between the existing conditions and Future, Scenario 1; and
- The Adjusted Noise Impact between the existing conditions and Future, Scenario 2.

Impact ratings for the 162 receptors listed in Table 4-6 can be summarized as follows:

- 46 daytime Adjusted Noise Impacts were deemed to be Insignificant (e.g., less than 2.99 dB);
- 43 daytime Adjusted Noise Impacts were deemed to be Noticeable (e.g., between 3 and 4.99 dB;

- 64 daytime Adjusted Noise Impacts were deemed to be Significant (e.g., greater than 5 dB increase);
- 9 daytime Adjusted Noise Impacts were deemed to be Very Significant (e.g., greater than 10 dB increase);
- 22 nighttime Adjusted Noise Impacts were deemed to be Insignificant (e.g., less than 2.99 dB);
- 33 nighttime Adjusted Noise Impacts were deemed to be Noticeable (e.g., between 3 and 4.99 dB);
- 77 nighttime Adjusted Noise Impacts were deemed to be Significant (e.g., between 5 and 9.99 dB increase); and
- 30 nighttime Adjusted Noise Impacts were deemed to be Very Significant (e.g., greater than 10 dB increase).

The noise modelling results for sensitive receptors where a significant (or greater) impact is predicted and mitigation investigation is required are summarized in Table 4-6 below. The results of the Noise and Vibration Impact Assessment provided in Appendix H of this EPR indicate that the Adjusted Noise Impacts at the sensitive receptors exceed the 5 dB criteria for 68 of 162 sensitive receptors for Future, Scenario 1 and for 131 of 162 sensitive receptors for Future, Scenario 2.

Table 4-6: Summary of Adjusted Noise Impacts of the Future, Scenarios 1 and 2 in comparison to the Existing Conditions where Mitigation Investigation is Required

Sensitive Receptor ID	Period[1]	Predicted Project Noise Levels (dBA)[1]			Objective (dBA)[2]	Adjusted Noise Impact (dB)		Adjusted Impact Rating[3]		5 dB or Greater Increase?[4]		Mitigation Investigation Required?	
		Existing	Future			Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2
			Sc. 1	Sc. 2									
SR003	Day	51	56	61	55	0.9	6.1	I	S	No	Yes	No	Yes
	Night	43	54	59	50	4.4	8.6	N	S	No	Yes		
SR004	Day	54	58	62	55	2.7	7.2	I	S	No	Yes	Yes	Yes
	Night	46	56	60	50	6.4	9.8	S	S	Yes	Yes		
SR005	Day	54	59	63	55	4	7.5	N	S	No	Yes	Yes	Yes
	Night	48	58	61	50	7.8	10.6	S	VS	Yes	Yes		
SR006	Day	57	60	65	57	3.5	8.1	N	S	No	Yes	Yes	Yes
	Night	51	59	63	51	8.2	11.9	S	VS	Yes	Yes		
SR007	Day	59	64	70	59	5.1	10.5	S	VS	Yes	Yes	Yes	Yes
	Night	53	62	66	53	9.1	13.1	S	VS	Yes	Yes		
SR008	Day	59	63	68	59	3.5	8.6	N	S	No	Yes	Yes	Yes
	Night	54	62	66	54	7.6	12	S	VS	Yes	Yes		
SR009	Day	55	58	63	55	3.1	8	N	S	No	Yes	Yes	Yes
	Night	50	57	61	50	7	11.2	S	VS	Yes	Yes		
SR010	Day	53	58	62	55	2.6	7.4	I	S	No	Yes	Yes	Yes
	Night	49	57	62	50	7.2	11.5	S	VS	Yes	Yes		
SR011	Day	57	62	65	57	4.4	7.4	N	S	No	Yes	Yes	Yes
	Night	49	61	63	50	10.6	12.9	VS	VS	Yes	Yes		
SR012	Day	63	67	68	63	3.7	5.4	N	S	No	Yes	Yes	Yes
	Night	50	65	66	50	14.8	15.6	VS	VS	Yes	Yes		
SR013	Day	55	59	64	55	4.3	9.3	N	S	No	Yes	Yes	Yes
	Night	50	58	62	50	7.7	11.6	S	VS	Yes	Yes		
SR014	Day	51	56	61	55	0.8	5.6	I	S	No	Yes	No	Yes
	Night	46	54	58	50	4.3	8	N	S	No	Yes		
SR015	Day	55	59	64	55	3.6	8.6	N	S	No	Yes	Yes	Yes
	Night	49	57	61	50	6.7	10.5	S	VS	Yes	Yes		
SR017	Day	56	61	65	56	5	9.2	S	S	Yes	Yes	Yes	Yes
	Night	50	59	62	50	8.8	11.8	S	VS	Yes	Yes		
SR018	Day	53	58	60	55	3.2	4.7	N	N	No	No	Yes	Yes
	Night	50	58	61	50	8	10.8	S	VS	Yes	Yes		
SR020	Day	52	55	60	55	0.4	5	I	S	No	Yes	No	Yes
	Night	50	55	58	50	4.5	7.5	N	S	No	Yes		
SR021	Day	44	48	51	55	-7.3	-4.3	I	I	No	No	No	Yes
	Night	46	54	56	50	3.9	6	N	S	No	Yes		
SR022	Day	52	55	58	55	0.4	3.1	I	N	No	No	Yes	Yes
	Night	48	57	57	50	6.7	7.4	S	S	Yes	Yes		

Sensitive Receptor ID	Period[1]	Predicted Project Noise Levels (dBA)[1]			Objective (dBA)[2]	Adjusted Noise Impact (dB)		Adjusted Impact Rating[3]		5 dB or Greater Increase?[4]		Mitigation Investigation Required?	
		Existing	Future			Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2
			Sc. 1	Sc. 2									
SR023	Day	61	60	60	61	-1.1	-0.9	I	I	No	No	Yes	Yes
	Night	56	61	62	56	5.1	6.2	S	S	Yes	Yes		
SR024	Day	62	53	54	62	-8.8	-7.9	I	I	No	No	Yes	Yes
	Night	52	59	58	52	6.4	5.8	S	S	Yes	Yes		
SR025	Day	52	52	53	55	-3.3	-1.8	I	I	No	No	Yes	Yes
	Night	47	56	55	50	5.6	5.2	S	S	Yes	Yes		
SR026	Day	51	55	58	55	0	3.1	I	N	No	No	Yes	Yes
	Night	46	55	57	50	5.2	7.2	S	S	Yes	Yes		
SR027	Day	53	56	57	55	1.4	1.6	I	I	No	No	Yes	Yes
	Night	48	58	61	50	8.1	10.8	S	VS	Yes	Yes		
SR028	Day	55	59	63	55	4	8.4	N	S	No	Yes	Yes	Yes
	Night	51	58	61	51	6.8	9.9	S	S	Yes	Yes		
SR029	Day	61	65	69	61	4.1	7.3	N	S	No	Yes	Yes	Yes
	Night	55	65	67	55	9.9	12.2	S	VS	Yes	Yes		
SR030	Day	60	64	68	60	4.1	7.8	N	S	No	Yes	Yes	Yes
	Night	55	65	67	55	9.8	12.5	S	VS	Yes	Yes		
SR031	Day	48	53	58	55	-2.2	2.8	I	I	No	No	No	Yes
	Night	46	53	56	50	2.5	6	I	S	No	Yes		
SR032	Day	52	56	61	55	0.6	5.8	I	S	No	Yes	Yes	Yes
	Night	45	55	59	50	5.3	8.8	S	S	Yes	Yes		
SR033	Day	53	57	62	55	1.9	7.3	I	S	No	Yes	Yes	Yes
	Night	48	56	60	50	6.4	10.1	S	VS	Yes	Yes		
SR034	Day	48	52	58	55	-2.7	2.5	I	I	No	No	No	Yes
	Night	43	52	56	50	2.1	5.7	I	S	No	Yes		
SR035	Day	51	55	60	55	-0.1	5.2	I	S	No	Yes	No	Yes
	Night	43	54	58	50	4.4	8	N	S	No	Yes		
SR036	Day	50	54	59	55	-1	4.4	I	N	No	No	No	Yes
	Night	47	54	58	50	4.3	8	N	S	No	Yes		
SR037	Day	52	57	62	55	1.8	7.2	I	S	No	Yes	Yes	Yes
	Night	49	56	60	50	6.2	10	S	VS	Yes	Yes		
SR038	Day	50	55	60	55	-0.3	4.9	I	N	No	No	No	Yes
	Night	48	54	58	50	3.9	7.6	N	S	No	Yes		
SR039	Day	57	62	67	57	4.6	9.4	N	S	No	Yes	Yes	Yes
	Night	54	61	64	54	6.1	9.4	S	S	Yes	Yes		
SR040	Day	68	74	79	68	6.2	11.9	S	VS	Yes	Yes	Yes	Yes
	Night	67	72	77	67	5.7	9.9	S	S	Yes	Yes		
SR041	Day	56	61	66	56	5.1	10.3	S	VS	Yes	Yes	Yes	Yes

Sensitive Receptor ID	Period[1]	Predicted Project Noise Levels (dBA)[1]			Objective (dBA)[2]	Adjusted Noise Impact (dB)		Adjusted Impact Rating[3]		5 dB or Greater Increase?[4]		Mitigation Investigation Required?	
		Existing	Future			Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2
			Sc. 1	Sc. 2									
	Night	56	61	64	56	5	8.7	S	S	Yes	Yes		
SR042	Day	56	61	66	56	5.2	9.9	S	S	Yes	Yes	Yes	Yes
	Night	55	60	64	55	5.3	8.6	S	S	Yes	Yes		
SR043	Day	60	65	70	60	4.5	9.8	N	S	No	Yes	Yes	Yes
	Night	56	64	68	56	8.2	11.9	S	VS	Yes	Yes		
SR044	Day	58	62	68	58	4.3	9.6	N	S	No	Yes	Yes	Yes
	Night	54	62	65	54	7.4	11	S	VS	Yes	Yes		
SR045	Day	52	57	61	55	1.8	5.6	I	S	No	Yes	Yes	Yes
	Night	50	57	60	50	6.5	9.9	S	S	Yes	Yes		
SR046	Day	57	62	68	57	5.5	11	S	VS	Yes	Yes	Yes	Yes
	Night	57	62	65	57	5	8.9	S	S	Yes	Yes		
SR047	Day	47	52	56	55	-3.3	1.2	I	I	No	No	No	Yes
	Night	47	54	57	50	3.8	6.9	N	S	No	Yes		
SR048	Day	53	58	62	55	2.8	7.4	I	S	No	Yes	Yes	Yes
	Night	49	57	60	50	6.8	10.2	S	VS	Yes	Yes		
SR049	Day	46	50	55	55	-4.7	0.4	I	I	No	No	No	Yes
	Night	44	52	56	50	2.3	6.4	I	S	No	Yes		
SR050	Day	52	57	61	55	1.5	5.6	I	S	No	Yes	Yes	Yes
	Night	48	56	59	50	5.8	8.7	S	S	Yes	Yes		
SR051	Day	58	64	69	58	5.3	11.2	S	VS	Yes	Yes	Yes	Yes
	Night	54	62	67	54	7.8	12.6	S	VS	Yes	Yes		
SR052	Day	56	63	69	56	7	12.9	S	VS	Yes	Yes	Yes	Yes
	Night	57	61	66	57	3.6	8.7	N	S	No	Yes		
SR053	Day	48	54	60	55	-1.4	4.5	I	N	No	No	No	Yes
	Night	47	52	57	50	2.1	6.9	I	S	No	Yes		
SR054	Day	66	71	77	66	4.9	10.7	N	VS	No	Yes	Yes	Yes
	Night	57	69	73	57	11.7	16.2	VS	VS	Yes	Yes		
SR055	Day	62	69	75	62	7	12.9	S	VS	Yes	Yes	Yes	Yes
	Night	62	67	72	62	4.5	9.6	N	S	No	Yes		
SR056	Day	54	60	66	55	5.1	10.7	S	VS	Yes	Yes	Yes	Yes
	Night	55	58	63	55	3.1	7.9	N	S	No	Yes		
SR057	Day	53	59	63	55	3.8	7.6	N	S	No	Yes	No	Yes
	Night	53	58	62	53	4.8	8.7	N	S	No	Yes		
SR058	Day	51	57	62	55	1.7	6.5	I	S	No	Yes	No	Yes
	Night	50	55	59	50	4.8	8.7	N	S	No	Yes		
SR059	Day	50	56	60	55	0.7	5.1	I	S	No	Yes	No	Yes
	Night	49	54	58	50	3.9	7.6	N	S	No	Yes		

Sensitive Receptor ID	Period[1]	Predicted Project Noise Levels (dBA)[1]			Objective (dBA)[2]	Adjusted Noise Impact (dB)		Adjusted Impact Rating[3]		5 dB or Greater Increase?[4]		Mitigation Investigation Required?	
		Existing	Future			Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2
			Sc. 1	Sc. 2									
SR060	Day	44	51	52	55	-4	-2.9	I	I	No	No	Yes	Yes
	Night	51	56	57	51	5.2	6.2	S	S	Yes	Yes		
SR061	Day	53	60	64	55	4.7	9.3	N	S	No	Yes	Yes	Yes
	Night	52	58	62	52	5.8	9.5	S	S	Yes	Yes		
SR063	Day	41	48	52	55	-7.5	-3.1	I	I	No	No	No	Yes
	Night	44	51	56	50	1.4	5.6	I	S	No	Yes		
SR064	Day	52	58	63	55	2.7	8.3	I	S	No	Yes	Yes	Yes
	Night	51	56	61	51	5	9.6	S	S	Yes	Yes		
SR065	Day	54	58	60	55	2.5	4.8	I	N	No	No	Yes	Yes
	Night	51	57	58	51	6.6	7.7	S	S	Yes	Yes		
SR066	Day	48	54	59	55	-1	3.7	I	N	No	No	No	Yes
	Night	48	52	56	50	2.4	6.4	I	S	No	Yes		
SR067	Day	62	65	68	62	2.7	6.1	I	S	No	Yes	No	Yes
	Night	60	63	66	60	3.1	5.9	N	S	No	Yes		
SR068	Day	56	59	61	56	2.7	5.3	I	S	No	Yes	No	Yes
	Night	56	57	60	56	1.2	3.8	I	N	No	No		
SR069	Day	55	55	59	55	0.3	3.9	I	N	No	No	Yes	Yes
	Night	51	62	64	51	11.3	13.5	VS	VS	Yes	Yes		
SR070	Day	52	53	57	55	-1.9	1.7	I	I	No	No	No	Yes
	Night	49	52	55	50	2.3	5	I	S	No	Yes		
SR071	Day	59	63	67	59	3.8	7.9	N	S	No	Yes	No	Yes
	Night	61	60	64	61	-1.1	3	I	N	No	No		
SR075	Day	65	65	69	65	0.4	4	I	N	No	No	Yes	Yes
	Night	55	65	67	55	9.8	12	S	VS	Yes	Yes		
SR077	Day	56	57	61	56	1	4.6	I	N	No	No	Yes	Yes
	Night	51	57	59	51	5.2	7.6	S	S	Yes	Yes		
SR078	Day	60	61	65	60	1.1	4.9	I	N	No	No	Yes	Yes
	Night	55	60	63	55	5	7.5	S	S	Yes	Yes		
SR079	Day	56	60	63	56	3.5	7.3	N	S	No	Yes	No	Yes
	Night	59	58	61	59	-0.9	2.8	I	I	No	No		
SR080	Day	57	61	64	57	3.3	7	N	S	No	Yes	No	Yes
	Night	59	58	62	59	-0.5	2.8	I	I	No	No		
SR081	Day	54	57	60	55	1.7	5.1	I	S	No	Yes	No	Yes
	Night	55	55	58	55	0.3	3.3	I	N	No	No		
SR084	Day	59	60	62	59	0.5	2.8	I	I	No	No	No	Yes
	Night	54	58	60	54	4.7	5.8	N	S	No	Yes		
SR085	Day	59	59	63	59	0.6	4.1	I	N	No	No	Yes	Yes

Sensitive Receptor ID	Period[1]	Predicted Project Noise Levels (dBA)[1]			Objective (dBA)[2]	Adjusted Noise Impact (dB)		Adjusted Impact Rating[3]		5 dB or Greater Increase?[4]		Mitigation Investigation Required?	
		Existing	Future			Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2
			Sc. 1	Sc. 2									
	Night	51	58	60	51	7.2	9.4	S	S	Yes	Yes		
SR086	Day	52	53	57	55	-1.7	1.8	I	I	No	No	No	Yes
	Night	50	52	55	50	2.4	5.1	I	S	No	Yes		
SR088	Day	57	61	65	57	4.1	7.9	N	S	No	Yes	No	Yes
	Night	60	59	63	60	-1.5	2.5	I	I	No	No		
SR091	Day	61	62	65	61	0.2	3.4	I	N	No	No	Yes	Yes
	Night	51	61	63	51	10.1	11.9	VS	VS	Yes	Yes		
SR093	Day	63	64	68	63	0.5	4.4	I	N	No	No	Yes	Yes
	Night	56	63	65	56	7.2	9.7	S	S	Yes	Yes		
SR094	Day	58	59	62	58	0.5	4.2	I	N	No	No	Yes	Yes
	Night	52	59	61	52	6.1	8.4	S	S	Yes	Yes		
SR095	Day	69	70	74	69	1	4.3	I	N	No	No	Yes	Yes
	Night	64	69	71	64	5.3	7.5	S	S	Yes	Yes		
SR096	Day	55	56	60	55	1	4.8	I	N	No	No	Yes	Yes
	Night	50	56	58	50	5.4	8	S	S	Yes	Yes		
SR097	Day	55	58	62	55	2.8	7.2	I	S	No	Yes	No	Yes
	Night	56	56	60	56	-0.6	3.5	I	N	No	No		
SR098	Day	52	54	57	55	-1.2	2.1	I	I	No	No	No	Yes
	Night	48	53	55	50	3.1	5.2	N	S	No	Yes		
SR099	Day	65	68	72	65	3.4	7.2	N	S	No	Yes	No	Yes
	Night	67	66	70	67	-0.9	3	I	N	No	No		
SR100	Day	68	68	72	68	0.3	3.9	I	N	No	No	Yes	Yes
	Night	57	67	69	57	10.3	12.5	VS	VS	Yes	Yes		
SR101	Day	53	55	59	55	-0.2	3.6	I	N	No	No	No	Yes
	Night	52	54	57	52	2	5.1	I	S	No	Yes		
SR102	Day	58	60	64	58	1.5	5.3	I	S	No	Yes	No	Yes
	Night	58	59	62	58	1.2	4.5	I	N	No	No		
SR103	Day	64	67	70	64	2.5	5.6	I	S	No	Yes	No	Yes
	Night	63	65	68	63	1.8	4.2	I	N	No	No		
SR104	Day	59	63	66	59	3.9	7.5	N	S	No	Yes	No	Yes
	Night	61	61	64	61	0.6	3.2	I	N	No	No		
SR105	Day	56	56	60	56	0.8	4.3	I	N	No	No	Yes	Yes
	Night	50	56	58	50	6.3	8.2	S	S	Yes	Yes		
SR106	Day	55	56	59	55	0.5	4.3	I	N	No	No	No	Yes
	Night	52	55	58	52	3.5	6.1	N	S	No	Yes		
SR107	Day	55	58	62	55	2.8	6.8	I	S	No	Yes	No	Yes
	Night	57	56	60	57	-0.7	3.1	I	N	No	No		

Sensitive Receptor ID	Period[1]	Predicted Project Noise Levels (dBA)[1]			Objective (dBA)[2]	Adjusted Noise Impact (dB)		Adjusted Impact Rating[3]		5 dB or Greater Increase?[4]		Mitigation Investigation Required?	
		Existing	Future			Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2
			Sc. 1	Sc. 2									
SR108	Day	56	57	61	56	0.8	4.6	I	N	No	No	Yes	Yes
	Night	51	56	59	51	5.1	7.7	S	S	Yes	Yes		
SR109	Day	55	58	62	55	2.6	6.4	I	S	No	Yes	No	Yes
	Night	56	56	60	56	-0.2	3.3	I	N	No	No		
SR110	Day	55	56	60	55	0.8	4.4	I	N	No	No	Yes	Yes
	Night	50	55	58	50	5	7.4	S	S	Yes	Yes		
SR111	Day	58	61	64	58	2.8	6.6	I	S	No	Yes	No	Yes
	Night	59	59	63	59	-0.5	3.1	I	N	No	No		
SR112	Day	62	62	66	62	0.4	4.5	I	N	No	No	Yes	Yes
	Night	54	62	64	54	8.1	10.8	S	VS	Yes	Yes		
SR113	Day	58	58	62	58	0.2	3.6	I	N	No	No	Yes	Yes
	Night	50	58	60	50	7.4	9.6	S	S	Yes	Yes		
SR114	Day	57	59	62	57	1.6	5.1	I	S	No	Yes	No	Yes
	Night	56	58	61	56	2.2	4.9	I	N	No	No		
SR115	Day	59	60	64	59	1.3	5	I	S	No	Yes	No	Yes
	Night	56	59	62	56	2.9	5.7	I	S	No	Yes		
SR117	Day	63	63	67	63	0.3	4	I	N	No	No	Yes	Yes
	Night	54	63	65	54	8.8	11.1	S	VS	Yes	Yes		
SR118	Day	64	65	68	64	0.8	4.4	I	N	No	No	Yes	Yes
	Night	59	64	66	59	5.2	7.5	S	S	Yes	Yes		
SR119	Day	64	65	69	64	1.3	5.2	I	S	No	Yes	No	Yes
	Night	61	64	67	61	2.9	5.8	I	S	No	Yes		
SR120	Day	65	66	70	65	1.3	4.8	I	N	No	No	No	Yes
	Night	62	65	68	62	2.9	5.4	I	S	No	Yes		
SR121	Day	55	57	61	55	2	5.6	I	S	No	Yes	No	Yes
	Night	55	56	59	55	1	4	I	N	No	No		
SR122	Day	54	55	59	55	0.2	3.9	I	N	No	No	No	Yes
	Night	51	55	57	51	3.3	6.1	N	S	No	Yes		
SR124	Day	55	58	62	55	2.8	6.3	I	S	No	Yes	No	Yes
	Night	57	57	60	57	-0.6	2.7	I	I	No	No		
SR125	Day	58	58	62	58	0.4	4	I	N	No	No	Yes	Yes
	Night	51	58	60	51	7.2	9.5	S	S	Yes	Yes		
SR126	Day	61	62	66	61	1.3	4.7	I	N	No	No	No	Yes
	Night	58	62	64	58	3.2	5.6	N	S	No	Yes		
SR127	Day	64	66	69	64	2.2	5.3	I	S	No	Yes	No	Yes
	Night	63	65	67	63	1.3	3.8	I	N	No	No		
SR128	Day	55	58	62	55	2.5	6.3	I	S	No	Yes	No	Yes

Sensitive Receptor ID	Period[1]	Predicted Project Noise Levels (dBA)[1]			Objective (dBA)[2]	Adjusted Noise Impact (dB)		Adjusted Impact Rating[3]		5 dB or Greater Increase?[4]		Mitigation Investigation Required?	
		Existing	Future			Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2
			Sc. 1	Sc. 2									
	Night	56	56	60	56	0	3.5	I	N	No	No		
SR129	Day	55	57	61	55	1.6	5.2	I	S	No	Yes	No	Yes
	Night	53	56	58	53	2.4	5.1	I	S	No	Yes		
SR130	Day	57	58	61	57	0.7	4.1	I	N	No	No	No	Yes
	Night	52	57	59	52	4.6	6.9	N	S	No	Yes		
SR132	Day	54	55	59	55	-0.2	3.6	I	N	No	No	No	Yes
	Night	50	55	57	50	4.5	7.2	N	S	No	Yes		
SR133	Day	61	63	66	61	1.5	5.1	I	S	No	Yes	No	Yes
	Night	59	62	64	59	2.8	5.4	I	S	No	Yes		
SR135	Day	56	58	61	56	1.5	5	I	S	No	Yes	No	Yes
	Night	55	57	60	55	2.6	5.2	I	S	No	Yes		
SR136	Day	58	61	65	58	3	6.3	N	S	No	Yes	No	Yes
	Night	60	60	63	60	-0.8	2.4	I	I	No	No		
SR138	Day	62	62	66	62	0.1	4	I	N	No	No	Yes	Yes
	Night	52	62	64	52	10.6	12.9	VS	VS	Yes	Yes		
SR139	Day	55	56	59	55	1	3.9	I	N	No	No	No	Yes
	Night	52	55	57	52	2.9	5	I	S	No	Yes		
SR140	Day	58	60	63	58	1.5	4.9	I	N	No	No	No	Yes
	Night	56	59	61	56	2.6	5.1	I	S	No	Yes		
SR141	Day	61	63	66	61	1.7	4.9	I	N	No	No	No	Yes
	Night	59	61	64	59	2.6	5.3	I	S	No	Yes		
SR143	Day	63	64	68	63	1.3	5	I	S	No	Yes	No	Yes
	Night	60	63	66	60	3.4	6.1	N	S	No	Yes		
SR144	Day	61	62	65	61	0.4	4.1	I	N	No	No	Yes	Yes
	Night	53	61	64	53	7.8	10.2	S	VS	Yes	Yes		
SR147	Day	64	65	68	64	0.8	4.5	I	N	No	No	Yes	Yes
	Night	58	64	66	58	5.8	8.2	S	S	Yes	Yes		
SR148	Day	64	65	69	64	0.7	4.2	I	N	No	No	Yes	Yes
	Night	58	64	67	58	6.3	8.5	S	S	Yes	Yes		
SR149	Day	64	66	71	64	2.6	6.9	I	S	No	Yes	No	Yes
	Night	65	65	69	65	0	3.9	I	N	No	No		
SR150	Day	56	58	62	56	2	5.6	I	S	No	Yes	No	Yes
	Night	56	57	60	56	0.7	4	I	N	No	No		
SR151	Day	62	65	68	62	2.8	5.9	I	S	No	Yes	No	Yes
	Night	64	63	66	64	-0.4	2.5	I	I	No	No		
SR152	Day	61	61	65	61	0.7	4.3	I	N	No	No	Yes	Yes
	Night	55	61	63	55	6.2	8.5	S	S	Yes	Yes		

Sensitive Receptor ID	Period[1]	Predicted Project Noise Levels (dBA)[1]			Objective (dBA)[2]	Adjusted Noise Impact (dB)		Adjusted Impact Rating[3]		5 dB or Greater Increase?[4]		Mitigation Investigation Required?	
		Existing	Future			Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2	Sc. 1	Sc. 2
			Sc. 1	Sc. 2									
SR153	Day	57	58	62	57	1.5	5	I	S	No	Yes	No	Yes
	Night	55	57	60	55	2.3	4.9	I	N	No	No		

Notes:

[1] The L_{EQ} (Day) is evaluated for a 16-hour period (e.g., from 0700h to 2300h) and the L_{EQ} (Night) is evaluated for an 8-hour period (e.g., from 2300h to 0700h).

[2] The objective is the higher of the ambient sound level, combined with the existing rail activity, or 55 dBA (Daytime)/50 dBA (Nighttime).

[3] Adjusted Impact Ratings: I=Insignificant, N=Noticeable, S=Significant, VS=Very Significant.

[4] The potential to mitigate is considered when a significant (or greater) impact is predicted. This is equivalent to an increase of 5dB or greater, relative to the objective level, as per the MOECC/GO Draft Protocol. An adjacent noise impact greater than 5 dB requires the investigation of mitigation.

4.3.7.2 *Mitigation Measures*

Construction

Construction BMPs will be utilized to minimize any adverse effects from construction noise at nearby sensitive receptors. These practices include, but are not limited to:

- Complying with local municipal noise by-laws related to construction activities;
- Deconstruction procedures in lieu of demolition of affected existing structures wherever feasible;
- Operation of equipment with correctly installed and maintained sound attenuating devices;
- Using 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, and wherever pile driving is necessary, use methods that minimize noise (e.g., pre-drilling, switching impact with vibratory hammer, using augured cast-in-place piles, drilled shafts, 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 by Metrolinx in advance; and
- 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.

Operations and Maintenance

Applicable mitigation measures were assessed for the 68 and 131 sensitive receptors identified in Future Scenarios 1 and 2, respectively, that were modelled to have significant or very significant Adjusted Noise Impacts. The model assessed 68 and 122 noise barrier groupings, for Future Scenarios 1 and 2, and found that 30 and 52 noise barrier groupings were technically feasible. A total of 19,000 metres of new or modifications to existing/planned noise barriers are proposed for Future, Scenario 1. For Future, Scenario 2, a total of 36,800 metres of new of modifications to existing/planned noise barriers are proposed.

4.3.7.3 *Net Effects*

Construction

Building occupants adjacent to the rail infrastructure construction will temporarily be subjected to increased noise levels from planned construction activities. Temporary noise impacts from construction activities will be minimized to the extent practical through application of construction BMPs.

Operations and Maintenance

4.3.7.4 *Monitoring Activities*

No impacts or mitigation measures are required at 94 and 31 of the 162 sensitive receptors for Future Scenarios 1 and 2, respectively. Noise impacts from operations will be mitigated through the application of technically feasible noise barriers at 33 and 59 of the 162 sensitive receptors identified in this Report for Future Scenarios 1 and 2, respectively. The remaining 35 and 72 sensitive receptors, for Future, Scenario 1 and 2, respectively, may require noise mitigation measures that may not be technically or economically feasible. Assessment to address this net effect will be conducted during the detailed design phase.

Construction

Construction activities shall be monitored by a qualified Environmental Inspector who will frequently check the effectiveness of the mitigation measures and BMPs to confirm they are being employed to minimize any adverse effects from construction noise at nearby sensitive receptors. In the event that mitigation is found to not be effective, the Contractor shall be notified to implement revised mitigation measures designed to improve effectiveness.

The Contractor will prepare and implement a complaints protocol for receiving, investigating and addressing construction noise complaints from the public during construction of the proposed rail infrastructure. The protocol will include a plan for how the public is to be notified of their options for lodging a complaint.

The Contractor will install monitoring equipment, as required, to measure and document noise levels at various points to provide empirical data for the assessment of complaints.

Operations and Maintenance

Metrolinx and GO Transit have ongoing inspection schedules to monitor the effectiveness of its operations. A complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.

4.3.8 *Vibration*

4.3.8.1 *Potential Effects*

Construction

It is anticipated that construction associated with installation of the second track and 11 new switches may cause vibration levels at nearby receptor locations to temporarily increase above ambient conditions. The nature of the construction activity within the Barrie rail corridor is such that activities will move along the corridor as construction progresses, and therefore noticeable vibration at any given receptor will be temporary or short term in duration. Activities likely to cause potential vibration effects during installation of the rail infrastructure generally include:

- Demolition of existing structures;
- Breaking of asphalt and concrete through the use of hydraulic hammers or jack hammers; and
- Soil excavation, grading, compaction, and pile driving.

These potential effects will be generally limited to the lands adjacent the Barrie rail corridor, and may be a short term nuisance to affected building occupants.

Operations and Maintenance

The vibration assessment and effects of implementing the BRCE Project are relative to the proximity of sensitive receptors to the proposed second track. The MOECC/GO Draft Protocol does not require the assessment of the frequency or cumulative effect of vibration. Since Future, Scenario 2 will maintain the same number of engines and cars in each train and electric engines are approximately the same weight or less than diesel engines, the vibration velocity (or impacts) will not change between Future, Scenario 1 and Future, Scenario 2. Therefore, the results previously presented in Table 3-52 in Section 3.1.11 are applicable to both Future, Scenario 1 (36 diesel trains) and Future, Scenario 2 (180 electric trains).

The vibration meters were set up at the measurement locations previously identified in Table 3-52. A linear average of the running average RMS vibration velocity of all GO Transit train pass-bys that occurred at each sensitive receptor was calculated. The results of this vibration assessment indicate that the vibration impacts at the sensitive receptors are expected to fall into one of three categories: less than the MOECC/GO Draft Protocol desirable objective level of 0.14 mm/s, less than 25% above the desirable objective level, or more than 25% above the desirable objective level. The potential vibration impacts are expected to be within acceptable ranges for 90 of the 96 sensitive areas. Table 3-52 identified six areas that require further investigation of mitigation measures prior to construction of the BRCE Project (SA008, SA014, SA029, SA035, SA055 and SA057). If the assessment determines that mitigation should be investigated for a representative sensitive receptor, then all of the sensitive receptors within that sensitive area need to be assessed.

A train crossing a switch will generate more vibration than the same train crossing a section of continuous track. In accordance with the Metrolinx-GO Transit Adjacent Development Guidelines (2013), at setbacks beyond 75 metres, vibration is not expected to be significant as previously noted. Therefore, sensitive areas with receptors located within a 75 metres setback from switches will be considered for mitigation prior to construction. The proposed switches associated with the BRCE Project within 75 metres of a sensitive receptor (e.g., four of the eleven switches) are identified in Table 4-7 with their location and shortest setback to a sensitive receptor. Further information is provided in the Noise and Vibration Impact Assessment provided in Appendix H of this EPR.

Table 4-7: Sensitive Receptor Measurements and Mitigation Considered for Switches

Mileage Start	Mileage End	Closest Sensitive Area (SA)	Closest Sensitive Receptor in Sensitive Area (m)	Mitigation Investigation Required?
8.19	8.19	SA015	40 metres to 77 Treelawn Parkway	Yes
17.60	17.76	SA023 (E), SA024 (W)	40 metre both side of the tracks	Yes
51.86	51.86	SA069	51 metres to 1344 Killarney Beach Road	Yes
52.52	52.67	SA069	53 metres to 1106 Corner Avenue	Yes

As summarized in Table 4-7, of the 11 new switches to be constructed, four of them are closer than 75 metres to the nearest sensitive receptor and may experience increased vibration.

4.3.8.2 *Mitigation Measures*

Construction

Construction BMPs will be utilized to minimize any adverse effects from construction vibration at nearby sensitive receptors. These practices include, but are not limited to:

- Deconstruction procedures in lieu of demolition of affected existing structures wherever feasible;
- Refraining from the use of blasting;
- Using saws to break up existing asphalt and concrete instead of hydraulic hammers or jack hammers, wherever possible and practical;
- Using soil compaction techniques that minimize the need for dynamic compaction, or wherever dynamic compaction is necessary, making adjustments to minimize vibrations (e.g., using smaller falling weights); and
- Wherever feasible, design suitable foundations for infrastructure that minimizes the need or extent of pile driving, and wherever pile driving is necessary, use methods that minimize vibrations (e.g., pre-drilling, switching impact with vibratory hammer, using augured cast-in-place piles, drilled shafts, etc.).

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 vibration effects.

Operations and Maintenance

While mitigation was identified from the Vibration assessment, the MOECC/GO Draft Protocol notes that “the requirement to mitigate will be evaluated based on administrative, operational, economic and technical feasibility.” This will be considered prior to construction of the BRCE Project.

Applicable mitigation measures will be investigated prior to Project construction at six of the sensitive receptors which may be affected by operations and maintenance activities. At those locations, the vibration impacts are more than the objective level as they are more than 25% above the existing level. In addition, applicable mitigation measures will be evaluated at four of the new switches that are required as part of the BRCE Project as they are to be installed at less than 75 metres to the nearest sensitive receptor.

4.3.8.3 *Net Effects*

Construction

Construction related vibration impacts will be minimized through implementation of mitigation measures and construction BMPs. As such, no net effects, including damage to neighbouring property or infrastructure, are anticipated.

Operations and Maintenance

No impacts or mitigation measures are required at 90 of the 96 sensitive receptors. At the remaining six sensitive receptors and associated areas, ballast mats or other applicable mitigation measures will be assessed prior to Project construction.

4.3.8.4 *Monitoring Activities*

Construction

Construction activities will be monitored by a qualified Environmental Inspector who will check the effectiveness of the mitigation measures and construction BMPs to confirm they are being employed to minimize any adverse effects from construction vibration at nearby sensitive receptors. In the event that mitigation is found to not be effective, the Contractor will be notified to implement revised mitigation measures designed to improve effectiveness.

In the event that the Contractor or Environmental Inspector notices or is made aware of property or infrastructure damage caused by construction vibration, the Contractor will immediately stop work in the area. The Contractor will develop a restoration plan in consultation with the property or infrastructure owner, and will complete the work using alternative methods to prevent further damage.

The Contractor will prepare and implement a complaints protocol for receiving, investigating and addressing construction vibration complaints from the public during construction of the proposed rail infrastructure. The protocol will include a plan for how the public is to be notified of their options for lodging a complaint.

The Contractor will install monitoring equipment, as required, to measure and document vibration levels at various points to provide empirical data for the assessment of complaints.

Operations and Maintenance

No ongoing monitoring is required during operations and maintenance activities.

4.3.9 *Traffic and Transportation Infrastructure*

4.3.9.1 *Potential Effects*

Construction

For the purposes of the rail infrastructure construction, the majority of the work will occur within the Barrie rail corridor and outside the adjacent road networks. However, in an effort to facilitate construction activities such as deliveries to established laydown areas, excavation removal, for example, construction traffic will be required to travel the road networks of the communities where the construction is occurring. In addition to construction vehicles traveling these roads, the areas for which traffic will be most affected during the rail infrastructure construction will be at the existing corridor crossings within the study limits.

The construction of improvements at existing rail crossings (e.g., additional track, crossing protection upgrades, expansion of existing grade separations) will affect the existing transportation systems in those areas. Temporary lane closures and/or temporary crossing closures may be required to facilitate construction, increasing congestion on the road network and restricting access to homes, businesses and properties. Normal users of the road network will be potentially affected by these construction operations, including cars, delivery trucks, transit buses, school buses, road maintenance vehicles, waste collection vehicles, emergency service vehicles, etc. If there are other works that are scheduled by municipalities on the road network that coincide with the construction of the BRCE Project works the potential effects may be compounded.

Private crossings, including farm crossings, may have access temporarily restricted during construction. Active transportation (pedestrian/cyclist) crossings and adjacent trails will be temporarily disrupted during the construction of the BRCE Project.

Miscellaneous works will also be required to facilitate the expansion of the rail corridor (e.g., ballast, ties, bridges, culverts, noise walls, retaining walls). Construction access to complete these components will have the potential to affect the surrounding road network, transit network and active transportation network.

Operations and Maintenance

The operational modifications to the railway crossings also has the potential to affect traffic operations on the road network, changing travel patterns due to increased delays or physical adjustments to accesses. The increased frequency of vehicle queuing at railway crossings (both during construction and during ultimate operations) has the potential to result in conflicts between train traffic and road traffic in these areas. These effects become more pronounced in areas with high road traffic volumes and high train volumes. In some cases the increased exposure index at these crossings may warrant an upgrading of the warning systems and/or other protection infrastructure.

4.3.9.2 *Mitigation Measures*

Construction

The following mitigation measures will be considered in the design and construction of the crossing upgrades:

- Determine adequate construction hauling routes in consultation with municipalities;
- Preparation and implementation of site-specific Traffic Control and Management Plans to maintain reasonable access through the work zone (e.g., maintain one lane in each direction, where possible);
- Coordination of the works with other planned road projects that may affect traffic in the area;
- Provision of advance notification of the works to municipalities, adjacent owners, transit companies, school bus companies, emergency service providers and the general public, and commitment to consult, review and coordinate with affected parties where required;
- Provide temporary detour routes to avoid the work zone;
- Provide wayfinding signage and travel time alert signage through the work zone;
- Maintain pedestrian/cyclist access through the work zone, as well as vehicular access to homes and businesses, or provide alternate linkages during construction;
- Encourage travel via alternate modes during the construction period;
- Alter work periods/times to minimize traffic disruption during Peak Periods;

- Adjust traffic controls during construction to respond to traffic conditions; and
- Upgrade the crossing warning systems at the crossings to meet Transport Canada's Grade Crossing Standards (2014).

Site-specific Traffic Control and Management Plans will be prepared in accordance with Book 7 (Temporary Conditions) of the OTM prior to the construction phase and implemented during construction to minimize traffic effects. The Traffic Control and Management Plans will include the following as a minimum:

- Minimum lane widths;
- Number of available travel lanes;
- Number, length, and location of temporary right and left-turn lanes;
- Temporary street closures and detour routes;
- Traffic control devices (signing and lane marking);
- Temporary traffic signals and street lighting;
- Temporary pedestrian access and routes;
- Temporary bicycle routes;
- Temporary driveway access;
- Temporary business access; and
- Construction site phasing and staging.

To facilitate traffic flow and mitigate major disruption due to construction, advanced traffic control will extend beyond one arterial street on each side of the construction locations. This will help disperse peak-hour traffic flows onto the adjacent arterial street network. These business owners will be consulted prior to construction to determine access constraints (deliveries, etc.) and this information will be incorporated into the Traffic Control and Management Plans. The need for specific street closures, if required, will be developed in close coordination with the local municipality having jurisdiction throughout the detailed design and prior to construction of the crossing improvements. Traffic management for the BRCE Project will be coordinated with other municipal works that may be active on the road network at the same time, to ensure that conflicts do not arise (e.g., availability of detour routes that are not under coincident construction). Preparation of the site-specific Traffic Control and Management Plans will include review, coordination and consultations with emergency service providers, school bus companies, transit companies and other road users, to coordinate any temporary route diversions or closures, where applicable.

Operations and Maintenance

Where potential traffic queuing issues have been identified on roadways in the area of crossings, it is recommended that the detailed design provide further consideration of additional operational enhancements (e.g., signal pre-emption, pre-signals, queue cutter signals, and/or illuminated "Do Not Stop on Tracks" signs).

Metrolinx has completed a System-Wide Grade Separation Study (December, 2015) separately from the BRCE Project. Metrolinx will conduct further analysis of existing at-grade road crossings, in consultation with affected municipalities, to determine the priority of grade separations. Identified grade separations would require further assessment which would be completed outside of this BRCE TPAP and can be initiated in cooperation with applicable municipalities. For at-grade road crossings, a detailed safety assessment will be prepared in order to provide preliminary screening for improvement requirements.

For minor crossings (private crossings and farm crossings), the warning system requirements will be reviewed with owners prior to construction to discuss potential for closure of the crossing, if possible. Owners will also be notified of rail operations to allow for coordination of crossing times.

For existing at-grade active transportation (pedestrian/cyclist) crossings it is recommended that relocation requirements or upgrades of the crossing warning systems, protection measures or grade separations are further considered, in accordance with Transport Canada's Grade Crossing Standards (July, 2014). Metrolinx will work collaboratively with municipalities to develop customized pedestrian/cyclist policies and warrants for trails crossing, or paralleling the Barrie rail corridor.

4.3.9.3 Net Effects

Construction

After applying the mitigation measures identified above, it is recognized that some net effects may remain from rail infrastructure construction. The delays created by crossing construction cannot be fully mitigated, thus temporarily affecting vehicular traffic and pedestrians/cyclists.

Traffic diversion in the road network may occur due to construction at the crossings and/or due to increased delays at the crossings, once they are operational. This diversion may create congestion elsewhere in the traffic network or may result in traffic infiltration through residential neighbourhoods. In some cases where temporary detours are established to accommodate construction, motorists become accustomed to this established alternate route and continue to utilize this route after construction has been completed and formalized detours removed.

Operations and Maintenance

Queuing and congestion at at-grade crossings will continue to increase as train volumes/frequencies increase and as traffic volumes increase, and cannot be fully mitigated by traffic operational changes. The need to upgrade warning systems and other protection infrastructure at at-grade crossings, or to consider grade separations, will also continue to increase as train and traffic volumes increase. The potential for increased conflict at vehicular crossings and pedestrian/cyclist crossings of railways will also continue to increase as the train and traffic volumes increase.

Given the increased frequency that the various upgraded crossing protection systems will be used as a result of the service increases, operational staff will need to assess and maintain these systems on a more regular basis to ensure that all components are functioning as intended. Should traffic patterns change as a result of BRCE Project construction, detours, etc., this may result in increased demand on adjacent roads within the network that were not constructed to meet expanded traffic volumes.

4.3.9.4 *Monitoring Activities*

Construction

Construction inspection is expected to ensure that the approved designs and site-specific Traffic Control and Management Plans are effectively implemented, and the prescribed mitigation measures are working as planned. Revisions to the Plans are recommended to adapt to shifts in traffic patterns due to the BRCE Project or adjacent municipal road projects.

Operations and Maintenance

Once the upgraded at-grade road crossings are operational, Metrolinx and the municipalities will periodically monitor the exposure index and safety at these crossings, reassessing the warning system and protection requirements. For trail crossings, Metrolinx and the trail authorities/municipalities will monitor trail operations and develop a screening methodology to assess future upgrade requirements.

For farm crossings, Metrolinx will continue to periodically monitor the exposure index and safety, as service levels increase, reassessing warning systems and the potential for closure of these crossings, where possible in collaboration with the owners.

For expanded existing grade separations, Metrolinx will be required to continue to inspect and maintain their structures.

4.3.10 *Utilities and Municipal Infrastructure*

4.3.10.1 *Potential Effects*

Construction

For the purposes of the rail infrastructure construction, the majority of the work will occur within the Barrie rail corridor. The utilities and municipal infrastructure identified and summarized in Section 3.1.13 were assessed to determine whether the proposed rail infrastructure works would affect each utility running parallel or crossing the rail corridor. Table 4-8 provides a summary of the utilities and municipal infrastructure that are either unaffected by the rail infrastructure, have low potential to be affected (to be confirmed prior to the construction phase), are to be protected in place, or relocated or removed to avoid the effect.

Operations and Maintenance

No effects are anticipated during operations and maintenance.

4.3.10.2 *Mitigation Measures*

Construction

Mitigation measures will be further reviewed prior to construction for known utility/infrastructure crossings and utilities/infrastructure running along the corridor in coordination with the utility owner. The following mitigation measures will be considered further prior to the construction phase:

Protect – The utilities/infrastructure are left in place and protected through barriers and other methods while construction occurs around them; or

Relocation/Remove – Utilities/infrastructure are rerouted around the area of construction in cases where utilities are active or removed in cases where the utility is abandoned.

Operations and Maintenance

No mitigation is required during operations and maintenance.

4.3.10.3 *Net Effects*

Construction

No net effects are expected with respect to utilities.

Operations and Maintenance

No net effects are expected with respect to utilities.

4.3.10.4 *Monitoring Activities*

Construction

Monitoring of utility/infrastructure relocation and protection will be in accordance with the utility/infrastructure owner's protocols.

Operations and Maintenance

No monitoring is required.

Table 4-8: Utility and Municipal Infrastructure Effects

		Sewer	WM	Telecom	Gas/Oil	Hydro	Overhead	MX/CNR	Others
City of Toronto- Mile 3.00 to 12.90	No conflict	16	15	17	11	9	24	12	1
	Low Potential	11	8	1	8	0	8	1	0
	Protect	0	0	28	13	8	2	9	0
	Relocation/ Remove	0	0	3	0	0	4	14	0
City of Vaughan- Mile 12.90 to 22.5	No conflict	2	2	2	3	0	0	7	0
	Low Potential	5	7	1	1	0	7	0	0
	Protect	0	0	11	3	1	1	0	0
	Relocation/ Remove	1	0	0	0	0	0	0	0
Township of King- Part I Mile 22.5 to 26.49	No conflict	1	1	0	0	0	3	3	0
	Low Potential	8	4	0	0	0	2	0	0
	Protect	1	0	6	4	0	1	5	0
	Relocation/ Remove	1	0	0	0	0	0	2	0
	No conflict	0	0	0	0	0	0	0	0

		Sewer	WM	Telecom	Gas/Oil	Hydro	Overhead	MX/CNR	Others
Township of King- Part II Mile 39.66 to 40.99	Low Potential	0	2	0	1	0	0	0	0
	Protect	0	0	9	2	0	0	0	0
	Relocation/ Remove	0	0	0	0	0	0	0	0
Town of Aurora- Mile 26.49 to 31.50	No conflict	1	1	0	1	0	1	3	0
	Low Potential	3	14	0	0	0	9	0	0
	Protect	0	0	15	4	1	0	8	0
	Relocation/ Remove	4	0	1	0	0	0	5	0
Town of Newmarket- Mile 31.50 to 35.37	No conflict	0	0	0	1	0	0	7	0
	Low Potential	25	11	0	0	0	14	0	0
	Protect	2	0	2	4	2	0	15	0
	Relocation/ Remove	0	0	0	0	0	0	9	0
Town of East Gwillimbury- Mile 35.37 to 39.66	No conflict	0	0	0	0	0	0	1	0
	Low Potential	6	3	0	0	0	2	0	0
	Protect	0	0	16	6	0	0	2	0
	Relocation/ Remove	0	0	0	0	0	0	0	0
Town of Bradford West Gwillimbury- Mile 40.99 to 47.72	No conflict	0	0	0	0	0	0	0	0
	Low Potential	5	3	0	3	0	0	0	0
	Protect	0	0	10	0	1	0	0	0
	Relocation/ Remove	0	0	0	0	0	0	0	0
Town of Innisfil- Mile 47.72 to 58.45	No conflict	0	0	0	0	0	0	0	0
	Low Potential	5	2	0	6	0	5	0	0
	Protect	0	0	20	1	0	0	0	0
	Relocation/ Remove	0	0	0	0	0	0	0	0
City of Barrie- Mile 58.45 to 63	No conflict	0	0	2	0	0	1	0	0
	Low Potential	40	10	0	7	5	4	0	0
	Protect	0	0	14	0	0	2	0	0
	Relocation/ Remove	0	0	0	0	0	0	0	0
	No conflict	20	19	21	16	9	29	33	1
	Low Potential	108	64	2	26	5	51	1	0
Total for Mile 3.00 to Mile 63.00	Protect	3	0	131	37	13	6	39	0
	Relocation/ Remove	6	0	4	0	0	4	30	0

Notes:

[1] MX/CNR – Metrolinx and CN Track signal cables

4.4 GO Station Improvements

4.4.1 Wildlife, Terrestrial Habitat, Aquatic Habitat, and Significant Natural Areas

4.4.1.1 Potential Effects

Pre-Construction Land Clearing/Property Acquisition

Significant Natural Areas: Construction of the GO Station improvements will result in a larger footprint to accommodate the new platforms, tunnels, and other associated structures. As a result, portions of the following Significant Natural Areas will be lost:

- Unevaluated wetlands;
- Significant Woodlands; and
- Significant Valleylands.

A summary of the Significant Natural Areas to be removed (lost) is provided in Table 4-9.

Construction laydown areas and easements will be identified prior to Project construction. There is potential that these areas may result in the loss of or disturbance to, all natural area types present within the study area.

Wildlife Habitat: A number of Candidate and Confirmed SWHs and Habitats of SCC are located within the Significant Natural Areas described in detail within the NER provided in Appendix A of this EPR. An additional 0.81 ha of habitat is present within open woodland, meadow and thicket communities outside of Significant Natural Areas. Table 4-9 provides a summary, while additional details can be found within the NER.

Species at Risk: A number of areas identified as Candidate Habitat of Endangered and Threatened Species will be cleared. These areas may provide a wildlife habitat function but their significance has not been confirmed. A summary is provided in Table 4-9.

Nests of Migratory Birds: Nests could be harmed or destroyed as a result of vegetation clearing. This is in contravention of the MBCA, 1994.

Additional Trees at King City GO Station: A total of 32 tree removals, were required in winter 2015/2016 to accommodate the construction of a new parking lot for the King City GO Station at a former residential property (55 Station Road). A compensation strategy was developed in consultation with the TRCA and a total of 96 trees were needed to compensate the removals based on this strategy, of which 35 were added

to the vegetative buffer on-site, as designed in the Landscape Plan. The remaining trees that could not be compensated on-site through a Landscape Plan of the 55 Station Road site have been carried forward as a compensation obligation for the BRCE Project to be compensated on adjacent lands subject to consultation with the conservation authority and municipalities. These additional compensation trees will be considered further in compensation discussions with the TRCA throughout the detailed design and prior to construction. Additional details can be found in the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR.

Table 4-9: Summary of Natural Area to be Removed to Accommodate the GO Station Improvements

GO Station	Significant and Candidate Significant Natural Features	Area to be Removed (ha)
Rutherford	Significant Natural Area, including overlapping areas: Significant Woodlands; Significant Valleylands; Candidate Habitat of SCC (Eastern Wood Peewee, Wood Thrush); and Candidate Habitat of Endangered and Threatened Species (Bat Habitat).	0.19
	Significant Natural Area, including overlapping areas: Unevaluated Wetlands; Significant Valleylands; Candidate SWH (Waterfowl Stopover and Staging Areas, Marsh Bird Breeding Habitat); and Candidate Habitat of SCC (Painted Skimmer, Green-striped Darner).	0.19
Maple	No Significant Natural Features.	Not applicable
King City	No Significant Natural Features.[1]	Not applicable
Aurora	No Significant Natural Features.	Not applicable
Newmarket	No Significant Natural Features.	Not applicable
East Gwillimbury	Significant Valleyland (East Holland River).	0.47
Bradford	Wildlife Habitats outside of Significant Natural Areas: Candidate Habitat for SCC (Eastern Wood Peewee, Red-headed Woodpecker, Golden-winged Warbler).	0.43
	Wildlife Habitats outside of Significant Natural Areas: Drainage feature (part of Holland Marsh drainage system), providing Candidate Habitat for Endangered and Threatened Species (Blanding's Turtle, King Rail, Least Bittern).	0.002
Barrie South	Wildlife Habitats outside of Significant Natural Areas: Candidate SWH (Shrub/Early Successional Bird Breeding Habitat); and Candidate Habitat for SCC (Red-headed Woodpecker, Golden-winged Warbler).	0.35
	Wildlife Habitats outside of Significant Natural Areas: Candidate Habitat for SCC (Red-headed Woodpecker, Golden-winged Warbler).	0.03
Allandale Waterfront	No Significant Natural Features.	Not applicable

[1] Significant Natural Features are present within the vicinity of this station but will be removed as a result of the rail infrastructure and not the GO Station.

Construction

Significant Natural Areas, Wildlife Habitat and Species at Risk: All Significant Natural Areas and Significant and Candidate SWH, Habitat of SCC, and Habitat of Endangered and Threatened Species could be affected during construction as follows:

- Grading and soil disturbance during construction can lead to erosion and sedimentation within significant natural features and watercourses. This can affect the quality of habitat, disturb ground vegetation, and negatively affect the quality of fish habitat;
- Stockpiled materials, equipment or construction activities could accidentally encroach into natural areas beyond the proposed ROW limits. This could add to the disturbance to natural features and increase the quantity lost as a result of the BRCE Project. Soils beyond the proposed ROW limits could also become compacted or disturbed if activities extend beyond the approved Project limits;
- 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 and the health of vegetation and wildlife within natural areas;
- Any disturbance to lands and vegetation clearing has the potential to allow invasive species to be introduced and spread through natural areas. Invasive species can prevent other native species from re-establishing;
- Tunnels will be constructed at each GO Station to allow passengers to safely cross the corridor to access new platforms. Tunneling will require dewatering and the discharge of that water to the environment. Dewatering may be required for other subsurface work; and
- Dust created as a result of construction has the potential to settle on adjacent vegetation, disturbing wildlife and their habitat.

Significant Valleylands: There is a Significant Valleyland associated with Westminster Creek at the Rutherford GO Station. The valley feature 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: It is noted that fish habitat is present at the Rutherford, King City, East Gwillimbury and Bradford GO Stations. Thus, new platforms may result in the need to extend culverts or to carry out construction activities in, and around, water. This work has the potential to harm fish habitat.

Operations and Maintenance

Significant Natural Areas, Wildlife Habitat and Species at Risk: All Significant Natural Areas and Significant and Candidate SWH, Habitat of SCC, and Habitat of Endangered and Threatened Species could be affected by operations and maintenance activities, as follows:

- Any grading or earth moving required for maintenance purposes can result in sedimentation within adjacent natural features, degrading habitats and harming vegetation and wildlife;
- Work will be undertaken to keep areas around the GO Stations clear and free of any vegetation that could disrupt sight lines or interrupt the movement of train traffic. Trees adjacent to the GO Stations may need to be trimmed and any new vegetation may need to be cleared. Trimming has the potential to harm healthy trees and allow disease or rot to expand. Any use of chemical pesticides to maintain GO Station areas also has the potential to affect groundwater and adjacent natural features if not applied correctly; and
- Spills of fuel and other hazardous materials 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.

4.4.1.2 *Mitigation Measures*

Pre-Construction Land Clearing/Property Acquisition

Mitigation measures were developed to address each of the potential effects associated with the improvements at the nine GO Stations, as follows:

Significant Natural Areas: Mitigation will be implemented as follows:

- A qualified Environmental Inspector is required throughout the construction period to ensure that protection measures are implemented, maintained and enforced;
- Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects;
- Clearing and grubbing will occur from the track-side of the natural area and a detailed ESC Plan will be developed to limit damage to the remaining natural areas;
- 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; and
- Detailed clearing, ESC Plans and restoration plans will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects and approved Landscaping Plans developed prior to Project construction.

In wetlands:

- Wetlands will be restored as necessary to maintain the stability and function of the wetland and will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects and approved Landscaping 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 plywood clad boarding or an equivalent material approved by the affected municipality;
- 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; 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.

Wildlife Habitat: Mitigation will be implemented as follows:

- Any vegetation clearing will take place outside of the breeding bird timing window, generally April 1st to August 31st;
- If clearing must occur within this window, a qualified Ecologist/Avian Biologist will first search the affected area. Any active nest 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 ESA, 2007) is identified within or adjacent to the construction site, all activities will stop and the Contractor (with assistance from a qualified Ecologist) shall discuss mitigation measures with Metrolinx – Environment Program and Assessment Department staff. In addition, Metrolinx will consult with 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;
- Compensation for habitats located within Natural Areas will follow the mitigation measures detailed under Significant Natural Areas within the NER provided in Appendix A of this EPR;
- Where habitats do not coincide with a Significant Natural Area, compensation measures will be developed, as appropriate. Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects; and
- Habitats with a critical timing window at a different time of year (e.g., early spring migration and wintering habitats) will be assessed by a qualified Ecologist/Avian Biologist prior to any clearing to confirm that the habitat is not in use. If the habitat is being used for critical life functions (e.g., nesting, migration stopover, hibernation, overwintering), the area will be flagged and all clearing within the associated habitat will be avoided until the area is no longer in use. These additional timing windows are listed in Table 4-3. Specific habitats that require inspection during these times are listed in the NER.

Species at Risk: Mitigation 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:
  - King Rail;
  - Least Bittern;
  - Eastern Whip-poor-will;
  - Blanding's Turtle; and
  - Little Brown Myotis, Northern Myotis, and Tri-colored Bat.
- Findings of field surveys will be reported to the MNRF;
- During the detailed design phase, the GO Station improvements 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 consulted and all requirements under the ESA, 2007, 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
- 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 consulted.

Nests of Migratory Birds: Mitigation will be implemented as follows:

- Any vegetation clearing will take place outside of the breeding bird timing window, generally from April 1st to August 31st;
- 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 Ecologist/Avian Biologist confirms that the birds have fledged and the nest is no longer active; and
- If a nesting migratory bird (or SAR protected under ESA, 2007) is identified within or adjacent to the construction site, all activities will stop and the Contractor (with assistance from a qualified Ecologist) shall discuss mitigation measures with Metrolinx - Environment Program and Assessment Department staff. In addition, Metrolinx will consult with 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.

Additional Trees at King City GO Station: There are 61 trees that could not be accommodated and compensated on-site as part of the 55 Station Road parking lot expansion Landscape Plan at the King City GO Station. These have been carried forward as a compensation obligation for the BRCE Project, and will be addressed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.

Construction

Significant Natural Areas, Wildlife Habitat and Species at Risk: Mitigation will be implemented as follows:

- A qualified Environmental Inspector is required throughout the construction period to ensure that protection measures are implemented, maintained and enforced.
- 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.
- An ESC Plan will be developed prior to construction in consultation with the TRCA and LSRCA 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);
- 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;
- ESC and dewatering measures will be implemented prior to 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 of the construction site will be stabilized and re-vegetated as soon as conditions allow;
- ESC measures will be left in place until all areas of the construction site have been stabilized and will then be removed;
- Wet weather restrictions shall be applied during site preparation and excavation. Work will be avoided near watercourses during periods of excessive precipitation and/or excessive snow melt;
- A Construction Emergency Response and Communications Plan will be developed prior to construction and followed throughout the construction phase (includes spill response plans);
- 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;
- Dust from the work areas will be controlled through suppressants (e.g., water);
- Deleterious substances (including stockpiled material) will be used and stored in a manner that prevents any of the substances from entering a natural feature;
- 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. 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; and

- The Contractor will develop spill prevention and contingency plans and have them in place prior to construction of the BRCE 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 watercourses or 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* will be met, including the following mitigation measures:

- All disturbed areas of 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; and
- If extensive invasion of non-native species is identified as a result of the BRCE Project, contingency measures may include an applicable herbicide application. A herbicide application plan will be developed as required and submitted to the applicable conservation authority for review.

All requirements under the OWRA, R.S.O. 1990, c. O.40 with respect to the quality of water discharging into natural receivers will be met, including the following mitigation measures and best practices:

- 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.

Significant Valleylands: Mitigation will be implemented as follows:

- Geotechnical studies will be completed prior to Project construction to identify any design and mitigation requirements in, and around, Valleylands;
- Detailed design plans will be submitted to the TRCA and LSRCA for voluntary review in order to confirm that all work is in compliance with O. Reg. 166/06 and 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: Mitigation will be implemented as follows:

- All in-water work will be conducted in accordance with the timing windows to be determined in the Aquatic Habitat Assessment to be completed prior to Project construction;
- 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;
- An Aquatic Habitat Assessment will be prepared prior to Project construction to identify specific effects and mitigation measures associated with detailed culvert and bridge design plans; and
- All requirements under the *Fisheries Act* will be met including any Self-Assessments or permitting.

Operations and Maintenance

Significant Natural Areas, Wildlife Habitat and Species at Risk: Mitigation will be implemented as follows:

- Any major maintenance work that would result in the replacement or upgrade of major infrastructure components requiring earth-moving or in-water 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 Station 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 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 watercourses or 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.

4.4.1.3 Net Effects

Pre-Construction Land Clearing/Property Acquisition

Significant Natural Areas: There will be reduced on-site vegetation but an overall increase in natural areas through off-site compensation. As such, in the long-term there will be no net effects.

Wildlife Habitat: There will be reduced on-site wildlife habitat but an overall increase in habitat through off-site compensation. As such, in the long-term there will be no net effects.

Species at Risk: All requirements under the ESA, 2007, will be met, thus no net effects are anticipated.

Nests of Migratory Birds: With implementation of the recommended mitigation, no net effects are anticipated.

Additional Trees at King City GO Station: Planting of the required trees will result in an overall long-term gain. As such, in the long-term there will be no net effects.

Construction

Significant Natural Areas, Wildlife Habitat and Species at Risk: Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. Metrolinx will work in accordance with the requirements of the *Invasive Species Act*. All dewatering will be conducted in accordance with regulatory requirements. As such, no net effects are anticipated.

Significant Valleylands: All requirements for working in proximity to steep slopes and watercourses will be met. Metrolinx will continue to consult with the TRCA/LSRCA prior to Project construction and throughout future construction phases. No net effects are anticipated.

Fish Habitat: All in-water and near-water works will be completed in accordance with the requirements of the *Fisheries Act* and construction industry BMPs. Therefore, no net effects are anticipated.

Operations and Maintenance

Significant Natural Areas, Wildlife Habitat and Species at Risk: Vegetation trimming is not expected to have any significant effects. Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.

4.4.1.4 Monitoring Activities

Pre-Construction Land Clearing/Property Acquisition

Significant Natural Areas: The following monitoring will be applied:

- Pre-construction land clearing activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within 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.

Wildlife Habitat: the following monitoring will be applied:

- An 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
- 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, 2007.

Nests of Migratory Birds: An Environmental Inspector will regularly monitor construction to confirm that activities do not encroach into nesting areas or disturb active nesting sites.

Additional Trees at King City GO Station: The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.

Construction

Significant Natural Areas, Wildlife Habitat and Species at Risk: The following monitoring will be applied:

- An Environmental Inspector will conduct regular inspections to confirm ESC measures are functioning properly and are properly maintained throughout the construction phase;
- An 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 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% survival rate and confirm that non-native and invasive species are not becoming pervasive as a result of the BRCE 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 or watercourse;

- An Environmental Inspector will regularly inspect dust emissions during construction to confirm dust control watering frequency and rates are adequate.

Significant Valleylands: An Environmental Inspector will conduct regular inspections to confirm that all work is conducted in accordance with plans and any recommendations provided through the conservation authority voluntary review.

Fish Habitat: An Environmental Inspector will conduct regular inspections to confirm that all work is conducted in accordance with the *Fisheries Act* and any associated permits/approvals.

Operations and Maintenance

Significant Natural Areas, Wildlife Habitats and Species at Risk*:* The following monitoring 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.

4.4.2 Trees

4.4.2.1 Potential Effects

Construction

Tree removals will be required to accommodate the improvements at the nine existing GO Stations as part of the BRCE Project. The number of trees to be removed at each of the GO Stations are presented in Table 4-10. Calculation of these removals was estimated using aerial photography and field notes due to access restrictions. There are no improvements proposed at York University GO Station (City of Toronto) and therefore no tree removals are required.

For the King City GO Station, in addition to the total removals required for the proposed station improvements noted in Table 4-10, there were 32 trees that required removal to accommodate the construction of a new parking lot at a former residential property (55 Station Road). For more details on the King City GO Station parking lot expansion refer to the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR.

Operations and Maintenance

Deterioration of trees' vitality that are adjacent to the GO Stations over time due to new growing conditions for the trees (e.g., sunscald).

Table 4-10: Tree Removals Summary to Accommodate GO Station Improvements

Municipality	Feature	Mileage	Tree Removals Totals[1]
City of Vaughan	Rutherford GO Station Existing ROW	16.58 – 16.60	3
	Rutherford GO Station Proposed ROW	16.58 – 16.60	15
	Maple GO Station Existing ROW	18.21 – 18.42	0
	Maple GO Station Proposed ROW	18.21 – 18.42	0
Township of King	King City GO Station Existing ROW	22.49 – 22.70	30
	King City GO Station Proposed ROW	22.49 – 22.70	0
Town of Aurora	Aurora GO Station Existing ROW	29.71 – 29.96	0
	Aurora GO Station Proposed ROW	29.71 – 29.96	0
Town of Newmarket	Newmarket GO Station Existing ROW	34.18 – 34.40	41
	Newmarket GO Station Proposed ROW	34.18 – 34.40	71
Town of East Gwillimbury	East Gwillimbury GO Station Existing ROW	35.34 – 35.58	0
	East Gwillimbury GO Station Proposed ROW	35.34 – 35.58	0
Town of Bradford West Gwillimbury	Bradford GO Station Existing ROW	41.44 – 41.59	0
	Bradford GO Station Proposed ROW	41.44 – 41.59	20
City of Barrie	Barrie GO South Station Existing ROW	59.30 – 59.55	0
	Barrie GO South Station Proposed ROW	59.30 – 59.55	114
	Allandale Waterfront GO Station Existing ROW	58.37 – 63.00	0
	Allandale Waterfront GO Station Proposed ROW	58.37 – 63.00	0
		TOTAL (approximate)	**294**

[1] *Removals are estimated from aerial photography and therefore cannot be divided into the four categories of trees. Access was limited to the Barrie rail corridor land at the time of this study.*

4.4.2.2 Mitigation Measures

Construction

Where tree permits are required on municipal land or private property adjacent to the ROW, Metrolinx will work with authorities as necessary to obtain all applicable permits and approvals. As an ongoing measure, Metrolinx is also currently consulting with conservation authorities and municipalities to establish a Vegetation Compensation Protocol for Metrolinx RER Projects. 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. The goal is to reduce administrative permitting burden for trees affected within long stretches of the rail corridor.

For Trees within Metrolinx Property: Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property. This will involve categorizing trees by community type/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with applicable conservation authorities and affected municipalities to develop the final compensation plan.

Conservation Authorities: For vegetation removals within conservation authority lands where required, applicable removal and restoration requirements will be followed.

Federal lands: For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements will be followed.

Tree End Use: Metrolinx will develop options for the end use of trees removed from Metrolinx property (e.g., reuse/recycling options).

This Vegetation Compensation Protocol will be required for tree removals for the station improvements proposed at the Rutherford, King City, Newmarket, Bradford and Barrie South GO Stations. Tree removals are not required for station improvements at the Maple, Aurora, East Gwillimbury and Allandale Waterfront GO Stations.

Furthermore, there are 61 trees that could not be accommodated and compensated on-site as part of the 55 Station Road parking lot expansion Landscape Plan at the King City GO Station. These have been carried forward as a compensation obligation for the BRCE Project.

A Certified Arborist will complete an assessment of trees within and on lands immediately adjacent to the ROW prior to construction to determine required setbacks and protection measures. This will determine the total number of trees removals required and determine extent of impacts to off-site trees.

The TPZ and barriers must be implemented prior to commencement of construction around retained trees to prevent damage or removal. The Environmental Inspector will regularly monitor the state of the TPZ.

A Certified Arborist will inspect and assess the newly created edge of wooded features prior to commencement of use of the new station improvements to identify hazardous limbs and trees for removal to prevent injury or damage to people and property.

In locations where trees will be preserved but injuries are anticipated (e.g., root severance), mitigative measures carried out by or under the direction of a Certified Arborist will occur (e.g., root pruning) in coordination with the construction.

Operations and Maintenance

Maintenance, seasonal pruning or removal may be required to prevent woody material from falling onto the rail corridor. If a tree belonging to an adjacent landowner has failed as result of the implementation of the BRCE Project, tree replacement may be required as compensation.

4.4.2.3 *Net Effects*

Construction

Where on-site compensation cannot be accomplished within the Landscape Plans, Metrolinx will work with the applicable conservation authorities and municipal agencies to explore off-site compensation. The Vegetation Compensation Protocol for Metrolinx RER projects to be determined between Metrolinx, conservation authorities, and municipalities will be applied to offset the loss of tree canopy.

Operations and Maintenance

Tree canopy will be reduced until compensation plantings become established and can replace or enhance the canopy coverage.

4.4.2.4 *Monitoring Activities*

Construction

A qualified Environmental Inspector is required throughout the construction period to ensure that protection measures are implemented, maintained and enforced. These personnel will implement tree protection plans, monitor construction for unauthorized encroachment by contractors into vegetated areas and TPZs and monitor silt fencing and/or tree protection barriers to ensure proper installation and functionality. This will ensure that effects to protected trees and off-site lands are protected for the duration of the construction. If the silt fencing and tree protection are not functioning, alternative measures will be implemented and prioritized above other construction activities. A post-construction assessment of the trees adjacent to the construction zone by a Certified Arborist is recommended to occur.

The Contractor that installs the edge management, landscape, mitigation and/or compensation plantings is responsible for monitoring establishment success and tending to the plant material as site conditions (e.g., drought conditions) require for the length of the warranty period. A Landscape Architect (licensed to practice in the province of Ontario) or qualified designate will be required to confirm the success of plant establishment through warranty inspections.

Inspections by a Certified Arborist may be required through the construction period to identify dead trees or limbs adjacent to the ROW.

Operations and Maintenance

Metrolinx routine inspections will identify dead trees or limbs adjacent to GO Stations in order for the maintenance and reduction of risk.

A Certified Arborist will inspect and assess trees on-site and on lands immediately adjacent annually (at minimum) from the Metrolinx property.

4.4.3 Archaeological Resources

4.4.3.1 Potential Effects

Construction

During the construction phase of the BRCE Project, it is possible that land clearing activities required to prepare for the construction of the GO Station improvements could impact potential archaeological resources, including the following:

At the Barrie South GO Station:

- The Heritage Glen site (referenced as Borden #BcGv-20 in the Stage 1 Archaeological Assessment), an ancestral Huron-Wendat village site.

At the Allandale Waterfront GO Station:

- The Allandale site (referenced as Borden #BcGw-69 in the Stage 1 Archaeological Assessment), an ancestral Huron-Wendat village and ossuary.

As shown on Figures 32 to 53 in the Stage 1 Archaeological Assessment provided in Appendix C of this EPR, there are various zones of archaeological potential located in the vicinity of the following GO Stations:

- King City GO Station;
- Aurora GO Station;
- Newmarket GO Station;
- East Gwillimbury GO Station;
- Bradford GO Station;
- Barrie South GO Station; and
- Allandale Waterfront GO Station.

The presence and/or extent of these features have not been confirmed and thus the effects are not fully understood at this time. Additional study requirements are noted in Section 4.4.3.2.

Operations and Maintenance

No potential effects are anticipated to archaeological resources during the operations and maintenance phase.

4.4.3.2 Mitigation Measures

Construction

With regard to the Heritage Glen site (Borden #BcGv-20), mitigation will be applied and/or additional studies will be completed in order to confirm mitigation requirements, as follows:

A Stage 2 Archaeological Assessment will be required prior to any land disturbing activities in the affected areas determined to have archaeological potential in the Stage 1 Archaeological Assessment. The Stage 2 Archaeological Assessment will involve a pedestrian or test pit survey to further define areas of archaeological potential and determine whether further studies or mitigation measures are required. Accordingly, depending on the results of the Stage 2 Archaeological Assessment, there is a possibility that further (Stage 3) Archaeological Assessment (with Indigenous engagement) and, ultimately, Stage 4 Protection/Avoidance of the Allandale site will be recommended. This requires that a licenced consultant archaeologist monitor the construction activities to ensure there are no effects to the site during construction. If the site cannot be fully protected and avoided, then some archaeological mitigation through salvage excavation, with Indigenous engagement, may also be required. Any mitigation developed as a result of further studies will be reviewed and confirmed with MTCS prior to construction.

With regard to the Allandale Station site (Borden #BcGw-69), mitigation will be applied and/or additional studies will be completed in order to confirm mitigation requirements, as follows:

To minimize the risk of impacting an ossuary during construction of the BRCE Project, a licenced consultant archaeologist will be present to monitor the removal of topsoil for all lands within the study area identified to possess potential for an ancestral Huron-Wendat ossuary[29]. The methodology of this investigation will proceed as outlined in Section 4.3.3 for Cemetery Investigations.

The Allandale site (BcGw-69) is considered to possess CHVI and is situated adjacent to the proposed Future Phase(s) study area in the vicinity of the Allandale GO Station[30]. Any potential effects at this highly significant site initially require a Stage 2 Archaeological Assessment in an effort to better define the archaeological integrity and limits of the site. Previous archaeological assessments of the site have been of limited scope and have not fully characterized the nature and extent of the archaeological deposits. Accordingly, depending on the results of the Stage 2 Archaeological Assessment, there is a possibility that further (Stage 3) Archaeological Assessment (with Indigenous engagement) and, ultimately, Stage 4 Protection/Avoidance of the Allandale site will be recommended. This requires that a licenced consultant archaeologist monitor the construction activities to ensure there are no effects to the site during construction. If the site cannot be fully protected and avoided, then some archaeological mitigation through salvage excavation, with Indigenous engagement, may also be required. Any mitigation developed as a result of further studies will be reviewed and confirmed with MTCS prior to construction.

Due to the previously documented evidence of disturbed human remains on the Allandale Station site, archaeological monitoring of any proposed effect on this site as well as to any crawl spaces or soils beneath existing structures without basements are recommended.

With regard to the various zones of archaeological potential shown on Figures 32 to 53 in the Stage 1 Archaeological Assessment provided in Appendix C of this EPR, mitigation will be applied and/or additional studies will be completed in order to confirm mitigation requirements, as follows:

A Stage 2 Archaeological Assessment will be required prior to any land disturbing activities in the affected areas determined to have archaeological potential in the Stage 1 Archaeological Assessment. The Stage 2 Archaeological Assessment will involve a pedestrian or test pit survey to further define areas of

[29] *Due to the sensitivity of this feature, its location is not presented in this Report.*

[30] *Due to the sensitivity of this feature, its location is not presented in this Report.*

archaeological potential and determine whether further studies or mitigation measures are required. The affected GO Stations within the study area requiring Stage 2 Archaeological Assessment include:

- King City GO Station;
- Aurora GO Station;
- Newmarket GO Station;
- East Gwillimbury GO Station;
- Bradford GO Station;
- Barrie South GO Station Expansion (including areas in the vicinity of the registered Heritage Glen site); and
- Allandale Waterfront GO Station Expansion (including areas in the vicinity of the registered Allandale site).

In the event that previously undocumented archaeological remains are found during land-disturbing activities, the proponent or person discovering the archaeological resources will cease alteration of the site immediately, and the licenced consultant archaeologist, approval authority, and the Cultural Programs Unit of the MTCS will be immediately notified. In the event that human remains are discovered, then local law enforcement (e.g., local police force or the Ontario Provincial Police) and the Office of the Chief Coroner for Ontario will be immediately notified to review the discoveries and confirm that the site is not of forensic interest. Non-forensic findings will be subsequently communicated to the Cemeteries Registrar. Excavation will continue within the study area until a sterile 10 metres buffer is identified between the limit of excavation and any identified burials. Any documented human remains will be subjected to protection and avoidance by effects proposed by the BRCE Project.

If prior to construction it is confirmed that the BRCE Project extends beyond the currently identified study area, then further Stage 1 Archaeological Assessment (Background Study and Property Inspection) will be conducted to determine the archaeological potential of the affected lands.

Operations and Maintenance

No mitigation measures are required.

4.4.3.3 *Net Effects*

Construction

Upon implementation of the mitigation and monitoring measures recommended for the BRCE Project by the licenced consultant archaeologist (licensed to practice in the province of Ontario), no net effects related to archaeological resources are anticipated.

Operations and Maintenance

No net effects to archaeological resources are anticipated during the operations and maintenance phase.

4.4.3.4 *Monitoring Activities*

Construction

The Environmental Inspector shall monitor land-disturbing activities to confirm they remain within the study area subject to the archaeological assessment(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

No monitoring activities are required.

4.4.4 *Cultural Heritage Resources*

4.4.4.1 *Potential Effects*

Construction

Construction activities associated with the GO Station improvements could potentially impact the heritage attributes of the screened CHRs in Table 3-60. 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.

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 GO Station improvements is provided in Table 4-11.

The following CHRs will be directly affected through building removal or alteration:

- PHP:
  - Bradford GO Station (Mile 41.60).
- Conditional PHP:
  - 91 Franklin Street (Mile 34.44).

The following CHRs may be indirectly affected by the GO Station improvements:

- PHPPS:
  - Aurora GO Station, PHPPS (Mile 29.90).
- PHP:
  - Maple GO Station (Mile 18.28).

- Conditional PHP:
  - Newmarket GO Station/Tannery Mall (Mile 34.35).
- Adjacent Properties:
  - Maple Village HCD, Designated, Part V OHA (Mile18.10-18.30); and
  - Former Allandale Train Station (Mile 63.00).

Operations and Maintenance

No potential effects to CHRs are anticipated during the operations and maintenance phase of the BRCE Project.

4.4.4.2 *Mitigation Measures*

Construction

As a result of indirect effects at the Aurora GO Station (known PHPPS) a HIA was completed. The HIA identified the potential effects listed in Table 4-12 and prescribed the corresponding mitigation measures. In summary, Metrolinx will undertake the following mitigation measures at the Aurora GO Station:

- If it has not been addressed in advance, repaving the platform provides the opportunity to undertake the repair of the deteriorating wood base of the station building;
- New platform shelters should be placed away from sightlines to the station building as much as possible while respecting the building's functional link to the railway. Their design should adhere to the Metrolinx Design Excellence Guidelines and the guidelines specific to the Aurora GO Station; and
- New stair enclosures, elevators and partial platform canopies at the north tunnel should be placed away from sightlines to the station building as much as possible while respecting the building's functional link to the railway tracks. Their design should adhere to the Metrolinx Design Excellence Guidelines and the guidelines specific to the Aurora GO Station. The location of the northeast stair enclosure must consider potential impacts to the footing of the station building portico and the foundation of the building, including its angle of repose, through geotechnical study. The caisson wall indicated as a solution to protect the railway bed could be extended to isolate and protect the station building. A comprehensive protection plan should be established for the station building to mitigate any impact from Project construction, such as incidental contact from machine operations which could damage the structure or the finishes. It should include a protective zone around the building.

New and replacement lighting, public address, CCTV and fare systems should be placed away from sightlines to the station building as much as possible while respecting the building's functional link to the railway. Their design should adhere to the Metrolinx Design Excellence Guidelines and the guidelines specific to the Aurora GO Station.

For the two remaining properties directly affected (91 Franklin Street and the Bradford GO Station) a HIA will be completed prior to Project construction (e.g., during the detailed design phase). The HIAs will be completed in accordance with the MTCS Standards and Guidelines, and will be developed in consultation with, and submitted for review to, the MTCS and other heritage stakeholders (municipal planners and/or municipal heritage committee). The HIAs 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 HIAs will also make recommendations to minimize or mitigate adverse effects on the property resulting from the removal and demolition.

For all other properties listed in Table 4-11 as potentially being indirectly affected by the BRCE Project, consultation with the heritage staff at the respective municipality will be undertaken to review the detailed design for BRCE Project works within the Metrolinx owned ROW, once available, to determine if a heritage permit is required. The CHERs and/or HIAs will be completed, as required, subject to the outcome of those consultations. Potential effects on adjacent CHRs due to increased vibration will be assessed during detailed design in accordance with *Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects* (Wilson, Ihrig & Associates Inc., et. al., 2012).

Table 4-11: Summary of Potential Cultural Heritage Impacts and Mitigation Measures for Affected Properties Associated with GO Station Improvements

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Impact	Mitigation
City of Vaughan							
VA-05	18.10-18.30	Maple Village HCD	N/A	Designated, Part V OHA (By-law 167-2007)	N/A	Indirect Effect. Maple GO Station is part of the Maple Village HCD. Effects on the GO Station are noted below and include Potential visual effects associated with the new platform shelters, stair enclosures and tunnels and other above-ground structures and equipment.	HIA for the GO Station will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated.
VA-06	18.28	Maple GO Station	30 Station Street	Part of the Maple Village HCD; Listed on the City of Vaughan Heritage Inventory	This property contains an original 1903 train station built by the Grand Trunk Railway (GTR). The building exhibits Queen Anne architectural influences, large gabled dormers and is clad in stick style or half-timber exterior.	Indirect Effect. Potential visual effects associated with the new platform shelters, stair enclosures and tunnels and other above-ground structures and equipment. Building is located within zone of potential vibration effects (Refer to the Noise and Vibration Impact Assessment provided in Appendix H of this EPR).	HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Vibration mitigation to be confirmed during detailed design, in accordance with the Noise and Vibration Impact Assessment provided in Appendix H of this EPR and *Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects* (Wilson, Ihrig & Associates Inc., et. al., 2012).
Town of Aurora							
AU-04	29.90	Aurora GO Station	121/135 Wellington Street East	PHPPS; National Historic Site; Listed on the Town of Aurora's Heritage Inventory	This property contains an original 1900 GTR standard design station, a bus loop, passenger shelters and a parking lot that extends parallel along the rail line south from Wellington Street.	Indirect Effect. HIA completed with the following impacts identified: • Visual effects associated with platform shelters, stair enclosures and tunnels, electrical/mechanical bunker, expanded lighting, public address, closed circuit television and fare systems. • Additional details can be found in Table 4-3.	HIA recommended the following mitigation: • Place noted features away from sightlines to the station building as much as possible while respecting the building's functional link to the railway tracks. • Designs should adhere to the *Metrolinx Design Excellence Guidelines* and the guidelines specific to Aurora GO Station. • Additional details can be found in Table 4-3.

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Impact	Mitigation
Town of Newmarket							
NE-07	34.35	Newmarket GO Station/ Tannery Mall	465 Davis Drive	Listed, Town of Newmarket's Heritage Register	This property features a large c. 1912 tannery building, since repurposed into a mall and GO Station and a large parking lot stretching from Davis Drive north to where the rail tracks and canal almost converge.	Indirect Effect. Potential visual effects associated with the new platform shelters, stair enclosures and tunnels and other above-ground structures and equipment. Building is located within zone of potential vibration effects (Refer to the Noise and Vibration Impact Assessment provided in Appendix H of this EPR). Trees will be removed in order to accommodate the station upgrades (Refer to the Tree Inventory Plan and Arborist Report in Appendix B of this EPR).	HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER projects.
NE-13	34.44	Residence - 7	91 Franklin Street	PHP (MHC Decision Form June 23, 2017)	The property features a one-and-a half storey frame residence with side gable roof with central gable and a rear one-and-a-half storey addition. The scale and massing of the vernacular cottage suggests an early to mid-twentieth-century construction date. The property retains historical and contextual associations with early-mid twentieth-century development of the Town of Newmarket and the adjacent railway line.	Direct Effect. Major encroachment along property line and potential impacts to the structure and trees due to the GO Station improvements.	HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated.
Town of Bradford West Gwillimbury							
BR-02	41.60	Bradford GO Station	31 Dissette Street	PHP (MHC Decision Form August 14, 2014)	The property features a single GO Station built c. 1900 as a freight and commuter rail facility, a bus transit loop with passenger shelters and a parking lot stretching from the rail line southwest to Bridge Street.	Direct Effect. There are plans to build an addition on to the existing heritage station. The proposed station expansion will result in an alteration to the existing heritage building. Trees will be removed in order to accommodate the station upgrades (Refer to the Tree Inventory Plan and Arborist Report in Appendix B of this EPR).	HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER projects.

CHR #	Mile	Name	Municipal Address	Existing Heritage Recognition	Heritage Value/Description of Resource	Potential Impact	Mitigation
City of Barrie							
BA-04	63.00	Former Allandale Train Station	285 Bradford Street	Heritage Easement	This property contains an original 1904-5 GTR station. The original station is no longer immediately adjacent to the corridor as the former tracks have been removed.	Indirect Effect. Minimal encroachment along property line associated with the future Allandale Waterfront GO Station upgrades. Building is located within zone of potential vibration effects (Refer to the Noise and Vibration Impact Assessment provided in Appendix H of this EPR).	Consultation with heritage staff at the respective municipality should be undertaken to review the detailed design for the BRCE works to determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are not identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, an HIA will be completed during detailed design or prior to Project construction to ensure that impacts of heritage resources are appropriately mitigated. Vibration mitigation to be confirmed during detailed design, in accordance with the Noise and Vibration Impact Assessment provided in Appendix H of this EPR and *Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects* (Wilson, Ihrig & Associates Inc., et. al., 2012).

Table 4-12: Impact Assessment and Mitigation Recommendations for the Aurora GO Station

Proposed Activity	Values and/or Attributes Affected	Adjacent Values and/or Attributes Affected	Potential Impacts on Values and/or Attributes	Severity of Impacts	Mitigation/Alternatives	Mitigated Impact
Existing side platform east of existing track to be rehabilitated	None	None	The activity has no negative impact. If it has not been addressed in advance, repaving the platform provides the opportunity to undertake the repair of the deteriorating wood base of the station building.	None	If it hasn't been addressed in advance, repaving the platform provides the opportunity to undertake the repair of the deteriorating wood base of the station building.	N/A
Construction of a new west island platform	None	None	The introduction of a new platform maintains the functional and visual relationship between the station and the railway. It has no negative impact.	None	N/A	N/A
Snowmelt system for new platform and existing platform	None	None	The snowmelt system consists of below-grade piping and a boiler structure which will be located at a substantial distance from the station building. It has no negative impact.	None	N/A	N/A
New and replacement platform shelters	• The station is the key resource that defines the railway character of the area • The visibility and legibility of its heritage attributes when viewed from passing trains and from Wellington Street East	None	The design and placement of the two new platform shelters nearest to the station building may impact legibility of the station building.	Low	New platform shelters should be placed away from sightlines to the station building as much as possible while respecting the building's functional link to the railway. Their design should adhere to the Metrolinx Design Excellence Guidelines and the guidelines specific to Aurora GO Station.	None
Stair enclosures, elevators and partial platform canopies at two tunnels located at existing bus loop and to north of existing station building	• The station is the key resource that defines the railway character of the area • The visibility and legibility of its heritage attributes when viewed from passing trains and from Wellington Street East	All physical values and attributes	The design and placement of the stair enclosures, elevators and partial platform canopies serving the north tunnel will impact sightlines to and legibility of the station building. The proximity of the northeast stair enclosure to the station building may cause its construction to impact the building's physical integrity through excavation and heavy machinery operations.	Medium	New stair enclosures, elevators and partial platform canopies at the north tunnel should be placed away from sightlines to the station building as much as possible while respecting the building's functional link to the railway tracks. Their design should adhere to the Metrolinx Design Excellence Guidelines and the guidelines specific to Aurora GO Station. The location of the northeast stair enclosure must consider potential impacts to the footing of the station building portico and the foundation of the building, including its angle	Low

Proposed Activity	Values and/or Attributes Affected	Adjacent Values and/or Attributes Affected	Potential Impacts on Values and/or Attributes	Severity of Impacts	Mitigation/Alternatives	Mitigated Impact
					of repose, through geotechnical study. The caisson wall indicated as a solution to protect the railway bed could be extended to isolate and protect the station building. A comprehensive protection plan should be established for the station building to mitigate any impact from construction, such as incidental contact from machine operations which could damage the structure or the finishes. It should include a protective zone around the building.	
Above grade electrical, communications and mechanical bunker located to south of existing bus loop	None	None	This structure is located near the southern extremity of the property at a substantial distance from the station building. It has no negative impact.	None	N/A	N/A
Expanded lighting, public address, closed circuit television and fare systems	None	• The station is the key resource that defines the railway character of the area	These installations will not be fastened to the station building, but their design and placement may impact the legibility of the station building.	Low	New and replacement lighting, public address, closed-circuit television and fare systems should be placed away from sightlines to the station building as much as possible while respecting the building's functional link to the railway. Their design should adhere to the Metrolinx Design Excellence Guidelines and the guidelines specific to Aurora GO Station.	None

Operations and Maintenance

No mitigation measures are required during the operations and maintenance phase.

4.4.4.3 Net Effects

Construction

Construction activities for the GO Station improvements could result in loss or alteration of property and structures for affected CHRs. Impacts to CHRs at these affected properties will be appropriately mitigated or avoided as much as possible through implementation of the recommendations outlined in any municipal approval and/or HIAs/Strategic Conservation Plans, as confirmed prior to Project construction. The mitigation recommended for the Aurora GO Station will reduce potential effects to low or none.

Operations and Maintenance

No net effects to CHRs are anticipated during the operations and maintenance phase of the BRCE Project.

4.4.4.4 Monitoring Activities

Construction

Monitoring activities will be implemented in accordance with any municipal approval and/or HIAs/Strategic Conservation Plans, as confirmed prior to Project construction. To date, no specific monitoring activities were recommended as a result of the HIA for the Aurora GO Station.

Operations and Maintenance

No monitoring activities are required during the operations and maintenance phase.

4.4.5 Socio-Economic and Land Use Characteristics

4.4.5.1 Potential Effects

Pre-Construction Land Clearing/Property Acquisition

As noted Socio-Economic and Land Use Characteristics Report provided in Appendix F of this EPR, each of the GO Stations will be expanded to accommodate the new platforms, tunnels and associated structures. Land acquisition will be minimal and will collectively total approximately 2.80 ha (all GO Stations combined). The land acquisition requirements at each GO Station are summarized in Table 4-13.

Table 4-13: Summary of Land Uses to be Acquired as a Result of GO Station Improvements

Land Use	Land to be Acquired in Phase One (ha)	Land to be Acquired in Future Phase(s) (ha)
City of Vaughan		
Rutherford GO Station		
Road ROW/Easement	0.08	Not applicable
Open Space/Recreational Facility	0.31	Not applicable
Maple GO Station		
Road ROW/Easement	0.34	Not applicable
Township of King		
King City GO Station (no property required)		
Town of Aurora		
Aurora GO Station		
Commercial	0.56	Not applicable
Vacant Land	0.14	Not applicable
Town of Newmarket		
Newmarket GO Station		
Commercial	Not applicable	0.03
Residential	Not applicable	0.45
Town of East Gwillimbury		
East Gwillimbury GO Station		
Open Space/Recreational Facility	Not applicable	0.43
Town of Bradford West Gwillimbury		
Bradford GO Station		
Agricultural	Not applicable	0.02
City of Barrie		
Barrie South GO Station		
Open Space/Recreational Facility	Not applicable	0.44
Allandale Waterfront GO Station (no property required)		
TOTAL	**1.43**	**1.37**

Details regarding the anticipated effects associated with property acquisition at each GO Station where improvements are proposed include:

- Rutherford GO Station: Acquisition limited to property edges as part of Phase One. No significant effects;
- Maple GO Station: Effects to existing road ROW only as part of Phase One. No significant effects;
- Aurora GO Station: Full property acquisition of two commercial properties and a vacant property located on Industrial Parkway South, backing onto the station property, as part of Phase One. Both commercial properties support vehicle maintenance, repair and parts businesses. All three properties are located in the Aurora Promenade Secondary Plan Area;
- Newmarket GO Station: Full property acquisition of five residential properties, as well as partial property acquisition of eight additional residential properties, and one commercial property. All properties are located in the Newmarket Urban Centres Secondary Plan Area. All property acquisitions are part of Future Phase(s) of the BRCE Project;
- East Gwillimbury GO Station: No significant effects as lands are currently undeveloped. A small amount of land will be required adjacent to the Nokiidaa Bike Trail; however, the trail itself will not be affected. All

property acquisitions are part of Future Phase(s) of the BRCE Project. Land acquisition is not expected to significantly affect future development of the area;

- Bradford GO Station: No significant effects as only a small portion of agricultural lands is required as part of Future Phase(s) of the BRCE Project. No agricultural lands within the Specialty Crop Area of the Greenbelt Plan will be affected;
- Barrie South GO Station: No significant effects as surrounding lands are currently undeveloped. Property acquisition is part of Future Phase(s) of the BRCE Project; and
- Allandale Waterfront GO Station: No significant effects as the footprint of the station improvements will be located on existing Metrolinx-owned property and portions of the existing parking areas.

The potential effects to individual property owners due to implementation of the GO Station improvements include the following:

All Land Uses: Tree removal may pose undesirable aesthetic effects to the local residents, businesses, institutions and may affect the overall recreational experience of existing and future park users.

Residential and Commercial Land Uses: Five residential and two commercial properties will be affected by a full buyout. Partial acquisition of a further nine residential properties including the loss of a structure, will occur due to the implementation of the GO Station improvements. Other potential effects include:

- Altered property value;
- Reduced buffer between the GO Station and the primary residential or commercial structure;
- Decreased future development potential;
- Loss of secondary structures and amenity areas such as sheds, garages, patios, gardens, parking areas or fences on residential and other property types;
- Inconvenience associated with the need to relocate; and
- Inconvenience associated with the need to rebuild lost structures.

Agricultural Lands: An estimated 0.02 ha of agricultural lands will be acquired for the Bradford GO Station. This area is considered very minor relative to the property size and is expected to result in a minimal or negligible reduction in productivity, yields and income for farm owners. There will be no loss to any lands within the Specialty Crop Area associated with the Holland Marsh. Acquisition does have the potential to disrupt farm infrastructure, including existing livestock fencing, tile drainage and irrigation systems. The presence of this infrastructure will be confirmed prior to construction and the extent of effects determined.

Open Space and Recreational Lands: Acquisition of 1.19 ha of park lands and other open spaces will be required. No physical structures or trails will be affected.

Future Growth Areas: An estimated 0.46 ha within the Newmarket Urban Centres Secondary Plan Area, and 0.70 ha within the Aurora Promenade Secondary Plan Area will be acquired. As property acquisitions are not likely to significantly affect future growth targets or development potential, the potential effects are expected to be minimal.

Construction

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 stations. Nearby residents, businesses, institutions may experience nuisance effects resulting from increased noise and vibration levels due to construction equipment and activities. Enjoyment of public and private recreational uses within the study area may be affected by increased noise levels due to construction equipment and activities.

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 rail ROW and newly acquired lands will need to be removed. This will result in the loss of a visual buffer that previously screened views of the ROW. This will primarily affect residential properties as well as other visually-sensitive land uses such as parks, places of worship and cemeteries where quiet reflection and contemplation occur. 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 corridor.

Temporary use of adjacent lands may be required for construction purposes (e.g., access, establishment of equipment storage/staging/laydown areas, stockpiling of materials, etc.) through the use of construction easements or TLIs.

Transit Riders: There may be a temporary inconvenience to transit riders. The construction of the GO Station improvements may have a temporary effect on station parking and access.

Vehicle, Pedestrian, Cyclist and Agricultural Traffic: Construction may result in the need for temporary road or lane closures causing access restrictions to nearby residences, parks, businesses, institutions, farm lands and operations, local transit routes and the GO Stations themselves.

Operations and Maintenance

All Land Uses: Nuisance effects from increased noise, vibration, and dust (including diminished air quality conditions) may be experienced on lands in close proximity to the stations from an increased number of passing trains;

Property values tend to increase for properties located in close proximity to a GO Station as transit service increases. Effects are expected to be positive and no mitigation is required;

Recreational Land Uses: The Town of East Gwillimbury and City of Barrie have identified specific needs to improve trail access to the East Gwillimbury GO Station and Barrie South GO Station, respectively. Other municipalities have also identified a need to promote access by non-auto modes and increase trail access.

4.4.5.2 *Mitigation Measures*

Pre-Construction Land Clearing/Property Acquisition

All Land Uses: Metrolinx will coordinate tree removal compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects, as documented in the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR. Where appropriate, Metrolinx will seek to develop an

aesthetically pleasing design for public-facing infrastructure in consultation with municipalities/adjacent landowners.

Residential and Commercial Land Uses: Metrolinx will confirm specific property requirements prior to construction to determine property impacts. Metrolinx will engage and negotiate with affected property owners regarding land acquisition and easements required for the proposed works, and provide fair market value compensation to affected property owners in accordance with applicable laws.

Agricultural Lands: Metrolinx will confirm specific property requirements prior to construction to determine property impacts. Metrolinx will engage and negotiate with affected property owners regarding land acquisition and easements required for the proposed works and to identify any potential impacts to farm infrastructure such as livestock fencing, irrigation systems and tile drainage; and provide fair market value compensation to affected property owners in accordance with applicable laws. Mitigation measures will be developed in consultation with individual owners.

Recreational and Open Space Lands (Parks and Trails): Property acquisition required for the BRCE Project will be undertaken by Metrolinx, with the objective being to provide fair market value compensation to affected property owners in accordance with applicable laws. Metrolinx will engage with park owners/operators to confirm predicted effects. Mitigation measures will be developed in consultation with individual owners, as required.

Future Growth Areas: Metrolinx have consulted municipalities as part of the BRCE Project and will continue to consult with municipalities. Property requirements will be confirmed prior to construction to determine property impacts. Metrolinx will engage and negotiate with affected property owners regarding land acquisition and easements required for the proposed works and to identify any potential impacts to farm infrastructure such as livestock fencing, irrigation systems and tile drainage; and provide fair market value compensation to affected property owners in accordance with applicable laws.

Construction

All Land Uses: Construction-related noise, vibration, and dust effects (including diminished air quality conditions) will be managed to ensure 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. Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction. 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.

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.

Metrolinx will coordinate tree removal compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects, as documented in the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR. Where appropriate, Metrolinx will seek to develop an aesthetically pleasing design for public-facing infrastructure in consultation with municipalities/adjacent landowners.

A review will be completed prior to the construction phase to identify temporary easements for construction or other purposes to accommodate the BRCE Project work. Construction will be planned to limit the need for construction easements to the extent possible. Construction laydown areas and easements will be selected to minimize effects to the extent possible (e.g., vacant lands and industrial lands will be used as much as possible). Metrolinx will engage with affected land owners regarding easements required for the proposed works.

Transit Riders: Metrolinx intends to keep GO Stations operational during the construction period to the extent practical. If the need for a closure arises, GO Buses will be available to take transit users to the next available station. Construction equipment and stockpiles will be staged to limit disruption to transit service and access to the extent possible. The intent is to maintain as much of the existing GO Station parking lot facilities as possible by utilizing other off-site and non-parking areas for construction related activities wherever feasible.

Vehicle, Pedestrian, Cyclist and Agricultural Traffic: Adequate construction hauling routes will be determined in consultation with municipalities. Site-specific Traffic Control and Management Plans will be prepared and implemented prior to construction and prior to 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. Additional details are presented in the TIA provided in Appendix I of this EPR.

Operations and Maintenance

All Land Uses: Operations will be carried out in accordance with applicable regulations and standards, including Ontario's AAQC (PIBS#6570e01) (MOE, 2012), MOECC/GO Draft Protocol (MOEE, 1994) and the Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning Publication NPC-300 (MOE, 2013). Mitigation measures related to noise, vibration and air quality will be implemented as described in the Air Quality Study and the Noise and Vibration Impact Assessment, provided in Appendices G and H, respectively. The future use of electric trains on this 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.

Recreational Land Uses: Metrolinx, in consultation with the Town of East Gwillimbury, will investigate the possibility of a trail access to the East Gwillimbury GO Station from the adjacent Nokiidaa Bike Trail prior to construction. Metrolinx will also work with the City of Barrie throughout the detailed design and prior to construction to investigate the possibility of a trail connecting the Barrie South GO Station to the new developments located to the east of the corridor. Metrolinx will also work with other municipalities prior to construction and beyond to improve trail access to all stations, where feasible.

4.4.5.3 Net Effects

Pre-Construction Land Clearing/Property Acquisition

All Land Uses: The effects to properties will be mitigated by providing fair market value compensation in accordance with applicable laws and through negotiations with affected property owners. Thus, net effects are expected to be minimal.

Residential and Commercial Land Uses: No net effects are anticipated. The effects to properties will be mitigated by providing fair market value compensation in accordance with applicable laws.

Agricultural Lands: No net effects are expected. The effects to agricultural lands will be mitigated by providing fair market value compensation in accordance with applicable laws.

Recreational and Open Space Lands: No net effects are likely.

Future Growth Areas: No net effects are foreseeable.

Construction

All Land Uses: The temporary effects to transit riders during construction will be minimized to the extent practical. Thus, no net effects are likely.

Any temporary visual effects will be minimized to the extent practical. Thus, no net effects are expected.

Metrolinx will coordinate tree removal compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects, as documented in the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR. Where on-site compensation cannot be accomplished within the Landscape Plans, Metrolinx will work with the conservation authorities and municipal agencies to explore off-site compensation. The compensation protocol to be determined between Metrolinx, conservation authorities, and municipalities will be applied to offset the loss of tree canopy.

The temporary encroachment effects will be minimized to the extent practical. Thus, no net effects are anticipated.

Transit Riders: The temporary effects to transit riders during construction will be minimized to the extent practical. Thus, no net effects are expected.

Vehicle, Pedestrian, Cyclist and Agricultural Traffic: The temporary restrictions to access points will be minimized to the extent practical. Thus, no net effects are projected.

Operations and Maintenance

All Land Uses: The nuisance effects during operations will be mitigated through compliance with regulatory requirements and identified noise, vibration and air quality mitigation. Thus, no net effects are projected.

Potential for an increase in property values for properties located in close proximity to a GO Station due to an increase in transit service. Thus, net effects are projected to be positive.

Recreational Land Uses: Trail connections and improvements will provide enhanced non-vehicle access to the transit system and will therefore reduce road traffic. Thus, net effects are projected to be positive.

4.4.5.4 *Monitoring Activities*

Pre-Construction Land Clearing/Property Acquisition

All Land Uses: No monitoring activities are required.

Residential and Commercial Land Uses: No monitoring activities are required.

Agricultural Lands: No monitoring activities are required.

Recreational and Open Space Lands (Parks and Trails): No monitoring activities are required.

Future Growth Areas: No monitoring activities are required.

Construction

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 zones.

Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with 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.

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.

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.

Transit Riders*:* Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with plans and within specified construction zones.

Vehicle, Pedestrian, Cyclist and Agricultural 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.

Operations and Maintenance

All Land Uses: Metrolinx have 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, municipalities and/or the public.

Recreational Land Uses: Metrolinx have ongoing inspection schedules to monitor the effectiveness of its GO Transit operations; and, a complaints procedure is in place to address any concerns raised by neighbouring land owners, municipalities and/or the public.

4.4.6 *Air Quality*

4.4.6.1 *Potential Effects*

Construction

The proposed GO Station improvements generally consist of modifications to existing structures, platforms, walkways, parking, and landscaped areas. Therefore, air emissions associated with the construction of the GO Station improvements will typically include:

- Fugitive dust emissions resulting from:
  - The necessary soil excavation and filling activities required to facilitate the modified site layout for station improvements;
  - The demolition of structures necessary to accommodate station improvements;

- Cutting of existing concrete;
- The stockpiling of soil and other friable construction materials; and
- The transport of friable fill materials via dump trucks.

In addition, emissions generated from the combustion engines of construction equipment will also occur during construction.

Operations and Maintenance

During operations and maintenance of the improved GO Stations, the major source of air emissions is generated by the combustion engines of passenger vehicles in the parking lots. Fugitive dust emissions may also be generated from vehicles travelling on the parking lot and adjacent driveways.

4.4.6.2 *Mitigation Measures*

Construction

The Contractor will be required to implement the same BMPs as outlined for the construction of rail infrastructure. To mitigate anticipated fugitive dust emissions from existing concrete cutting at the GO Station improvements, concrete saws with water control will be used wherever possible.

Operations and Maintenance

Operations and maintenance of the improved GO Stations will be carried out in accordance with applicable regulations and standards, including Ontario's AAQC (PIBS#6570e01) (MOE, 2012).

Erecting signs that encourage people to turn their vehicles off rather than idling for long periods of time could reduce the generation of air contaminants during the operations and maintenance phase of the improved stations. Improved walkways and trail connections could also potentially reduce the amount of cars and corresponding emissions in parking lots by encouraging walking and cycling instead of driving to the stations.

Dust emissions from the site will be minimized by cleaning the roadways and parking lots from time to time.

4.4.6.3 *Net Effects*

Construction

The potential air quality effects associated with the construction phase of GO Station improvements are expected to be temporary and localized to the areas adjacent the stations. Effects will be reduced to the extent possible through implementation of construction BMPs.

Operations and Maintenance

Air emissions from vehicles in parking lots and adjacent driveways will be minimized to the extent possible through improved access for pedestrians and cyclists, signs targeted at reducing idling, and periodic cleaning of driving surfaces.

4.4.6.4 *Monitoring Activities*

Construction

It is recommended that construction of the GO Station improvements follow the same monitoring and response protocols as outlined for rail infrastructure construction.

Operations and Maintenance

Metrolinx has ongoing inspection schedules to monitor the effectiveness of its GO operations. A complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.

4.4.7 *Noise*

4.4.7.1 *Potential Effects*

Construction

Construction activities associated with the GO Station Improvements likely to cause potential noise effects generally include:

- Demolition of existing structures;
- Breaking of asphalt and concrete through the use of hydraulic hammers or jack hammers; and
- Soil excavation, grading, compaction, and pile driving.

The above potential effects are generally limited to the lands adjacent to the GO Station improvements, and may be perceived as a short term nuisance to affected building occupants.

Operations and Maintenance

Based on all inputs and criteria outlined in Section 3.1.10, noise modelling was conducted to evaluate the following:

- The Adjusted Noise Impact between the existing conditions and Future, Scenario 1; and
- The Adjusted Noise Impact between the existing conditions and Future, Scenario 2.

The results of the Noise and Vibration Impact Assessment provided in Appendix H of this EPR indicate that the Adjusted Noise Impacts at the sensitive receptors near GO Stations exceed the 5 dB criteria due to increased train traffic at the following GO Stations:

- Future, Scenario 1: future GO Station at Caledonia and existing stations at Rutherford, Maple, King City, Aurora, and Newmarket.
- Future, Scenario 2: future GO Station at Caledonia and existing stations at Rutherford, Maple, King City, Aurora, and Newmarket.

4.4.7.2 Mitigation Measures

Construction

Applicable construction BMPs will be employed to minimize any adverse effects from construction noise at nearby sensitive receptors. This includes, but is not limited to, the mitigation measures described in Section 4.3.7.2 for the construction of the new rail infrastructure.

Operations and Maintenance

Applicable mitigation measures were assessed for the sensitive receptors identified in Future Scenarios 1 and 2, respectively, that were modelled to have significant or very significant Adjusted Noise Impacts near the GO Stations. The model assessed eight and nine noise barriers, for Future Scenarios 1 and 2 respectively, and found that five noise barriers were technically feasible for Future Scenarios 1 and 2 for the following GO Stations:

- Future Caledonia, and existing Rutherford, Maple, and King City GO Stations for Future Scenarios 1 and 2 and Newmarket GO Station for Future, Scenario 2 only.

4.4.7.3 Net Effects

Construction

Construction related impacts will be minimized through implementation of BMPs. No net effects, including damage to neighbouring property or infrastructure, are anticipated.

Operations and Maintenance

Noise impacts from operations do not affect the York University, future Downsview Park, East Gwillimbury, Bradford, Barrie South and Allandale Waterfront GO Stations. Noise impacts at the future Caledonia, existing Rutherford, Maple, King City, and Newmarket GO stations will be mitigated through the application of technically feasible noise barriers identified for Future, Scenario 1 and 2, respectively in the Noise and Vibration Impact Assessment, provided in Appendix H of this EPR. Noise mitigation at the Aurora GO Station requires measures that may not be technically or economically feasible. An assessment to address this net effect will be conducted as part of the detailed design.

4.4.7.4 Monitoring Activities

Construction

Construction activities will be monitored by a qualified Environmental Inspector who will check the effectiveness of the mitigation measures and construction BMPs to confirm they are being employed to minimize any adverse effects from construction noise at nearby sensitive receptors. This includes, but is not limited to, the monitoring measures described in Section 4.3.7.4**Error! Reference source not found.** for the construction of the new rail infrastructure.

Operations and Maintenance

Metrolinx and GO Transit have ongoing inspection schedules to monitor the effectiveness of their operations. A complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.

4.4.8 Vibration

4.4.8.1 Potential Effects

Construction

Construction activities associated with the GO Station improvements likely to cause potential vibration effects generally include:

- Demolition of existing structures;
- Breaking of asphalt and concrete through the use of hydraulic hammers or jack hammers; and
- Soil excavation, grading, compaction, and pile driving.

The above potential effects are generally limited to the lands adjacent to the GO Station improvements, and may be perceived as a short term nuisance to affected building occupants.

Operations and Maintenance

For locations where the proposed second track will be closer to the sensitive area, it was determined that the vibration levels at the sensitive receptors were either less than the MOECC/GO Draft Protocol desirable objective level of 0.14 mm/s, or less than 25% above the objective level. As such, the potential vibration impacts are within acceptable ranges and further evaluation of mitigation measures is not required as shown in Table 4-14.

Metrolinx has determined that vibration at 75 metres will not exceed the 0.14 mm/s criterion (Section 7 of Metrolinx-GO Transit Adjacent Development Guidelines (2013)). There are no sensitive receptors within 75 metres of the York University, East Gwillimbury or Bradford GO Stations therefore these GO Stations are not featured in Table 4-14. If the proposed second track is located beyond the existing track then the setback from the receptor will not change and therefore the vibration velocity at this receptor is not expected to increase and has not been included in this table. Full details for these measurements are provided in the Noise and Vibration Impact Assessment contained in Appendix H of this EPR.

Table 4-14: Sensitive Receptor Measurements and Mitigation Considered for GO Stations

GO Station	Mileage	Closest Representative Sensitive Receptor	Distance (Foundation to existing Track) (m)	Distance to New Track (m)	Measured RMS Pass (mm/s) [1, 2]	Does Measured Value Exceed Desired Objective Level?	Predicted Increase by Logarithmic Regression (%)	Mitigation Investigation Required?
Caledonia	6.52	SR012	37	33	0.43	Yes	13%	No
Rutherford	16.70	SR022	38	34	0.20	Yes	10%	No
Maple	18.30	SR026	40	36	0.35	Yes	5%	No
Aurora	29.90	SR043	64	60	0.35	Yes	0%	No
		SR045	47	43	0.36	Yes	0%	No
		SR046	39	35	0.24	Yes	8%	No
Newmarket	34.20	SR052	42	38	0.12	No		No

[1] If the "Measured RMS Pass (mm/s)" shows "0.00", indicates that a valid measurement was obtained at that location and no vibration above 0.127 mm/s was recorded for that location.

[2] If the "Measured RMS Pass (mm/s)" shows "-", no measurement is available for that location. For SA081 to SA101 field measurements were not undertaken as it was considered that sufficient monitoring had been undertaken to characterize the Barrie rail corridor vibration levels. For other sensitive areas where no measurement is available this is due to the background vibration levels being so high that it was not possible to identify the train pass-bys.

The recently completed EPR for the Caledonia GO Station (2016) indicated that the vibration at sensitive receptors near the Caledonia GO Station would experience less vibration with the trains stopping at the station than when the trains passed by without stopping. Therefore, vibration during the operations and maintenance phase is not expected to have any adverse effect near the Barrie rail corridor's existing GO Stations.

4.4.8.2 *Mitigation Measures*

Construction

Construction BMPs will be employed to minimize any adverse effects from construction vibration at nearby sensitive receptors. This includes, but is not limited to the mitigation measures described above for the construction of the new rail infrastructure.

Operations and Maintenance

No mitigation measures are required during the operations and maintenance phase.

4.4.8.3 *Net Effects*

Construction

Construction related impacts will be minimized through implementation of BMPs. No net effects, including damage to neighbouring property or infrastructure, are anticipated.

Operations and Maintenance

No impacts or mitigation measures are required due to operations and maintenance activities. Thus, there are no net effects associated with operations and maintenance of the GO Stations.

4.4.8.4 *Monitoring Activities*

Construction

Construction activities will be monitored by a qualified Environmental Inspector who will check the effectiveness of the mitigation measures and construction BMPs to confirm they are being employed to minimize any adverse effects from construction vibration at nearby sensitive receptors. In the event that mitigation is found to not be effective, the Contractor will be notified to implement revised mitigation measures designed to improve effectiveness.

Should the Contractor or Environmental Inspector notice or be made aware of property or infrastructure damage due to construction vibration, the Contractor will immediately stop work in the area. At this time, the Contractor will develop a restoration plan in consultation with the property or infrastructure owner, and will complete the work using alternative methods to prevent further damage.

The Contractor will prepare and implement a complaints protocol for receiving, investigating and addressing construction vibration complaints received from the public. The protocol will include a plan for how the public is to be notified of their options for lodging a complaint.

The Contractor will install monitoring equipment, as required, to measure and document vibration levels at various points to provide empirical data for the assessment of complaints.

Operations and Maintenance

No ongoing monitoring is required during the operations and maintenance phase.

4.4.9 *Traffic and Transportation Infrastructure*

4.4.9.1 *Potential Effects*

Construction

The primary construction effects of the BRCE Project on existing GO Stations along the corridor relate to the need to obtain construction access to complete the proposed improvements at the various stations. These effects will vary depending on the location of the improvements relative to the existing station infrastructure (accesses and parking), the extent of improvements required, and the opportunities/constraints imposed by the adjacent land use and adjacent road network. These factors are discussed further below and will be considered further as part of the detailed design for these works.

The construction of the GO Station improvements will have a temporary effect on the existing accesses, potentially the adjacent road networks and parking at the stations where it is expected that construction access and construction staging may need to use this existing infrastructure. Stations that are expected to experience such effects include:

- King City GO Station - Construction access is assumed through the existing parking area on the west side of the tracks; approximately 30 existing parking spaces will be permanently removed to facilitate construction;
- Aurora GO Station - Construction access is assumed through the parking area on the west side of the tracks; between 150 and 160 parking spaces will be permanently removed to facilitate construction;
- Newmarket GO Station - Construction access is assumed through the parking area on the east side of the tracks. This access will require a crossing of the railway. It is assumed that access from the local residential streets to the west will not be permitted;
- Bradford GO Station - Construction access is assumed through the main parking area; some parking will be removed to facilitate construction;
- Barrie South GO Station - Construction access is assumed through the station access, which will require crossing of the tracks in this area; and
- Allandale Waterfront GO Station - Construction access is assumed from the parking area along Gowan Street.

Where the station improvements are located on the opposite side of the tracks to the existing station infrastructure it is preferred that construction access be provided from that side, to minimize disruption to the existing station operations and the need to cross the existing rail line. However, in some cases, site restrictions preclude access from the preferred side. For the purposes of this EPR it is assumed that acceptable construction access can be obtained from this preferred side, where possible, or otherwise this access will be provided adjacent to the existing station infrastructure. The construction access to these stations is described as follows:

- Rutherford GO Station - Construction access is assumed from Rutherford Road, which crosses a trail/sidewalk in this area. It is assumed that access from the local residential streets to the east will not be permitted;
- Maple GO Station - Construction access is assumed from Hill Street, which will require a crossing of the tracks in this area. It is assumed that access from the local residential streets to the west will not be permitted; and
- East Gwillimbury GO Station - Construction access is assumed from Green Lane East, which crosses the trail network in this area and will have a temporary effect on the active transportation (pedestrian/cyclist) network.

Operations and Maintenance

The forecasted increases in ridership on the Barrie rail corridor will have an effect on the transportation accesses to the station (e.g., road, transit, active transportation), as well as on the traffic operations on the road network in the area of the stations. The extent of these effects will depend on the magnitude of the ridership increases and the opportunities/constraints imposed by the adjacent road network and access linkages, described as follows:

- Rutherford GO Station
  - The intersection of Rutherford Road/Westburne Drive/Barrhill Road is forecasted to have congested traffic operations under 2021 conditions;
  - The intersection of Rutherford Road/GO Station Access is forecasted to have congested traffic operations under 2025 conditions;
  - Potential need for improved transit connections to continue to provide acceptable access to the GO Station with the increased GO ridership; and
  - Potential need for improvements to active transportation linkages to the station.
  - Maple GO Station
  - The intersections of McNaughton Road/Troon Avenue/Rodinea Road and Major Mackenzie Drive/Peter Rupert Avenue/McNaughton Road are forecasted to have congested traffic operations under 2021 conditions;
  - The intersection of Major Mackenzie Drive West/Hill Street is forecasted to have congested traffic operations under 2025 conditions;
  - Potential need for improved transit connections to continue to provide acceptable access to the GO Station with the increased GO ridership; and
  - Potential need for improvements to active transportation linkages to the station.
- King City GO Station
  - The intersection of King Road/Keele Street is forecasted to have congested traffic operations under 2025 conditions;
  - Potential need for improved transit connections to continue to provide acceptable access to the GO Station with the increased GO ridership; and
  - Potential need for improvements to active transportation linkages to the station.
- Aurora GO Station
  - The intersections of Wellington Street East/Ross Street, Industrial Parkway South/GO Access South and Wellington Street East/Industrial Parkway are forecasted to have congested traffic operations under 2021 conditions;
  - Potential need for improved transit connections to continue to provide acceptable access to the GO Station with the increased GO ridership; and
  - Potential need for improvements to active transportation linkages to the station.
- Newmarket GO Station
  - Davis Drive has recently undergone a major redevelopment to incorporate the Region's Viva Yellow BRT line along this corridor. This redevelopment has provided a road and transit network that can accommodate the station upgrades proposed in the BRCE Project. However, it is expected that there may still be some need to implement additional direct transit routes to serve some of the residential subdivisions in the area and that a second road access be provided to the GO Station lands, for security of access operations; and

- Potential need for improvements to active transportation linkages to the station.

- East Gwillimbury GO Station
  - The intersection of Green Lane East/Concession Road 2 currently has congested traffic operations;
  - The intersection of Green Lane East/GO Station Access is forecasted to have congested traffic operations under 2025 conditions;
  - Potential need for improved transit connections to continue to provide acceptable access to the GO Station with the increased GO ridership; and
  - Potential need for improvements to active transportation linkages to the station.
- Bradford GO Station
  - The intersection of Bridge Street/Dissette Street currently is approaching congested traffic operations;
  - The intersection of Dissette Street/GO Station Access North is forecasted to have congested traffic operations under 2021 conditions;
  - Potential need for improved transit connections to continue to provide acceptable access to the GO Station with the increased GO ridership; and
  - Potential need for improvements to active transportation linkages to the station.
- Barrie South GO Station
  - The intersection of Yonge Street/Mapleview Drive East is forecasted to have congested traffic operations under 2021 conditions;
  - Potential need for improved transit connections to continue to provide acceptable access to the GO Station with the increased GO ridership; and
  - Potential need for improvements to active transportation linkages to the station.
- Allandale Waterfront GO Station
  - Potential need for improvements to active transportation linkages to the station.

4.4.9.2 *Mitigation Measures*

Construction

Through the detailed design and approvals phase, it is expected that Metrolinx will make the necessary arrangements for construction access and staging, including determining adequate construction hauling routes, the provision of temporary or permanent access easements and off-site parking arrangements for construction workers, etc. Design and construction plans will include site-specific Traffic Control and Management Plans, delineation of staging areas, wayfinding signage, and parking lot adjustments. Where possible, use of local residential streets for construction access purposes, will be restricted.

Where significant parking lot reductions are required to temporarily facilitate construction, Metrolinx will consider use of temporary off-site parking and shuttle buses as an alternate arrangement.

Metrolinx will work collaboratively with York Region to coordinate the construction at the Rutherford GO Station with the planned Rutherford Road grade separation project.

Operations and Maintenance

The mitigation of operations and maintenance effects was considered on a station by station basis, below. For all GO Stations, parking and station access will be assessed as part of the update to the 2013 GO Transit Rail Parking and Station Access Plan.

- Rutherford GO Station
  - An additional northbound left-turn lane may be required at the intersection of Rutherford Road/GO Station Access, if major parking expansions are proposed to use this access; and
  - Consider providing an improved pedestrian connection between Rutherford Road and the GO Station platforms.
- Maple GO Station
  - Consider implementing a bus loop off of Hill Street to better serve the GO Station.
- King City GO Station
  - Provide additional bicycle parking, as necessary, to respond to growth demands.
- Newmarket GO Station
  - Coordinate with the Town of Newmarket regarding their planning for a new local road connection between Main Street North and the GO Station, including a new overpass of the Barrie rail corridor.
- East Gwillimbury GO Station
  - Consider further access connections to the station from the Nokiidaa Bike Trail, Main Street North and the Haines Road residential subdivision.
- Bradford GO Station
  - Consider signalizing the intersection of Dissette Street/GO Station Access and adding a westbound left-turn lane.

4.4.9.3 *Net Effects*

Construction

Generally the construction of the works proposed as part of the BRCE Project will have no net traffic-related effects where construction access will be external to the GO Station lands. However, where access and staging must use existing station accesses and/or remove existing station parking, the temporary net effects will be increased inconvenience where no parking expansions are proposed to offset the parking reductions.

Operations and Maintenance

The net effects during the operations and maintenance phase have been considered on a station by station basis. For all GO Stations, it is expected that with the implementation of the updated 2013 GO Transit Rail Parking and Station Access Plan, the potential effects to parking and station access will be minimized as discussed below.

- Rutherford GO Station
  - No net effects are anticipated to either transit networks or active transportation (pedestrian/cyclist) networks, assuming that the identified external works are implemented by the respective authorities.
- Maple GO Station
  - No net effects are anticipated to either transit networks or active transportation (pedestrian/cyclist) networks, assuming that the identified external works are implemented by the respective authorities.
- King City GO Station
  - No net effects are anticipated to active transportation (pedestrian/cyclist) networks, assuming that the identified external works are implemented by the respective authorities.
- Aurora GO Station
  - No net effects are anticipated to active transportation (pedestrian/cyclist) networks, assuming that the identified external works are implemented by the respective authorities.
- Newmarket GO Station
  - Risk of access disruption will remain high until a second access can be provided to the station lands; and
  - No net effects are anticipated to either transit networks or active transportation (pedestrian/cyclist) networks, assuming that the identified external works are implemented by the respective authorities.
- East Gwillimbury GO Station
  - No net effects are anticipated to either the transit networks that are planned or active transportation (pedestrian/cyclist) networks, assuming that the identified external works are implemented by the respective authorities.
- Bradford GO Station
  - No net effects are anticipated to the active transportation (pedestrian/cyclist) networks, assuming that the identified external works are implemented by the respective authorities; and
  - The Town of Bradford West Gwillimbury may face increasing pressure to improve transit service to respond to potential growth in GO ridership. However, the overall result could be a positive effect by increasing local transit usage and reducing vehicular traffic during Peak Periods.
- Barrie South GO Station
  - No net effects are anticipated to either transit networks or active transportation (pedestrian/cyclist) networks, assuming that the identified external works are implemented by the respective authorities.
- Allandale Waterfront GO Station
  - No net effects are anticipated to either transit networks or active transportation (pedestrian/cyclist) networks.

4.4.9.4 *Monitoring Activities*

Construction

Construction inspection, by Metrolinx and, if necessary, the affected municipalities, will ensure that the approved designs and site-specific Traffic Control and Management Plans are effectively implemented, and the prescribed mitigation measures are working as planned.

Parking effects at the stations will be monitored, as construction occurs, to identify if temporary off-site parking arrangements should be implemented. This monitoring should include the identification of parking requirements to support ongoing station operations, potential spill-over parking into adjacent areas and off-site parking for construction workers.

Metrolinx will monitor pedestrian/cyclist movements at the stations, as construction occurs, to ensure that safe pedestrian/cyclist routes and access are provided through and/or adjacent to construction work areas. Pedestrian routes and access, including temporary pedestrian facilities, will comply with the requirements of the *Accessibility for Ontarians with Disabilities Act* and must be properly signed and lighted. Special facilities, such as handrails, fences and walkways, will be provided for pedestrian safety.

Access during construction will be monitored to minimize potential effects such as increased dust, mud tracking onto roadways, and property damage, to the extent practical. Metrolinx and/or its Contractor will respond to all construction-related complaints in an effective and timely manner.

Operations and Maintenance

Metrolinx will keep informed of matters that may affect GO Station operations (e.g., road network improvements, transit improvements, active transportation improvements) and will continue to liaise and coordinate with potentially affected municipal road and transit authorities on these matters. In high growth areas and where stations may be affected, Metrolinx will review future Traffic Impact Studies and/or transportation plans, prepared by developers or municipalities, to ensure that the forecasted station operations are not adversely affected, and to provide feedback, if necessary, on proposed improvements to the transportation network.

Metrolinx will continue to monitor parking (vehicular and bicycle) at the stations as GO ridership growth occurs, in order to increase the parking supply, as necessary.

4.4.10 *Utilities and Municipal Infrastructure*

4.4.10.1 *Potential Effects*

Construction

An assessment of the utilities and municipal infrastructure at the GO Stations was conducted in conjunction with the assessment for the proposed rail infrastructure works through the station areas. The utilities and municipal infrastructure identified in Section 3.2.13 were identified as potentially being affected by the GO Stations improvement works.

Operations and Maintenance

No effects are anticipated during operations and maintenance.

4.4.10.2 *Mitigation Measures*

Construction

The following mitigation measures for utilities and municipal infrastructure located along or crossing the Barrie rail corridor at the GO Stations has been identified and will be considered further prior to Project construction:

- Rutherford GO Station – Metrolinx signals infrastructure running parallel to the existing tracks will be protected during construction;
- Maple GO Station – The telecom must be protected during construction. The sanitary sewer crossing appears to have low potential for effect from the proposed station improvements, however this will be confirmed prior to construction;
- King City GO Station – Metrolinx electrical infrastructure crossing and parallel to existing tracks will be relocated as part of the station improvements.
- Aurora GO Station – Two storm sewers crossing the location of the proposed tracks and one overhead utility crossing the existing tracks appear to have low potential for effect from the proposed station improvements, however this will be confirmed prior to construction;
- Newmarket GO Station – Metrolinx signals that cross and run parallel to the existing rail ROW must be protected during construction. There is a low potential that the three sanitary sewers and one watermain will be effected by proposed station improvements, however this will be confirmed prior to construction;
- East Gwillimbury GO Station – There is no effect to the Metrolinx signals run parallel to the existing tracks;
- Bradford GO Station – The gas main appears to have a low potential effect from proposed station improvements, however this will be confirmed prior to construction. The telecom crossing the existing tracks will be protected during construction;
- Barrie South GO Station – A storm sewer storm appears to have low or minimal effect from the proposed station improvements. This will be confirmed prior to construction of the station;
- Allandale Waterfront GO Station – The four storm sewers appear to have low or minimal effect from the proposed station improvements. This will be confirmed prior to construction of the station work; the telecom and unknown utility crossings will be protected in place during construction.

Mitigation measures will be further reviewed prior to the construction phase for known utility/infrastructure crossings and utilities/infrastructure running along the corridor in coordination with the utility owner. The following mitigation measures will be considered prior to the construction phase:

- Protect – The utilities/infrastructure are left in place and protected through barriers and other methods while construction occurs around them; or
- Relocation/Remove – Utilities/infrastructure are rerouted around the area of construction in cases where utilities are active or removed in cases where the utility is abandoned.

Operations and Maintenance

No mitigation is required during operations and maintenance.

4.4.10.3 *Net Effects*

Construction

As potential effects to utilities and municipal infrastructure can be effectively mitigated, no net effects are expected.

Operations and Maintenance

No net effects are anticipated.

4.4.10.4 *Monitoring Activities*

Construction

Monitoring of utility/infrastructure relocation and protection will be in accordance with the utility/infrastructure owner's protocols.

Operations and Maintenance

No monitoring is required.

4.5 Proposed Bradford Layover Facility

4.5.1 *Wildlife, Terrestrial Habitat, Aquatic Habitat, and Significant Natural Areas*

4.5.1.1 *Potential Effects*

Pre-Construction Land Clearing/Property Acquisition

Due to construction of the Bradford Layover Facility, a small number of natural features will be removed. All are human-influenced and their ecological significance has not yet been determined. In total 4.60 ha of natural area will be removed. This includes a 0.90 ha square-shaped unevaluated wetland, created through grading during development of the Artesian Industrial Park. An additional 3.70 ha of cultural meadow and thicket will be removed. Natural area removals are summarized in Table 4-15 and detailed in the NER.

Table 4-15: Summary of Natural Area to be Removed to Accommodate the Bradford Layover Facility

Municipality	Natural Feature	Area to be Removed (ha)
Town of Bradford West Gwillimbury	Human-made, unevaluated wetland providing Candidate Habitat for: Blanding's Turtle; Least Bittern; and King Rail.	0.90
	Cultural Meadow and Thicket providing Candidate Habitat for: Eastern Meadowlark; and Shrub/Early Successional Birds.	3.70
TOTAL		4.60

Human-made Wetland, Wildlife Habitat and Species at Risk: Potential effects on the unevaluated wetland, Candidate SWH and Candidate Habitat for Endangered and Threatened Species could include the following:

In the unevaluated wetland: The entire human-made wetland, totaling 0.90 ha will be removed. The wetland is a square-shaped depression created through grading. In general, it does not provide any unique or ecologically important features or functions; however, given its close proximity to the provincially significant Holland Marsh Wetland Complex, it could potentially provide habitat for Blanding's Turtles, King Rail and Least Bittern; and

In the Cultural Meadow and Thicket Areas: A cultural thicket and portions of an adjacent cultural meadow will be removed. These areas were cleared in the past, likely as part of the initial development of the industrial park. They are in a state of early succession and could potentially provide habitat for Shrub/Early Successional Breeding Birds and the provincially Threatened Eastern Meadowlark[31].

Nests of Migratory Birds: Nests could be harmed or destroyed as a result of vegetation clearing. This is in contravention of the MBCA, 1994.

Construction

Provincially Significant Wetland and Fish Habitat: The adjacent PSW could be affected as follows:

- Grading and soil disturbance during construction could lead to erosion and sedimentation to the adjacent provincially significant Holland Marsh Wetland Complex and tributary of the West Holland River. This could affect the quality of habitat, disturb ground vegetation and negatively affect the quality of fish habitat;
- 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 and the health of vegetation and wildlife in the PSW and watercourse; and
- Dewatering required during the construction of any deep foundations or footings or other below-ground (sub-surface) works has the potential to affect groundwater levels, wetland water levels and the hydrology of the watercourse.

Provincially Significant Wetland: The adjacent PSW could be affected as follows:

- Dust created as a result of construction has the potential to settle on adjacent vegetation, disturbing wildlife and their habitat;
- Stockpiled materials, equipment or construction activities could accidentally encroach into natural areas beyond the proposed property limits. This could add to the disturbance to natural features and increase the quantity lost as a result of the BRCE Project. Soils beyond the proposed property limits could also become compacted or disturbed if activities extend beyond approved limits; and
- Any disturbance to lands and vegetation clearing has the potential to allow invasive species to be introduced and spread through natural areas. Invasive species can prevent other native species from re-establishing.

Fish Habitat: A small watercourse runs through the site. It appears to provide direct fish habitat, although the culvert under the rail corridor may present a seasonal barrier to fish migration. This watercourse cannot be maintained in its current location in order to accommodate the train layover facility.

Operations and Maintenance

Provincially Significant Wetland and Fish Habitat: Spills of fuel and other hazardous materials 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.

4.5.1.2 *Mitigation Measures*

Pre-Construction Land Clearing/Property Acquisition

Mitigation measures were developed to address each of the potential effects associated with the Bradford Layover Facility, as follows:

Human-made Wetland, Wildlife Habitat and Species at Risk: Mitigation will include the following:

- A qualified Environmental Inspector[32] is required throughout the construction period to ensure that protection measures are implemented, maintained and enforced;
- Species-specific site investigations will be undertaken as part of the detailed design process. If any Endangered or Threatened Species are found, compensation will be provided as required under the ESA, 2007. Compensation will be developed in conjunction with the MNRF through the permitting and/or registration process. If Endangered or Threatened Species are not found, removal of the wetland will be addressed through the Vegetation Compensation Protocol for Metrolinx RER Projects to be developed in consultation with regulatory agencies;
- If Eastern Meadowlark are found, compensation will be provided as required under the ESA, 2007. Compensation will be developed in conjunction with the MNRF through the permitting and/or registration process; and
- If Eastern Meadowlark is not found but the criteria for Significant Shrub/Early Successional Bird Breeding Habitat is met, the removal of habitat will be addressed through the Vegetation Compensation Protocol for Metrolinx RER Projects to be developed in consultation with regulatory agencies.

Nests of Migratory Birds: Mitigation will be implemented as follows:

- Any vegetation clearing will take place outside of the breeding bird timing window, generally from April 1st to August 31st[33]; and
- 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 Ecologist/Avian Biologist confirms that the birds have fledged and the nest is no longer active.

[31] The area is likely too small to support Bobolink but may be sufficient to support Eastern Meadowlark which can tolerate slightly smaller habitat areas.

[32] 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 erosion and sediment control 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.

[33] This timing window does not apply where habitats have been identified as part of the habitat of a SAR. In that case, timing windows will be confirmed by the MNRF.

If a nesting migratory bird (or SAR protected under ESA, 2007) is identified within or adjacent to the construction site, all activities will stop and the Contractor (with assistance from a qualified Ecologist) shall discuss mitigation measures with Metrolinx - Environment Program and Assessment Department staff. In addition, Metrolinx will consult with 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.

Construction

Provincially Significant Wetland and Fish Habitat: Mitigation will be implemented as follows:

- A qualified Environmental Inspector[34] is required throughout the construction period to ensure that protection measures are implemented, maintained and enforced.
- 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.
- ESC and Dewatering Plans will be developed prior to construction in consultation with the TRCA and LSRCA and will conform to construction industry BMPs and recognized standard specifications. The ESC Plan shall also take into account the GGHACA ESC Guidelines for Urban Construction (2006);
- 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;
- ESC and dewatering measures will be implemented prior to 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 of the construction site will be stabilized and re-vegetated as soon as conditions allow;
- ESC measures will be left in place until all areas of the construction site have been stabilized and will then be removed;
- Wet weather restrictions shall be applied during site preparation and excavation. Work will be avoided near watercourses during periods of excessive precipitation and/or excessive snow melt;
- 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. 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;
- A Construction Emergency Response and Communications Plan will be developed prior to construction and followed throughout the construction phase (includes spill response plans).
    - The Contractor will develop spill prevention and contingency plans and have them in place prior to construction of the BRCE 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 watercourses will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. Spills will be reported to the Ontario Spills Action Centre at 1-800-268-6060.
    - Dust from the work areas will be controlled through suppressants (e.g., water).
- 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; and
- A Construction Emergency Response and Communications Plan will be developed prior to construction and implemented throughout the construction phase (includes spill response plans).
- All requirements under the OWRA, R.S.O. 1990, c. O.40 with respect to the quality of water discharging into natural receivers will be met, including the following mitigation measures and best practices:
- 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.

Provincially Significant Wetland: All requirements under the *Invasive Species Act* will be met, including the following mitigation measures:

- All disturbed areas of 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);
- The SMP will include a strategy to prevent Bank Swallow nesting in stockpiled or exposed soils.
- 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; and;
- If extensive invasion of non-native species is identified as a result of the BRCE Project, contingency measures may include an applicable herbicide application. A herbicide application plan will be developed as required and submitted to the applicable conservation authority for review.

[34] *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 erosion and sediment control 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.*

Fish Habitat: The watercourse will be relocated in accordance with all Fisheries Act requirements. Specific mitigation measures and permitting requirements will be identified in the Aquatic Habitat Assessment Report to be prepared during the prior to construction. The watercourse is regulated by the LSRCA. Although Metrolinx is not required to meet LSRCA regulations, all plans associated with this watercourse will be sent to the LSRCA for voluntary review with the intent of meeting the spirit of regulatory requirements.

Operations and Maintenance

Provincially Significant Wetland and Fish Habitat: Mitigation will be implemented as follows:

- An Emergency Response and Communications Plan will be developed and followed throughout the operations and maintenance phase (includes spill response plans);
- Metrolinx will develop spill prevention and contingency plans for the train layover facility. 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 watercourses or 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.

4.5.1.3 Net Effects

Pre-Construction Land Clearing/Property Acquisition

Human-made Wetland, Wildlife Habitat and Species at Risk: The wetland is human-made and relatively young with a lack of diversity. As such, it is expected that any compensation would result in a higher quality wetland with a greater wildlife habitat function. Compensation locations will be identified to ensure there is no net loss within each watershed.

If the habitat is confirmed to be significant, compensation will be provided in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects. The meadow and thicket community is disturbed and includes a high number of non-native and invasive species. As such, it is expected that any compensation would result in a higher quality meadow habitat with a greater wildlife habitat function.

Nests of Migratory Birds: Construction activities will be carried out to avoid injury to wildlife. Any wildlife inadvertently injured as a result of construction activities will be limited to a very small number of individuals that will not affect species at the population level. Tree removals will take place outside of the breeding bird timing window to the extent practical to avoid effects to migratory birds.

Construction

Provincially Significant Wetland and Fish Habitat: Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. All dewatering will be conducted in accordance with regulatory requirements. As such, no net effects are anticipated.

Provincially Significant Wetland: Metrolinx will work in accordance with the requirements of the *Invasive Species Act*. As such, no net effects are anticipated.

Fish Habitat: All work will be carried out in accordance with the *Fisheries Act*, thus no net effects are anticipated.

Operations and Maintenance

Provincially Significant Wetland and Fish Habitat: Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.

4.5.1.4 Monitoring Activities

Pre-Construction Land Clearing/Property Acquisition

Human-made Wetland, Wildlife Habitat and Species at Risk: If Endangered or Threatened Species are found monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA, 2007. If no Endangered or Threatened Species are found, the following monitoring will be applied:

- An 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
- The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.

Nests of Migratory Birds: An Environmental Inspector will regularly monitor construction to confirm that activities do not encroach into nesting areas or disturb active nesting sites.

Construction

Provincially Significant Wetland and Fish Habitat: The following monitoring will be applied:

- An Environmental Inspector will conduct regular inspections to confirm ESC measures are functioning properly and are properly maintained throughout the construction phase;
- An Environmental Inspector is required to inspect and confirm ESC measures are functioning properly and are properly maintained throughout the construction phase. Workers will report any instances of spills to their supervisors;
- ***Provincially Significant Wetland:*** 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% survival rate and confirm that non-native and invasive species are not becoming pervasive as a result of the BRCE Project, unless otherwise specified within the Vegetation Compensation Protocol for Metrolinx RER Projects.

Operations and Maintenance

Provincially Significant Wetland and Fish Habitat: Layover staff and maintenance contractors are responsible for reporting spills and other issues and ensuring their timely resolution.

Fish Habitat: Monitoring activities will be developed in the Aquatic Habitat Assessment Report to be prepared prior to the construction phase. A monitoring program will be developed to meet all requirements of the *Fisheries Act* and any permit or approval conditions.

4.5.2 Trees

4.5.2.1 Potential Effects

Construction

The construction of the layover facility will result in the removal of 31 trees (refer to Table 4-16). Calculation of these removals was estimated using aerial photography and field notes due to access restrictions.

Table 4-16: Tree Removals Required to Accommodate the Proposed Bradford Layover Facility

Municipality	Feature	Mileage	Total [1]
Town of Bradford West Gwillimbury	Bradford Layover Facility Existing ROW	42.62 – 43.05	0
	Bradford Layover Facility Proposed ROW	42.62 – 43.05	31

[1] *Removals are estimated from aerial photography. Access was limited to the rail corridor land at the time of this study. No detailed data could be documented for species, DBH or condition for trees.*

Operations and Maintenance

Deterioration of trees' vitality that are adjacent to the layover facility over time due to new growing conditions for the trees (e.g., sunscald).

4.5.2.2 Mitigation Measures

Construction

Where tree permits are required on municipal land and private property adjacent to the ROW, Metrolinx will work with authorities as necessary to obtain all applicable permits and approvals. As an ongoing measure, Metrolinx is also currently consulting with conservation authorities and municipalities to establish a Vegetation Compensation Protocol for Metrolinx RER Projects. 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 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. The goal is to reduce administrative permitting burden for trees affected within long stretches of the rail corridor.

For Trees within Metrolinx Property: Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property. This will involve categorizing trees by community type/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with applicable conservation authorities and affected municipalities to develop the final compensation plan.

Conservation Authorities: For vegetation removals within conservation authority lands where required, applicable removal and restoration requirements will be followed.

Federal lands: For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements will be followed.

Tree End Use: Metrolinx will develop options for the end use of trees removed from Metrolinx property e.g. reuse/recycling options.

A Certified Arborist will complete an assessment of trees within and on lands immediately adjacent to the ROW prior to construction to determine required TPZs and protection measures. This assessment will determine the total number of tree removals required and determine extent of impacts to off-site trees.

The TPZ and barriers must be implemented prior to commencement of construction around retained trees to prevent damage or removal. The Environmental Inspector will regularly monitor the state of the TPZ.

A Certified Arborist will inspect and assess the trees adjacent to the facility prior to commencement of use of the layover facility to identify hazardous limbs and trees for removal to prevent injury or damage to people and property.

In locations where trees will be preserved but injuries are anticipated (e.g., root severance), mitigative measures carried out by or under the direction of a Certified Arborist will occur (e.g., root pruning) in coordination with the construction.

Operations and Maintenance

Maintenance, seasonal pruning or removal may be required to prevent woody material from falling on the layover tracks and/or rail ROW by a Certified Arborist. If a tree belonging to an adjacent landowner has failed as result of the implementation of the BRCE Project, tree replacement may be required as compensation.

4.5.2.3 Net Effects

Construction

Where on-site compensation cannot be accomplished within the Landscape Plans, Metrolinx will work with the conservation authorities and municipal agencies to explore off-site compensation. The Vegetation Compensation Protocol for Metrolinx RER Projects to be determined between Metrolinx, conservation authorities, and municipalities will be applied to offset the loss of tree canopy.

Operations and Maintenance

Tree canopy will be reduced until compensation plantings can replace or enhance the canopy coverage, as required.

4.5.2.4 Monitoring Activities

Construction

A qualified Environmental Inspector is required throughout the construction period to ensure that protection measures are implemented, maintained and enforced. This personnel will implement tree protection plans, monitor construction for unauthorized encroachment by contractors into vegetated areas and TPZs and monitor silt fencing and/or tree protection barriers to confirm proper installation and functionality. This will ensure that impacts to protected trees and off-site lands are protected for the duration of the construction. If the silt fencing and tree protection are not functioning, alternative measures will be implemented and prioritized above other construction activities. A post-construction assessment of the trees adjacent to the construction zone by a Certified Arborist is recommended to occur.

The Contractor that installs the edge management, landscape, mitigation and/or compensation plantings is responsible for tending to the plant material as site conditions (e.g., drought conditions) require for the length of the warranty period. A Landscape Architect (licensed to practice in the province of Ontario) or qualified designate

will be required to confirm the success of plant establishment through warranty inspections.

Inspections by a Certified Arborist may be required through the construction period to identify dead trees or limbs adjacent to the ROW.

Operations and Maintenance

Metrolinx routine track inspections will identify dead trees or limbs adjacent to the layover facility in order for the maintenance and reduction of risk.

A Certified Arborist will inspect and assess trees on-site and on lands immediately adjacent annually (at minimum) from the Metrolinx property.

4.5.3 *Archaeological Resources*

Construction

Land-disturbing activities have the potential to impact archaeological resources. The likelihood of encountering or impacting an archaeological resource depends on the proximity of the work area in relation to criteria indicative of archaeological potential. The lands for the Bradford Layover Facility were determined to be disturbed by previous land clearing and construction activities and no potential effects related to archaeological resources are anticipated during land clearing.

Operations and Maintenance

No potential effects related to archaeological resources are anticipated.

4.5.3.1 *Mitigation Measures*

Construction

No mitigation measures are required. In the event that previously undocumented archaeological remains are found during land clearing, the proponent or person discovering the archaeological resources will cease alteration of the site immediately, and the licenced consultant archaeologist, approval authority, and the Cultural Programs Unit of the Ministry of Tourism Culture and Sport (MTCS) will be immediately notified. In the event that human remains are discovered, then local law enforcement (e.g., local police force or the Ontario Provincial Police) and the Office of the Chief Coroner for Ontario will be immediately notified to review the discoveries and confirm that the site is not of forensic interest. Non-forensic findings will be subsequently communicated to the Cemeteries Registrar. Excavation will continue within the study area until a sterile 10 metres buffer is identified between the limit of excavation and any identified burials. Any documented human remains will be subjected to protection and avoidance by effects proposed by the BRCE Project.

Operations and Maintenance

No mitigation measures are required.

4.5.3.2 *Net Effects*

Construction

As there are no anticipated potential effects related to archaeological resources at the Bradford Layover Facility, no net effects to archaeological resources are expected.

Operations and Maintenance

No net effects related to archaeological resources are anticipated.

4.5.3.3 *Monitoring Activities*

Construction

The Environmental Inspector shall monitor land-disturbing activities to confirm they remain within the study area. 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

No monitoring is required.

4.5.4 *Cultural Heritage Resources*

4.5.4.1 *Potential Effects*

Construction

No CHRs were identified within or adjacent to the proposed location of the Bradford Layover Facility, and therefore no potential effects to CHRs are anticipated.

Operations and Maintenance

No potential effects are anticipated.

4.5.4.2 *Mitigation Measures*

Construction

No mitigation measures are required.

Operations and Maintenance

No mitigation measures are required.

4.5.4.3 *Net Effects*

Construction

No net effects are anticipated.

Operations and Maintenance

No net effects are anticipated.

4.5.4.4 *Monitoring Activities*

Construction

No monitoring activities are required.

Operations and Maintenance

No monitoring activities are required.

4.5.5 Socio-Economic and Land Use Characteristics

4.5.5.1 Potential Effects

Pre-Construction Land Clearing/Property Acquisition

A Socio-Economic and Land Use Characteristics Report provided in Appendix F of this EPR has been prepared to evaluate potential effects related to socio-economic and land use characteristics that could occur as a result of the BRCE Project. As noted therein, potential property requirements associated with the Bradford Layover Facility include 11 individual properties (includes 10 full property acquisitions (which includes three businesses), and one partial property acquisition), resulting in a total property requirement of 9.64 ha. Acquisition requirements are summarized in Table 4-17.

Table 4-17: Property Acquisition Associated with the Bradford Layover Facility

Mile Marker	PIN	Business Name	Total Area of Property (ha)	Area Required for Facility (ha)	Total Land to be Acquired (ha)
43.04	580410059	Shor-Cais Foundation Contractors & Engineers Ltd.	0.99	0.60 (61%)	0.99 (100%)
42.98	580410060, 580410061	Servicestar Freightways Inc.	1.98	1.21 (61%)	1.98 (100%)
42.92	580410062, 580410063, 580410064	Toromont Industries Ltd.	2.34	1.34 (57%)	2.34 (100%)
42.80	580410065, 580410066, 580410067, 580410068	Millford Developments Ltd. (No business on site)	4.08	3.20 (78%)	4.08 (100%)
42.61	580410069	HomeLife/Aurora Realty Ltd.	1.34	0.25 (19%)	0.25 (19%)

Development of the Bradford Layover Facility will require the acquisition of approximately 9.64 ha of private property. The potential effects to individual property owners due to land acquisition to accommodate the Bradford Layover Facility are as follows:

Commercial and Industrial Lands: Three businesses (as identified in Table 4-17 above) will require full property acquisition, necessitating full removal of the business and all associated buildings. In addition, the Millford Development Limited property (which currently has no on-site buildings), will require full property acquisition and will result in loss of potential for future development. One business (HomeLife/Aurora Realty Ltd.) will require partial property acquisition. The partial property acquisition also has the potential to limit future expansion, including potential parking areas.

Land Use Near Closed Landfill: Development of the Bradford Layover Facility requires acquisition of property within 500 metres of a former landfill (presently closed). Thus, prior to development, an assessment in accordance with Section 9.6 of the Town's OP (relates to Guideline D-4 Land Use On or Near Landfills and Dumps, MOE, 1994) will need to be completed to determine the factors that may affect the land use (e.g., ground and surface water contamination by leachate, surface runoff, ground settlement, visual impact, soil contamination and hazardous waste, landfill- generated gases). This assessment will be completed by Metrolinx prior to construction.

Construction

Commercial and Industrial Lands: Given that the properties surrounding the proposed Bradford Layover Facility are commercial and industrial, increased noise, vibration, dust and other typical nuisance effects associated with a construction site are likely to have only a minor effect.

Vehicle, Pedestrian, Cyclist and Agricultural Traffic: Any temporary road closures or lane restrictions necessary for construction activities may affect access to local transit routes, and other businesses in the area. The assessment documented in the TIA (provided in Appendix I of this EPR), concluded that, given the relatively small size of the Bradford Layover Facility and its location within the well-established Artesian Industrial Park, any potential construction-related traffic impacts of this facility are likely to be minor, both during the construction phase and during the operations/maintenance phase.

Operations and Maintenance

Commercial and Industrial Lands: There is potential for nuisance effects (e.g., increased noise, vibration, and dust) associated with operations and maintenance at the facility. However, the layover facility will be located within an existing industrial area, comprised of compatible facilities and operations. Thus, the potential for increased nuisance effects is minimal.

4.5.5.2 Mitigation Measures

Pre-Construction Land Clearing/Property Acquisition

Commercial and Industrial Lands: Metrolinx will work individually with each business owner to identify individual compensation and ensure that successful relocation can be achieved. Specific property requirements will be confirmed prior to construction to determine property impacts. Property acquisition required for the BRCE Project will be undertaken by Metrolinx, with the objective being to provide fair market value compensation to affected property owners in accordance with applicable laws. Metrolinx will work with the Town of Bradford West Gwillimbury to make a concerted effort to relocate the three affected businesses in a comparable location within the Town (e.g., Reagens Industrial Park, located to the west at the intersection of Line 8 and Sideroad 10).

Land Use Near Closed Landfill: In keeping with Guideline D-4 Land Use On or Near Landfills and Dumps (MOE, 1994), Metrolinx will complete an assessment to determine the potential impacts on the land use, and will detail any required mitigation measures.

Construction

Commercial and Industrial: Metrolinx will implement applicable mitigation measures related to noise, vibration, and air quality as described in the Air Quality Study and the Noise and Vibration Impact Assessment, provided in Appendices G and H, respectively.

Vehicle, Pedestrian, Cyclist and Agricultural Traffic: Adequate construction hauling routes will be determined in consultation with the Town of Bradford West Gwillimbury. A site-specific Traffic Control and Management Plan will be prepared and implemented prior to construction and prior to 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. Additional details are presented in the TIA provided in Appendix I of this EPR.

Operations and Maintenance

All Land Uses: Applicable BMPs will be employed by Metrolinx to confirm that noise, vibration, and air emissions are all within regulatory limits and effects are minimized. Detailed mitigation plans are outlined in the Air Quality Study and the Noise and Vibration Impact Assessment. The use of electric trains on this corridor in the future will reduce air quality effects.

4.5.5.3 Net Effects

Pre-Construction Land Clearing/Property Acquisition

Commercial and Industrial Lands: The effects to properties will be mitigated by providing fair market value compensation in accordance with applicable laws and through negotiations with affected property owners. There may be temporary effects to employment in the short-term as businesses relocate. However, overall net effects are expected to be minimal.

Land Use Near Closed Landfill: Any net effects will be detailed in the assessment to be completed by Metrolinx prior to construction, as per Guideline D-4 Land Use On or Near Landfills and Dumps (MOE, 1994).

Construction

Commercial and Industrial Lands: The temporary nuisance effects will be mitigated through compliance with regulatory requirements and the prescribed noise, vibration and air quality mitigation measures noted above.

Vehicle, Pedestrian, Cyclist and Agricultural Traffic: The temporary restrictions to access points will be minimized during construction. With the mitigation proposed, net effects will be minimal and temporary in duration.

Operations and Maintenance

All Land Uses: The nuisance effects during operations and maintenance will be mitigated through compliance with regulatory requirements and the prescribed noise, vibration and air quality mitigation measures noted above.

4.5.5.4 Monitoring Activities

Pre-Construction Land Clearing/Property Acquisition

Commercial and Industrial Lands: No monitoring activities are required.

Land Use Near Closed Landfill: Applicable monitoring activities will be determined following completion of the Guideline D-4 assessment.

Construction

Commercial and Industrial Lands: 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.

Vehicle, Pedestrian, Cyclist and Agricultural 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.

Operations and Maintenance

All Land Uses: Metrolinx have ongoing inspection schedules to monitor the effectiveness of its GO Transit operations. In addition, Metrolinx has an existing complaints procedure in place to address any concerns raised by neighbouring land owners, municipalities and/or the public.

4.5.6 Air Quality

4.5.6.1 Potential Effects

Construction

The Bradford Layover Facility generally involves the construction of new rail and layover facility infrastructure at an existing industrial site. Therefore, air emissions associated with the construction of the Bradford Layover Facility typically include:

- Fugitive dust emissions resulting from:
  - The necessary soil excavation and filling activities required to accommodate the layover facility;
  - The demolition of structures necessary to accommodate the layover facility;
  - Cutting of existing concrete;
  - The stockpiling of soil and other friable construction materials; and
  - The transport of friable fill materials via dump trucks.

In addition, emissions resulting from the combustion engines of construction equipment will also be generated.

Operations and Maintenance

Potential air emissions during the operations and maintenance phase of the Bradford Layover Facility primarily include emissions from the trains and the facility's maintenance vehicles and equipment.

4.5.6.2 Mitigation Measures

Construction

The Contractor will be required to implement the same BMPs as outlined above for the construction of rail infrastructure and GO Station improvements (see Section 4.3.6.2**Error! Reference source not found.**).

Operations and Maintenance

Operations and maintenance of the Bradford Layover Facility will be carried out in accordance with applicable regulations and standards, including Ontario's AAQC (PIBS#6570e01) (MOE, 2012). Maintenance vehicles and equipment will be equipped with current emission controls, and kept in a state of good repair. Long-term emissions from trains at the facility are expected to be minimal upon replacement of the existing diesel locomotives with electric locomotives.

4.5.6.3 Net Effects

Construction

The potential air quality effects associated with the construction phase of the Bradford Layover Facility are expected to be temporary and localized to the areas adjacent the facility. Effects will be reduced to the extent possible through implementation of construction BMPs.

Operations and Maintenance

Long term net effects of air quality at the Bradford Layover Facility are expected to be minimal upon replacement of existing diesel with electric trains.

4.5.6.4 Monitoring Activities

Construction

It is recommended that construction of the Bradford Layover Facility follow the same monitoring and response protocols as outlined above for rail infrastructure and GO Station improvement construction.

Operations and Maintenance

Metrolinx has ongoing inspection schedules to monitor the effectiveness of its GO Transit operations. An existing complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.

4.5.7 Noise

4.5.7.1 Potential Effects

Construction

Construction activities associated with the proposed Bradford Layover Facility likely to cause potential noise effects generally include:

- Demolition of existing structures;
- Breaking of asphalt and concrete through the use of hydraulic hammers or jack hammers;
- Soil excavation, grading, compaction, and pile driving; and
- Track installation.

Potential noise effects are generally limited to the lands adjacent to the proposed Bradford Layover Facility. These potential noise effects may be considered a nuisance to affected building occupants.

Operations and Maintenance

There will be no changes to the existing Barrie Layover Facility as part of the BRCE Project. Noise impacts from the proposed Bradford Layover Facility are predicted to be below the applicable exclusion limit.

Based on all inputs and criteria outlined in Section 3.3.10 noise modelling was conducted to evaluate the Adjusted Noise Impact between the existing conditions and Future, Scenarios at the Bradford Layover Facility. The noise modelling results are summarized in Table 4-18. The modelling results and assessment are documented in further detail in the Noise and Vibration Impact Assessment, provided in Appendix H of this EPR.

Table 4-18: Noise Impacts from Existing and Proposed Layover Facilities

Sensitive Receptor ID	Period	Location	Predicted Project Noise Levels (dBA)[1]		Objective Limit (dBA)[2]	Adjusted Noise Impact (dB)	Adjusted Impact Rating	3 dB or Greater Increase?[3]	Mitigation Investigation Required?
			Existing	Future Scenarios 1 & 2					
SR105	Day	Future Bradford Layover Facility	-	33	45	-12	Insignificant	No	No
	Night		-	42	45	-5	Insignificant	No	
SR106	Day		-	38	45	-6	Insignificant	No	No
	Night		-	41	45	-3	Insignificant	No	
SR159	Day	Barrie Layover Facility	38	38	55	-17	Insignificant	No	No
	Night		40	40	55	-15	Insignificant	No	
SR160	Day		50	50	55	-5	Insignificant	No	No
	Night		55	55	55	-1	Insignificant	No	
SR161	Day		56	56	55	1	Insignificant	No	Yes
	Night		58	58	55	3	Noticeable	Yes[4]	
SR162	Day		39	39	55	-16	Insignificant	No	No
	Night		45	45	55	-10	Insignificant	No	

Notes:

[1]. The L_{EQ} is evaluated for a 1-hour period

[2]. For an existing layover facility, the objective is the higher of the ambient sound level, combined with the existing industry, or 55 dB. For site selection of a future layover facility, the objective is the higher of the ambient sound level, combined with the existing industry, or 45 dB.

[3]. The potential to mitigate is considered when a noticeable (or greater) impact is predicted. This is equivalent to an increase of 3 dB or greater, relative to the objective level, as per the MOECC/GO Draft Protocol for Noise and Vibration Assessments. An adjusted noise impact greater than 3 dB requires the investigation of mitigation.

[4]. Although the adjusted noise impact is larger than 3 dB, there will be no changes to the existing Barrie Layover Facility as part of the BRCE Project. Therefore, no mitigation was investigated.

4.5.7.2 Mitigation Measures

Construction

Construction BMPs will be implemented to minimize any adverse effects from construction noise at nearby sensitive receptors. These measures will include, but not be limited to the mitigation measures described in Section 0 for the construction of the proposed rail infrastructure.

Operations and Maintenance

To reduce sound levels associated with the Barrie Layover Facility to meet the MOECC/GO Draft Protocol and MOECC's NPC-300 exclusion limits, a noise barrier is proposed, as identified in the Noise and Vibration Impact Assessment provided in Appendix H of this EPR. For the proposed Bradford Layover Facility, no noise mitigation is required.

4.5.7.3 Net Effects

Construction

Construction related impacts will be minimized through implementation of applicable construction BMPs. Thus, no net effects are anticipated.

Operations and Maintenance

There are no net effects associated with operations and maintenance of existing Barrie Layover Facility and the proposed Bradford Layover Facility.

4.5.7.4 Monitoring Activities

Construction

Construction activities will be monitored by a qualified Environmental Inspector who will check the effectiveness of the mitigation measures and construction BMPs to confirm they are being employed to minimize any adverse effects from construction noise at nearby sensitive receptors. This includes, but is not limited to, the monitoring measures described in Section 4.4.7 for the construction of the new rail infrastructure.

Operations and Maintenance

Metrolinx and GO Transit have ongoing inspection schedules to monitor the effectiveness of their operations. A complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.

4.5.8 Vibration

4.5.8.1 Potential Effects

Construction

Construction activities associated with the Bradford Layover Facility likely to cause potential vibration effects generally include:

- Demolition of existing structures;
- Breaking of asphalt and concrete through the use of hydraulic hammers or jack hammers; and
- Soil excavation, grading, compaction, and pile driving.

Potential vibration effects are generally limited to the lands adjacent the Bradford Layover Facility. These potential vibration effects may be considered a short term nuisance to affected building occupants.

Operations and Maintenance

All of the sensitive receptors that surround the future layover facility are located more than 75 metres away from the proposed layover facility, and are not expected to experience any noticeable vibration impacts. In keeping with Metrolinx-GO Transit Adjacent Development Guidelines (2013), vibration effects need not be assessed when the receptor is located farther than 75 metres from the rail corridor or facility.

4.5.8.2 Mitigation Measures

Construction

Construction BMPs will be implemented to minimize any adverse effects from construction vibration at nearby sensitive receptors. These measures will include, but not be limited to the mitigation measures described above for the construction of the proposed rail infrastructure.

Operations and Maintenance

As there are no anticipated effects associated with operations and maintenance activities, no mitigation measures are required.

4.5.8.3 Net Effects

Construction

Construction related impacts will be minimized through implementation of applicable construction BMPs. Thus, no net effects, including damage to neighbouring property or infrastructure, are anticipated.

Operations and Maintenance

No impacts or mitigation measures are required as a result of operations and maintenance activities. Thus, there are no net effects associated with operations and maintenance of the Bradford Layover Facility.

4.5.8.4 Monitoring Activities

Construction

Construction activities will be monitored by a qualified Environmental Inspector who will check the effectiveness of the mitigation measures and construction BMPs to confirm they are being employed to minimize any adverse effects from construction vibration at nearby sensitive receptors. In the event that mitigation is found to not be effective, the Contractor will be notified to implement revised mitigation measures designed to improve effectiveness.

Should the Contractor or Environmental Inspector notice, or be made aware of property or infrastructure damage caused by construction vibration, the Contractor will immediately stop work in the area. In addition, the Contractor will develop a restoration plan in consultation with the property or infrastructure owner, and will complete the work using alternative methods to prevent further damage.

The Contractor will prepare and implement a complaints protocol for receiving, investigating and addressing construction vibration complaints received from the public. The protocol will include a plan for how the public is to be notified of their options for lodging a complaint.

Operations and Maintenance

No ongoing monitoring is required during the operations and maintenance phase.

4.5.9 *Traffic and Transportation Infrastructure*

4.5.9.1 *Potential Effects*

Construction

Potential effects during construction will primarily relate to the need for construction traffic to access the proposed layover facility site. However, since the site is located within an existing industrial park, it is not anticipated that the construction traffic will have any significant effect on the road network. Given that the layover facility is located within a long-established industrial park with good site access, the traffic effects of this facility are considered to be minor during the construction phase.

Operations and Maintenance

Since there are only 32 parking spaces proposed at the site, the Bradford Layover Facility will not generate a significant amount of traffic. As such, it is expected that the site traffic will have a negligible effect on the surrounding road network.

The Barrie rail corridor intersects Industrial Road approximately 680 metres south of the southern boundary of the proposed layover facility. It is assumed that the volume of traffic travelling over the crossing is low due to its location and the minor amount of industrial activity to the east. Therefore, it is projected that the increased volume of trains (that will be travelling at low speeds) near the layover facility will not have a significant effect on traffic at the crossing. Given its location within a long-established industrial park, the traffic effects of this facility are considered to be minor during the operations/maintenance phase.

The Town of Bradford West Gwillimbury OP identifies a potential Highway 400/404 Link (Bradford Bypass), proposed to be located immediately to the south of the layover facility lands. This potential future Highway 400/404 Link (Bradford Bypass) is proposed to be grade separated over the Barrie rail corridor, and it is not anticipated to be affected by layover facility operations.

4.5.9.2 *Mitigation Measures*

Construction

During the detailed design of the Bradford Layover Facility, Metrolinx will liaise with the Town of Bradford West Gwillimbury to identify and address any construction traffic related issues and to determine adequate construction hauling routes. At that time, a site-specific Traffic Control and Management Plan will be prepared, identifying the specific mitigation requirements to address anticipated effects.

Operations and Maintenance

No mitigation measures are required during the operations/maintenance phase.

4.5.9.3 *Net Effects*

Construction

The potential construction-related traffic effects will be minimized by the implementation of the site-specific Traffic Control and Management Plan, with some negligible net effects possible.

Operations and Maintenance

No traffic related net effects are anticipated during the operations/maintenance phase.

4.5.9.4 *Monitoring Activities*

Construction

Metrolinx will carry out construction inspection for the Bradford Layover Facility works to confirm that the site-specific Traffic Control and Management Plan is effectively implemented and the prescribed mitigation measures are working as planned.

Operations and Maintenance

No traffic related monitoring is required during the operations/maintenance phase.

4.5.10 *Utilities and Municipal Infrastructure*

4.5.10.1 *Potential Effects*

Construction

The existing servicing to the existing structures on the properties required for the Bradford layover will need to be decommissioned or modified to allow for the construction of the facility.

Operations and Maintenance

No effects are anticipated.

4.5.10.2 *Mitigation Measures*

Construction

Mitigation measures will be further reviewed prior to the construction phase for known utility/infrastructure crossings and utilities/infrastructure running along the corridor in coordination with the utility/infrastructure owner. The following mitigation measures will be considered prior to the construction phase:

Protect – The utilities/infrastructure are left in place and protected through barriers and other methods while construction occurs around them; or

Relocation/Remove – Utilities/infrastructure are rerouted around the area of construction in cases where utilities are active or removed in cases where the utility is abandoned.

Operations and Maintenance

No mitigation is required.

4.5.10.3 *Net Effects*

Construction

No net effects are expected with respect to utilities.

Operations and Maintenance

No net effects are anticipated.

4.5.10.4 *Monitoring Activities*

Construction

Monitoring of utility/infrastructure relocation and protection will be in accordance with the utility/infrastructure owner's protocols.

Operations and Maintenance

No monitoring is required.

4.6 Impact Assessment, Mitigation and Monitoring Plan Summary

The Impact Assessment, Mitigation and Monitoring Plan is summarized in the tables below based on the following Project components:

Table 4-19 – Rail Infrastructure;

Table 4-20– GO Station Improvements; and

Table 4-21 – Proposed Bradford Layover Facility.

Table 4-19: Impact Assessment, Mitigation Measures, Net Effects, and Monitoring Activities Summary Table – Rail Infrastructure

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
Natural Environment – Pre-Construction Land Clearing/Property Acquisition							
R1	Significant Natural Areas	Removal of portions of PSW, Non-Significant and unevaluated wetlands, Significant Woodlands, ANSIs and Significant Valleylands.	A qualified Environmental Inspector is required throughout the construction period to confirm that protection measures are implemented, maintained and enforced. Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects. Clearing and grubbing will occur from the track-side of the natural area and a detailed ESC Plan will be developed to limit damage to the remaining natural areas. 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. Detailed clearing, ESC Plans and restoration plans will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects and approved landscaping plans developed prior to construction. In wetlands: Wetlands will be restored as necessary to maintain the stability and function of the wetland and will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects and approved landscaping plans developed prior to construction. In woodlands: • 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 plywood clad boarding or an equivalent material approved by the municipality.	Metrolinx/Contractor	There will be reduced on-site vegetation but an overall increase in natural areas through off-site compensation	Pre-construction land clearing activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified work zones. The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.	Contractor/ Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• No stockpiles, storage or disturbance to grade will occur within the TPZ to minimize soil compaction and root damage. In Valleylands: • Work on steep slopes will be limited to the extent possible. In areas subject to conservation authority regulations, detailed clearing, ESC Plans and restoration plans will be submitted to the TRCA and LSRCA for voluntary review.				
R2	Significant Natural Areas	Construction laydown areas and easements identified prior to construction could potentially result in the loss of, or disturbance to, natural areas present within the study area.	• All construction laydown areas and easements will be located to avoid natural features (Candidate and Confirmed) to the extent possible. • 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. • 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.	Metrolinx/ Consultant (Detailed Design)/Contractor	Any disturbed or damaged areas will be returned to their previous condition. As such, no net effects are anticipated.	An Environmental Inspector is required to 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.	Consultant (Environmental Inspector)
R3	Wildlife Habitat	Removal of portions of Significant and Candidate SWH and Habitat for SCC.	• Where habitats could not be identified due to access restrictions (e.g., reptile hibernacula, rare woodlands, seeps and springs), pre-construction surveys will be conducted prior to the construction phase. 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 will take place outside of the breeding bird timing window, generally from April 1st to August 31 (Different windows may apply to habitats of SAR, subject to permitting requirements). • If clearing must occur within this window, a qualified Ecologist /Avian Biologist will first search	Metrolinx/Consultant (Detailed Design)/ Contractor	There will be reduced on-site wildlife habitat but an overall increase in habitat through off-site compensation. Species-specific net effects are as follows: Confirmed Significant Deer Wintering and Yarding Areas: Wintering and Yarding Areas to be cleared directly adjacent to the existing corridor are not expected to be well used	An 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. The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			the affected area. Any active nests will be flagged and all clearing within the associated habitat will be avoided until the Ecologist confirms that the birds have fledged and the nest is no longer active. • Habitats with a critical timing window at a different time of year will be assessed by a qualified Ecologist/Avian Biologist prior to any clearing to confirm that the habitat is not in use. If the habitat is being used for critical life functions, the area will be flagged and all clearing within the associated habitat will be avoided until the area is no longer in use. • If a nesting migratory bird (or SAR protected under ESA, 2007) is identified within or adjacent to the construction site, all activities will stop and the Contractor (with assistance from a qualified Ecologist/Avian Biologist) shall discuss mitigation measures with Metrolinx - Environment Program and Assessment Department staff. 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 Environment and Climate Change Canada (ECCC). • Compensation for habitats located within Significant Natural Areas will follow the mitigation measures associated with the Significant Natural Areas listed in the Features Column of this table. • Where habitats do not coincide with a Significant Natural Area, compensation measures will be developed, as appropriate. Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation		by deer. Thus, no net effects are anticipated. Confirmed Significant Osprey Nesting, Perching and Foraging: No net effects are anticipated as a replacement nesting site will be created, if required. Confirmed Significant Terrestrial Crayfish Habitat: A small amount of Terrestrial Crayfish Habitat may be lost and will be confirmed prior to construction. Any disturbed habitat will be restored. Thus, there may be minor effects but they are not expected to affect terrestrial crayfish species at the population level.		

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			Compensation Protocol for Metrolinx RER Projects. Species-specific mitigation is as follows: • Deer Wintering/Yarding Areas: Areas immediately adjacent to the existing corridor are not likely to be used extensively by deer and therefore no additional mitigation or compensation is required, other than any overlapping habitats or features that are subject to mitigation associated with other overlapping natural feature types. • Significant Osprey Nesting, Perching and Foraging: During the detailed design phase, the rail infrastructure will be designed to avoid the loss of the nest to the extent possible. If the nest cannot be accommodated in its current position, the MNRF will be consulted to develop a relocation plan. A plan would be developed in consultation with the MNRF and may include installation of a nesting platform in an alternative location and removal of the existing nest outside of the breeding season. • Significant Terrestrial Crayfish Habitat: Work in this area will be limited to the extent possible. Disturbed areas will be restored to their original condition. Culvert design, land clearing, ESC Plans and restoration plans will be submitted to the TRCA and LSRCA for voluntary review.				
R4	Species at Risk	Removal of areas identified as Significant or Candidate Significant Habitat of Endangered and Threatened Species.	All requirements of the ESA, 2007 will be met including the following: • Detailed site surveys will be undertaken prior to construction to confirm the presence of the following species: • King Rail. • Least Bittern. • Eastern Whip-poor-wil.	Metrolinx/Consultant (Detailed Design)/Consultant (Environmental Inspector-Certified Butternut Health Assessor)/Landscape Architect	All requirements under the ESA, 2007, will be met, thus no net effects are anticipated. With regard to Candidate Significant Habitats for Bobolink and Eastern Meadowlark, no nesting habitat is expected to be present within the areas to be cleared. Thus,	Monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA, 2007. Butternut tree monitoring as determined by the MNRF and Metrolinx.	Consultant (Environmental Inspector)/Consultant (Environmental Inspector Certified Butternut Health Assessor)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• Blanding's Turtle. Little Brown Myotis, Northern Myotis, and Tri-colored Bat. • Findings of site surveys will be reported to the MNRF. • During the detailed design phase, the rail infrastructure 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 consulted and all requirements under the ESA, 2007 will be met. • Timing windows for any necessary removal of any Confirmed Endangered or Threatened Species habitat will be developed in consultation with the MNRF. • Should a SAR be encountered, all work will cease within the immediate work area and the MNRF will be contacted within 48 hours or two business days. With regard to Butternut trees: • Detailed site investigations will be undertaken prior to the construction phase to confirm whether any additional Butternut trees are present within areas to be cleared. • 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 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. • Where loss of a retainable tree cannot be avoided, the MNRF will be consulted and all requirements		no net effects are anticipated.		

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			under the ESA, 2007 will be met through the preparation of a Butternut Compensation Planting Plan. • If more than ten retainable trees must be removed, the exemption regulation will not apply and a permit may be required.				
R5	Nests of Migratory Birds	Clearing of trees, shrubs and ground vegetation has the potential to disturb or destroy nests of migratory birds.	• Any vegetation clearing will take place outside of the breeding bird timing window, generally from April 1 - to August 31. • 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 Ecologist confirms that the birds have fledged and the nest is no longer active. • If a nesting migratory bird (or SAR protected under ESA, 2007) is identified within or adjacent to the construction site, all activities will stop and the Contractor (with assistance from a qualified Ecologist/Avian Biologist) shall discuss mitigation measures with Metrolinx - Environment Program and Assessment Department In addition, Metrolinx will consult 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.	Consultant (Construction Supervision)/ Contractor	With implementation of the recommended mitigation measures, no net effects are anticipated.	An Environmental Inspector will regularly monitor construction to confirm that activities do not encroach into nesting areas or disturb active nesting sites.	Consultant (Environmental Inspector)
Natural Environment – Construction							
R6	Significant Natural Areas, Wildlife Habitat and Species at Risk	Grading and soil disturbance during construction can lead to erosion and sedimentation within significant natural features and watercourses affecting the quality of habitat, disturbing ground	• A qualified Environmental Inspector is required throughout the construction period to confirm that protection measures are implemented, maintained and enforced. • A SMP will be prepared by a qualified Professional as defined in O. Reg.153/04 for managing soil	Consultant (Detailed Design)/Contractor	Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As	An Environmental Inspector will conduct regular inspections to confirm ESC measures are functioning properly and are properly maintained throughout the construction phase.	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		vegetation and negatively affecting the quality of fish habitat.	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 and Dewatering Plans will be developed prior to construction in consultation with the TRCA and LSRCA and will conform to industry BMPs and recognized standard specifications. The ESC Plan will also take into account the GGHACA ESC Guidelines for Urban Construction (2006). • 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. • ESC and dewatering measures will be implemented prior to construction and maintained during the construction phase in accordance with the ESC and Dewatering Plans. • 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 of the construction site will be stabilized and re-vegetated as soon as conditions allow. • ESC measures will be left in place until all areas of the construction site have been stabilized and will then be removed. • Wet weather restrictions shall be applied during site preparation and excavation. Work will be avoided near watercourses during periods of excessive precipitation and/or excessive snow melt. • A Construction Emergency Response and Communications Plan will be developed prior to construction and followed throughout the construction phase (includes spill response plans).		such, no net effects are anticipated.		

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• The Contractor will develop spill prevention and contingency plans and have them in place prior to construction of the BRCE 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 watercourses will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. Spills will be reported to the Ontario Spills Action Centre at 1-800-268-6060.				
R7	Significant Natural Areas, Wildlife Habitat and Species at Risk	Stockpiled materials, equipment or construction activities could accidentally encroach into natural areas beyond the proposed ROW limits adding to the disturbance to natural features and increasing the quantity lost as a result of the BRCE Project, Soils beyond the proposed ROW limits could also become compacted or disturbed from activities extending beyond approved limits.	• 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 Plan will outline a process of resolving issues of extended encroachment, including clean-up, maintenance of ESC measures, and consideration of alternative ESC measures. • 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).	Consultant (Detailed Design)/Contractor	All effects are expected to be temporary, thus no net effects are anticipated.	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.	Consultant (Environmental Inspector)
R8	Significant Natural Areas, Wildlife Habitat and Species at Risk	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 groundwater quality and the health of vegetation and wildlife within natural areas.	• 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). • Deleterious substances (including stockpiled material) will be used and stored in a manner that prevents any of the substances from entering a natural feature. • Hazardous material and fuel storage, refueling and maintenance of construction equipment will occur within designated areas only.	Contractor	Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.	An Environmental Inspector is required to inspect and confirm ESC measures are functioning properly and are properly maintained throughout the construction phase. Workers will report any instances of spills to their supervisors.	Consultant (Environmental Inspector)

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			• The Contractor will develop spill prevention and contingency plans and have them in place prior to construction of the BRCE 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 watercourses or 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.				
R9	Significant Natural Areas, Wildlife Habitat and Species at Risk	Any disturbance to lands and vegetation clearing has the potential to allow invasive species to be introduced and spread through natural areas and these invasive species can prevent other native species from re-establishing.	• All disturbed areas of 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; and. • If extensive invasion of non-native species is identified as a result of the BRCE Project, contingency measures may include an applicable herbicide application. A herbicide application plan will be developed as required and submitted to the applicable conservation authority for review.	Contractor	Metrolinx will work in accordance with the requirements of the *Invasive Species Act*. Thus, no net effects are anticipated.	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% survival rate and confirm that non-native and invasive species are not becoming pervasive as a result of the BRCE Project, unless otherwise specified within the Vegetation Compensation Protocol for Metrolinx RER Projects.	Consultant (Environmental Inspector)
R10	Significant Natural Areas, Wildlife Habitat and Species at Risk	Dewatering required during the construction of any deep foundations or footings or other below-ground	• All requirements under the OWRA, R.S.O. 1990, c. O.40 with respect to the quality of water discharging into natural receivers will be met,	Contractor	All dewatering will be conducted in accordance with regulatory	An Environmental Inspector will be on-site during any dewatering within 120 metres of natural	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		(sub-surface) works has the potential to affect groundwater levels, wetland water levels and the hydrology of other natural features.	including the following mitigation measures and best practices: • 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. • If significant changes in water levels/seepage areas are noted, operations will cease until water levels recover.		requirements. As such, no net effects are anticipated.	features. The Environmental Inspector will confirm that the filter bag is working appropriately and confirm that no sediment is entering significant natural features or watercourse.	
R11	Significant Natural Areas, Wildlife Habitat and Species at Risk	Dust created as a result of construction has the potential to settle on adjacent vegetation, disturbing wildlife and their habitat.	• Dust from the work areas will be controlled through suppressants (e.g., water).	Contractor	Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.	An Environmental Inspector will regularly inspect dust emissions during construction to confirm dust control watering frequency and rates are adequate.	Consultant (Environmental Inspector)
R12	Significant Valleylands	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.	• 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 TRCA and 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.	Metrolinx/ Consultant (Detailed Design)/Contractor	All requirements for working in proximity to steep slopes and watercourses will be met. Metrolinx will continue to consult with TRCA/LSRCA throughout the detailed design process. Thus, no net effects are anticipated.	An Environmental Inspector will conduct regular inspections to confirm that all work is conducted in accordance with plans and any recommendations provided through the conservation authority voluntary review.	Consultant (Environmental Inspector)
R13	Barn Swallow Nests	Active Barn Swallow nests (regulated under the ESA, 2007) will likely to be destroyed or disturbed.	• Field surveys will be undertaken prior to the construction phase to confirm the number of nests present at the known locations and whether the nests remain active.	Metrolinx/Consultant (Detailed Design)	All work in, and around Barn Swallow nests will be conducted in accordance with the ESA, 2007. Thus,	An Environmental Inspector will conduct regular inspections to confirm that all work is conducted in accordance with the ESA, 2007,	Consultant (Environmental Inspector)

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			• During the detailed design phase, the rail infrastructure and bridges will be designed to avoid the loss of Barn Swallow nesting sites to the greatest extent possible. • Where loss or disturbance (e.g., due to any work on the bridges) cannot be avoided, the MNRF will be consulted and all requirements under the ESA, 2007, will be met, including any registration, compensation, replacement structures and/or permitting requirements.		no net effects are anticipated.	and any associated permits/approvals.	
R14	Linkage Areas and Deer Wintering/Yarding Areas	Accidental mortality could occur if wildlife inadvertently moves through construction zones with the highest risk area being the 14 linkage locations; Accidental mortality also possible adjacent to the Deer Wintering and Yarding Areas located in close proximity to the corridor.	• Silt fence will be used as wildlife exclusion fencing within all areas identified as Linkage Areas. • Speed limits will be posted along construction routes. • Should wildlife species move into a construction zone, the Environmental Inspector will move species out of work area. • Should a SAR be encountered that are not identified on relevant permits, all work will cease within the immediate work area and the MNRF will be consulted.	Consultant (Construction Supervision)/ Contractor	Construction activities will be carried out to avoid injury to wildlife. Any wildlife inadvertently injured as a result of construction activities will be limited to a very small number of individuals that will not affect species at the population level.	An Environmental Inspector will conduct regular inspections to confirm that all exclusion fencing is working appropriately.	Consultant (Environmental Inspector)

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R15	Fish Habitat	A total of 46 culvert and bridge locations that convey watercourses considered to be either direct or indirect fish habitat will have the potential to harm fish habitat due to in- and/or near-water work.	• An Aquatic Habitat Assessment will be prepared prior to 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. • 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.	Metrolinx/ Consultant (Detailed Design)/Contractor	All in-water and near-water works will be completed in accordance with the requirements of the *Fisheries Act* and industry BMPs. As such, no net effects are anticipated.	An Environmental Inspector will conduct regular inspections to confirm that all work is conducted in accordance with the *Fisheries Act* and any associated permits/approvals.	Consultant (Environmental Inspector)
R16	Redside Dace Habitat	Culvert/Bridge replacement or extensions and other in- and near-water work have the potential to harm Redside Dace or their habitat. Regulated habitat for Redside Dace is present within the study area.	• An Aquatic Habitat Assessment will be prepared prior to construction to outline specific mitigation related to fish habitat loss and/or disturbance. • Construction activities will occur in accordance with the Guidance for Development Activities in Redside Dace Protected Habitat (MNRF, 2016b).	Consultant (Detailed Design)/Contractor	All in-water and near-water works in and around Redside Dace Habitat will be conducted in accordance with the ESA, 2007. Thus, no net effects are anticipated.	An Environmental Inspector will conduct regular inspections to confirm that all work is conducted in accordance with the ESA, 2007, and any associated permits/approvals.	Consultant (Environmental Inspector)
R17	Wellhead Protection Areas	Though there are a number of WHPAs present along the rail corridor, 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	• Prior to Project 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.	Consultant (Detailed Design)/Contractor	No net effects are anticipated.	An Environmental Inspector will conduct regular inspections, to confirm that the Hazardous Materials and Fuel Handling Plan is followed.	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		equipment or other construction activities. This can affect groundwater quality.					
R18	Tree Removal	Trees present within the proposed development envelope will require removal. The approximate removals based on field investigations are as follows: Phase One: Track Infrastructure: Total Existing ROW Tree Removal: 2,141 Total Proposed ROW Tree Removal: 585 Future Phase(s): Total Existing ROW Tree Removal: 1,839 Total Proposed ROW Tree Removal: 2,123 Impacts to trees adjacent to the work zone may result in unintended root damage or tree felling.	• Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects.	Metrolinx/ Contractor	Reduced on-site tree canopy but overall increase in number of trees in landscape through off-site planting.	Monitor success and tend to new plantings in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.	Contractor/ Consultant (Environmental Inspector) Complete a post-construction assessment of trees.
			• An assessment of trees within and on lands immediately adjacent to ROW to be completed prior to construction to determine required setbacks and protection measures.	Consultant (Detailed Design - Certified Arborist)	No net effects are anticipated.	Conduct a post-construction assessment of trees to determine if injuries to the preserved trees have occurred or their health and/or structure has deteriorated. If deterioration or injury has occurred, identify and implement any necessary pruning, mitigation or removal of trees by a Certified Arborist.	Consultant (Certified Arborist)
			• TPZs to be implemented on retained trees through construction of barriers.	Contractor/ Consultant (Environmental Inspector)	No net effects are anticipated.	Monitor construction for unauthorized encroachment into vegetated areas and TPZs. Monitor silt fencing and/or tree protection barriers to confirm proper installation and functionality.	Consultant (Environmental Inspector)
			• Inspect and assess for hazardous limbs and trees for removal prior to commencement of use of the second track.	Consultant (Certified Arborist)	No net effects are anticipated.	Inspections will identify dead trees or limbs adjacent to ROW.	Consultant (Certified Arborist)
R19	Butternut tree – damage to habitat or removal of tree	Removal of forest habitat within 50 metres of Butternut tree or working within 25 metres of a Butternut tree within the rail corridor.	• Register habitat damage or tree removal and submit BHA to the MNRF.	Consultant (Environmental Inspector - Certified Butternut Health Assessor)	Overall net increase in Butternut canker resistant trees.	Butternut tree monitoring as determined by the MNRF and Metrolinx.	Consultant (Environmental Inspector - Certified Butternut Health Assessor)
			• Preparation of a Butternut Compensation Planting Plan.	Metrolinx/ Landscape Architect			

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
Natural Environment – Operations and Maintenance							
R20	Significant Natural Areas, Wildlife Habitat and Species at Risk	Significant maintenance activities requiring upgrades or replacement of major infrastructure components could require earth-moving or in-water works similar to activities described in the construction phase and in these instances the same type of effects could also be experienced.	• Any major maintenance work that would result in the replacement or upgrade of major infrastructure components requiring earth-moving or in-water work will be conducted in accordance with the applicable mitigation listed under the construction phase. • Any required permitting or authorizations will be obtained, as required.	Metrolinx/Contractor (Maintenance)	With implementation of the recommended mitigation measures, no net effects are anticipated.	Monitoring will be undertaken subject to the scale of the maintenance work. Monitoring similar to that required during the construction phase may be required for large-scale maintenance and replacement work.	Metrolinx/ Contractor (Maintenance)
R21	Significant Natural Areas, Wildlife Habitat and Species at Risk	Trees adjacent to the ROW may need to be trimmed and cleared with the potential to harm healthy trees. Any use of chemical pesticides to maintain the ROW also has the potential to affect groundwater and adjacent natural features if not applied correctly.	• Any herbicide applications to clear vegetation within the 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.	Metrolinx/Contractor (Maintenance)	Vegetation trimming is not expected to have any significant effects. Thus, no net effects are anticipated.	Contractors and rail staff are responsible for monitoring the effects of trimming and herbicide application. Any significant concerns will be reported to superiors for timely resolution.	Metrolinx/ Contractor (Maintenance)
R22	Significant Natural Areas, Wildlife Habitat and Species at Risk	Spills of fuel and other hazardous materials could occur as a result of maintenance activities and could potentially affect ground and surface water quality and kill or harm vegetation and wildlife.	• An Emergency Response and Communications Plan will be developed and followed throughout the operations and maintenance phase (includes spill response plans). • Metrolinx will develop spill prevention and contingency plans for the ROW. 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.	Metrolinx/Contractor (Maintenance)	Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.	Track inspectors and maintenance contractors are responsible for reporting spills and other issues and ensuring their timely resolution.	Metrolinx/ Contractor (Maintenance)

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			• Spills or depositions into watercourses or 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.				
R23	Wildlife Habitat, Species at Risk and Nests of Migratory Birds	Minor disturbance to sensitive wildlife species due to increased train frequency, noise and activity increases along the corridor. Given the existing (ambient) conditions, any increase in train noise and activity is likely to have a minimal effect.	• Environmental noise will be reduced to the extent possible through standard operating practices such as regular train maintenance and limiting whistling in accordance with all safety protocols and requirements.	Metrolinx	There may be a minor reduction in the use of adjacent habitats due to increased environmental noise. However, due to the existing noise, the change is likely to be minimal. The net effect is expected to be minor and localized.	No monitoring activities are required.	Not applicable.
R24	Linkage Areas and Deer Wintering/Yarding Areas	Wildlife mortality as a result of wildlife/train collisions. Exclusion fencing designed to keep wildlife out of the ROW can trap wildlife in the corridor if they inadvertently enter through a road crossing or other gap in the fencing. Effect most likely to occur where wildlife are attempting to cross the corridor at the Linkages Areas and Deer Wintering and Yarding Areas.	• Wildlife exclusion fencing will be erected along the boundaries of the Linkages Areas. This fencing will be designed to exclude small and mid-sized mammals, reptiles and amphibians from the ROW and direct them to nearby ecopassages. • Additional exclusion fencing will be installed adjacent to the two Deer Wintering Areas and will be designed to exclude deer from the ROW. Escape features will be incorporated to assist deer that may inadvertently become trapped in the ROW. • Exclusion fencing and escape features will be developed prior to construction and will be designed in consultation with the TRCA/LSRCA and the MNRF. • Passage structures that accommodate movement of wildlife will be incorporated into the detailed design of associated culverts or bridges located at the nine Linkage Areas where passage is currently limited.	Metrolinx/Consultant (Detailed Design)/Contractor	Some mortality due to wildlife/train collisions is expected but net effects are likely to be minimal with no significant effects on species at the population level. Fencing along the full length of the corridor will create an overall loss of connectivity. With the proposed passage structures, the barrier effect is expected to be minimized.	The following monitoring will be undertaken: Wildlife passages will be monitored for two years to confirm that they are functioning appropriately. Exclusion fencing will be monitored for two years to confirm that that it is functioning appropriately. Regularly ongoing inspections will be conducted to confirm all structures are in good working order.	Metrolinx/ Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• Passages will be designed to allow for the movements of small and mid-sized mammals, reptiles and amphibians. • The TRCA and LSRCA will continue to be consulted on all design details.				
R25	Tree Removal	Deterioration of trees' vitality that are adjacent to the expanded rail corridor over time.	• Pruning or removal of trees to prevent woody material from falling on the corridor. • Tree replacement may be required to compensate owner of tree.	Metrolinx Consultant (Certified Arborist) Metrolinx	Tree canopy is reduced until compensation plantings can replace or enhance canopy coverage, as required.	Inspect and assess trees on adjacent lands annually (at minimum).	Metrolinx Consultant (Certified Arborist)
Cultural Environment - Construction							
R29	Areas of Archaeological Potential	Land-disturbing construction activities have the potential to impact archaeological resources in areas of archaeological potential identified on Figures 32 to 53 in the Stage 1 Archaeological Assessment in Appendix C.	• A Stage 2 Archaeological Assessment will be required prior to construction in the affected areas determined to have archaeological potential. • The Stage 2 Archaeological Assessment will involve a pedestrian or test pit survey to further define areas of archaeological potential and determine whether further studies or mitigation measures are required. • Further studies (e.g., Stage 2, Stage 3, Stage 4) and associated mitigation measures will be implemented where required in accordance with the recommendations made by the licenced consultant archaeologist. • If prior to construction it is confirmed that the BRCE Project extends beyond the currently identified study area, then further Stage 1 Archaeological Assessment will be conducted to determine the archaeological potential of the affected lands. • In the event that previously undocumented archaeological remains are found during construction activities, the proponent or person discovering the archaeological resources will cease alteration of the site immediately, and the consultant archaeologist, approval authority, and	Metrolinx/Licensed Consultant Archaeologist	Upon implementation of the mitigation and monitoring measures recommended for the BRCE Project by the Licensed Consultant Archaeologist, no net effects related to archaeological resources are anticipated.	The Consultant (Environmental Inspector) shall monitor land-disturbing construction activities to confirm they remain within the study area subject to the archaeological assessment(s). Any site personnel responsible for carrying out or overseeing land-disturbing construction activities shall be informed of their responsibilities in the event that an archaeological resource is encountered.	Consultant (Environmental Inspector)/ Contractor/ Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			the Cultural Programs Unit of the MTCS will be immediately notified. • In the event that human remains are discovered, the person discovering the human remains will also immediately notify the police or coroner.				
R30	Known or Potential Cemeteries	Land-disturbing construction activities have the potential to impact archaeological resources associated with known or potential cemeteries, including: • St. Helens Historic Church. • Mt. Sinai Memorial Park. • Maple United Church Cemetery. • Lefroy United Church. St. Paul's Cemetery.	• A Stage 2 Archaeological Assessment that also includes archival research on properties with known or potentially containing cemeteries is recommended. • Lands within 10 metres of known cemeteries require completion of a Cemetery Investigation prior to any proposed ground disturbance through construction of the Project. • A Stage 3 Cemetery Investigation, if required, will be completed by a licenced consultant archaeologist. If human remains are confirmed to be present, then local law enforcement and the Office of the Chief Coroner for Ontario will be immediately notified to review the discoveries and confirm that the site is not of forensic interest. Non-forensic findings will be subsequently communicated to the Cemeteries Registrar. Any documented human remains will be subjected to protection and avoidance by effects proposed by the BRCE Project. • Known cemeteries require protection and avoidance from any BRCE Project effects, including a temporary barrier to be erected around the known extent of the cemetery and "no go" instructions issued for all on-site crews as a precautionary measure. • In the event that archaeological resources are found during land clearing all work in the affected area will cease and MTCS will be contacted.	Metrolinx/licenced consultant archaeologist/ Contractor	Upon implementation of the mitigation and monitoring measures recommended for the BRCE Project by the licenced consultant archaeologist, no net effects related to archaeological resources are anticipated.	Archaeological monitoring will be conducted by a licenced consultant archaeologist as recommended in the associated Stage 2, Stage 3, and/or potential Stage 4 studies.	Licenced consultant archaeologist

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R31	PHPs	Construction activities for the construction of rail infrastructure could directly impact the heritage attributes of two PHPs: • St. Clair Avenue West Bridge (Mile 5.24) • Stone Box Culvert - 1 (Mile 20.86)	• HIAs/Strategic Conservation Plans will be completed in accordance with the Standards and Guidelines prior to construction. The HIAs will be developed in consultation with and submitted for review to MTCS and other heritage stakeholders (municipal planners and municipal heritage committee). The HIAs will discuss the alternatives considered, and that all other alternatives to the alterations to these structures have been considered and the best alternative has been adopted. The HIAs will also make recommendations to minimize or mitigate adverse effects on the property resulting from the removal and demolition.	Metrolinx/Qualified Heritage Consultant	Impacts to CHRs at these affected properties will be appropriately mitigated or avoided as much as possible through implementation of the recommendations outlined in the HIAs.	Monitoring activities will be in accordance with the HIAs.	To be determined through HIAs.
R32	CHPs and Adjacent Properties	Construction activities for the construction of rail infrastructure could indirectly impact the heritage attributes of several CHRs; CHPs with previous heritage recognition: • Downsview Park and Airport, Listed, City of Toronto and the Federal Heritage Buildings Review Office (FHBRO) (Mile 10.00); • Farmscape-1, Listed, City of Vaughan (Mile 20.32); • Golf Range, Listed, City of Vaughan (Mile 20.76); • Farmscape-2, Property of interest by municipality, City of Vaughan (Mile 20.84); • Farmscape-5, Listed, City of Vaughan (Mile 21.63); and	As summarized in Table 4-5, mitigation will include one or more of the following: • Undertake consultation with heritage staff at the respective municipality to review the detailed design for the BRCE works, once available, and determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, an HIA will be completed during detailed design or prior to Project construction to confirm that impacts of heritage resources are appropriately mitigated. • Potential effects on adjacent CHRs due to increased vibration will be assessed during detailed design in accordance with the Noise and Vibration Impact Assessment provided in Appendix H of this EPR and the *Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects* (Wilson, Ihrig & Associates Inc., et. al., 2012).	Metrolinx/Qualified Heritage Consultant	Impacts to CHRs will be appropriately mitigated or avoided as much as possible through implementation of the mitigation measures to be identified in the recommended HIAs and/or mitigation carried out in accordance with other components of this study (e.g., vibration and tree removal mitigation).	Monitoring activities will be in accordance with HIAs and/or components of this study (e.g., vibration and tree removal monitoring).	To be determined through HIAs and/or components of this study (e.g., vibration and tree removal monitoring).

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		• Sawyer/Cortelucci House, Designated Part IV OHA (Mile 53.90). Adjacent properties: • National Cash Register Company Factory, Designated, Part IV OHA (Mile 3.20); • Maple Village Heritage Conservation District (HCD), Designated Part V OHA (Mile 18.10-18.30); • Crawford and Maud Wells House, Designated Part IV OHA (Mile 23.20); • Thomas Jaffrey Robertson House, Designated, Part IV OHA (Mile 33.90); and • Former Newmarket Train Station, Designated, Part IV OHA (Mile 34.35).	• Municipal heritage staff, and PDP as applicable, will be consulted regarding the visual aesthetics of the noise walls. • Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER projects, described in the Tree Inventory Plan and Arborist Report found in Appendix B of this EPR.				

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
Cultural Environment – Operations and Maintenance							
R32	Archaeological Resources Lands Within BRCE Rail Corridor	Upon completion of construction, no potential effects related to archaeological resources are anticipated.	• No mitigation measures are required.	Not applicable.	No net effects anticipated.	No monitoring activities are required.	Not applicable.
R33	Cultural Heritage Resources Lands Within BRCE Rail Corridor	Upon completion of construction and implementation of the corresponding recommended mitigation measures, no potential effects to CHRs are anticipated.	• No mitigation measures are required.	Not applicable.	No net effects anticipated.	No monitoring activities are required.	Not applicable.
Social and Built Environment – – Pre-Construction Land Clearing/Property Acquisition							
R34	Residential, Commercial and Industrial Land Uses	Acquisition of lands with private residences and businesses: Acquisition of six full and 105 partial residential, commercial and industrial properties resulting in: Decrease in 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 affected residential and other property types. Loss of customer parking or reduced delivery areas on affected commercial and industrial lands.	• Confirm specific property requirements prior to construction to determine predicted property impacts. • Engage and negotiate with affected property owners regarding land acquisition and easements required for the proposed works. • Provide fair market value compensation to affected property owners in accordance with applicable laws.	Metrolinx/Consultant (Detailed Design)	The effects to properties will be mitigated by providing fair market value compensation in accordance with applicable laws and through negotiations with affected property owners. Net effects are expected to be minimal (insignificant).	No monitoring activities are required.	Not applicable.
R35	Residential, Commercial and Industrial Land Uses	Encroachments into the existing ROW:	• All landowners with a structure (e.g., building, fence, garden, parking area etc.) encroaching onto the existing ROW will be notified by mail that	Metrolinx	No net effects are anticipated.	No monitoring activities are required.	Not applicable.

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		Removal of structures on 71 properties that have encroached into the existing ROW, including: portions of buildings; fencing; backyard areas; storage areas; pavement.	structures will need to be removed by the property owner. • Metrolinx will engage with affected landowners prior to construction.				
R36	Institutional Lands	Acquisition of 0.51 ha of lands supporting community services: Partial acquisition of a number of schools, places of worship, government offices, daycare facilities, libraries or other community services facilities.	• Confirm specific property requirements prior to construction to determine predicted property impacts. • Engage and negotiate with affected property owners regarding land acquisition required for the proposed works. • Provide fair market value compensation to affected property owners in accordance with applicable laws.	Metrolinx Consultant (Detailed Design)	No net effects are anticipated.	No monitoring activities are required.	Not applicable.
R37	Agricultural Lands	Acquisition of lands providing economic resources: A total of 9.62 ha of agricultural lands will be acquired. The amount is minor on each property and is expected to result in a minimal or negligible reduction in productivity, yields and income for farm owners. No loss to any lands within the Specialty Crop Area associated with the Holland Marsh, Potential to disrupt farm infrastructure, including fencing, tile drainage and irrigation systems. The presence of this infrastructure has	• Confirm specific property requirements prior to construction to determine predicted property impacts. • Engage and negotiate with affected property owners regarding land acquisition and easements required for the proposed works and to identify any potential impacts to farm infrastructure such as livestock fencing, irrigation systems and tile drainage. • Provide fair market value compensation to affected property owners in accordance with applicable laws. • Mitigation measures will be developed in consultation with individual owners.	Metrolinx/Consultant (Detailed Design)	The effects to agricultural lands will be mitigated by providing fair market value compensation in accordance with applicable laws and through negotiations with affected property owners, Net effects are expected to be insignificant.	No monitoring activities are required.	Not applicable.

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		not been confirmed and the extent of impacts is unknown.					
R38	Aggregate Resource Areas	Acquisition of lands providing economic resources: Loss of access to 0.99 ha of aggregate resource lands in the Lefroy-Belle Ewart area. The value of this resource appears to be minor and therefore the effect of the BRCE Project is negligible.	• No mitigation is required. • Continue to consult with the Town of Innisfil and throughout detailed design and prior to construction.	Metrolinx	No net effects are anticipated.	No monitoring activities are required.	Not applicable.
R39	Recreational and Open Space Lands (Parks and Trails)	Acquisition of community amenity areas (Parks and Trails): Acquisition of 6.45 ha of recreational and open space lands, Minor park structures may be affected, including fencing, drainage, parking and entrance areas.	• Mitigation measures will be developed in consultation with individual owners, as required.	Metrolinx	No net effects are anticipated.	No monitoring activities are required.	Not applicable.
R40	Federal Lands	Acquisition of 0.06 ha of federally-owned lands in Downsview Park.	• Acquisition will be coordinated through CLCL/PDP in accordance with all federal requirements.	Metrolinx	No net effects are anticipated.	No monitoring activities are required.	Not applicable.
R41	Future Growth Areas	Acquisition of lands within Growth Areas and lands subject to pending development applications: Community Growth Targets: property acquisitions are not likely to significantly affect future growth targets or development potential. Effects are likely to be minimal; however municipalities will continue to be consulted prior to construction, Partial acquisition of lands subject to pending development applications.	• Continue to consult with municipalities prior to construction. • Confirm specific property requirements prior to construction to determine predicted property impacts. • Engage and negotiate with affected property owners regarding land acquisition and easements required for the proposed works. • Provide fair market value compensation to affected property owners in accordance with applicable laws.	Metrolinx/Consultant (Detailed Design)	No net effects are anticipated.	No monitoring activities are required.	Not applicable.

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
Social and Built Environment – Construction							
R42	All Land Uses	Temporary nuisance effects due to increased noise, vibration, and dust which has the potential to affect the enjoyment of property in affected residential, commercial, institutional, recreational and other sensitive land use areas.	• 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. • Construction schedule delays will be avoided to the extent possible in order to minimize construction duration. • All stockpiled materials will be fenced and the construction footprint area will be minimized to prevent the construction zone extending beyond that which is necessary.	Contractor	The temporary nuisance effects during construction will be minimized to the extent practical. As such, net effects are predicted to be insignificant.	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.	Consultant (Environmental Inspector)
R43	All Land Uses	Temporary visual effects to residences, businesses, institutions, parks and other land uses caused by temporary storage sites for equipment, staging/laydown areas, stockpiling of materials, etc.	• Construction schedule delays will be avoided to the extent possible to minimize the duration of construction and corresponding visual impacts. • All stockpiled materials will be fenced, and the construction footprint area minimized to prevent the construction zone extending beyond that which is necessary.	Contractor	The temporary visual effects will be minimized to the extent practical. As such, net effects are predicted to be insignificant.	Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with 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.	Consultant (Environmental Inspector)
R44	All Land Uses	Longer term visual effects resulting from the removal of trees that currently provide a visual buffer from the corridor.	• Metrolinx will coordinate tree removal compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects, as documented in the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR. • Where appropriate, Metrolinx will seek to develop an aesthetically pleasing design for public-facing	Metrolinx/Consultant (Detailed Design)/Contractor	Reduced on-site tree canopy but overall increase in number of trees in landscape through off-site planting.	Monitor success and tend to new plantings in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.	Contractor / Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			retaining walls or other appropriate project infrastructure in consultation with municipalities/adjacent landowners.				
R45	All Land Uses	Temporary encroachment on adjacent lands for construction purposes (e.g., access, establishment of equipment storage/laydown areas, stockpiling of materials, etc.) through the use of construction easements or TLIs.	• A review will be completed prior to construction phase to identify temporary easements for construction or other purposes, and permanent property acquisition requirements to accommodate the BRCE Project work. Construction will be planned to limit the need for construction easements to the extent possible. • Metrolinx will engage and negotiate with affected land owners regarding easements required.	Metrolinx/Consultant (Detailed Design)	The effects due to temporary encroachment on adjacent lands will be minimized to the extent practical. As such, net effects are predicted to be insignificant.	Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with plans and within specified construction 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.	Consultant (Environmental Inspector)
R46	Transit Riders	Temporary inconvenience (e.g., occasional service constraints and delays) to transit riders due to construction.	• Construction activities will be scheduled and staged to avoid impacts to existing train schedules to the extent possible. • If the need for a closure arises, GO buses will be available to take transit users to the next available station.	Metrolinx/Consultant (Detailed Design)	The temporary effects to transit riders during construction will be minimized to the extent practical. As such, net effects are predicted to be insignificant.	Construction activities will be monitored by a qualified Environmental Inspector.	Consultant (Environmental Inspector)
R47	Vehicle, Pedestrian, Cyclist and Agricultural Traffic	Temporary access restrictions to affected residences, parks, trails businesses, institutions, sidewalks, bike lanes, and farm crossings due to road and trail closures, and lane restrictions.	• Determine adequate construction hauling routes in consultation with municipalities. • Prepare site-specific Traffic Control and Management Plans prior to construction and implement during 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.	Consultant (Detailed Design)/ Metrolinx	The temporary restrictions to access points will be minimized to the extent practical. As such, net effects are predicted to be insignificant.	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.	Consultant (Environmental Inspector)
R48	Air Quality of	Fugitive dust emissions resulting from: Soil excavation and filling activities,	• Dust suppression measures as needed to control fugitive dust emissions in accordance with the Cheminfo Services Inc. March 2005 publication	Contractor	Potential air quality effects are expected to be temporary and localized to	Environmental Inspector to frequently check the effectiveness of mitigation measures and construction BMPs to confirm they	Consultant (Environmental

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
	Lands Adjacent to the Rail Infrastructure	Demolition of structures, Stockpiling of soil and other friable construction materials, Transportation of friable fill materials via dump trucks, Emissions resulting from the combustion engines of construction equipment.	"Best Practices for the Reduction of Air Emissions From Construction and Demolition Activities". • Stockpiling of soil and other friable materials in locations that are less exposed to wind. • Use of dump trucks with retractable covers for the transport of friable fill materials. • Use of deconstruction methods in lieu of demolition where feasible. • Minimized drop heights and use of enclosed chutes and cover bins for debris associated with deconstruction of affected structures. • Washing of equipment and/or use of mud mats where practical at construction site exits to limit the migration of soil and dust off-site. • Use of ESC measures such as silt fence and erosion control blankets to address areas with temporary unstabilized soil. • Permanent stabilization of exposed soil areas with non-erodible material (e.g., stone or vegetation) as soon as practicably possible after construction in the affected area is complete. • Ensuring that all construction vehicles, machinery, and equipment is equipped with current emission controls, and in a state of good repair.		the areas adjacent to the corridor, Effects reduced through implementation of construction BMPs.	are functioning as intended. In the event that mitigation is found to not be effective, the Contractor will be notified to implement revised mitigation measures designed to improve 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 make adjustments 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, The Contractor will establish a complaint response protocol for nuisance effects such as dust.	Inspector) and Contractor
R49	Acoustic Environment of Lands Adjacent to the Rail Infrastructure	Potential effects will be generally limited to the lands adjacent to the Barrie rail corridor, and may be a short term nuisance to affected building occupants from the following activities: Excavation, grading and placement of fill, Retaining Wall Installation,	• Construction BMPs will be utilized to minimize any adverse effects from construction noise at nearby sensitive receptors. These practices include, but are not limited to: • Complying with local noise by-laws related to construction activities as best possible. • Deconstruction procedures in lieu of demolition of affected existing structures wherever feasible.	Contractor/Metrolinx	Building occupants adjacent to the rail infrastructure construction will be temporarily subjected to increased noise levels from construction activities, Temporary noise impacts from construction activities will be minimized through	Construction activities shall be monitored by a qualified Environmental Inspector who will frequently checked and confirm the effectiveness of the BMPs being implemented. In the event that mitigation is found to not be effective, the Contractor shall be notified to implement revised mitigation measures designed to improve effectiveness,	Consultant (Environmental Inspector) and Contractor

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		Bridge Construction, Track installation.	• Operation of equipment with correctly installed and maintained sound attenuating devices. • Using 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, and wherever pile driving is necessary, use methods that minimize noise (e.g., pre-drilling, switching impact with vibratory hammer, using augured cast-in-place piles, drilled shafts, 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. • 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.		application of applicable construction BMPs.	The Contractor will prepare and implement a complaints protocol for receiving, investigating and addressing construction noise complaints from the public during construction of the proposed rail infrastructure. The protocol will include a plan for how the public is to be notified of their options for lodging a complaint. The Contractor will install monitoring equipment, as required, to measure and document noise levels at various points to provide empirical data for the assessment of complaints.	
R50	Vibrational Environment of Lands Adjacent to the Rail Infrastructure	Nuisance to adjacent building occupants resulting from construction activities causing vibrations, typically involving: Demolition of existing structures, Breaking of asphalt and concrete through the use of hydraulic hammers or jack hammers, Soil excavation, grading, compaction, and pile driving, Potential damage to adjacent property or infrastructure.	• Implement construction BMPs including but not limited to the following: • Deconstruction procedures in lieu of demolition of affected existing structures wherever feasible. • Refraining from the use of blasting. • Using saws to break up existing asphalt and concrete instead of hydraulic hammers or jack hammers, wherever possible and practical. • Using soil compaction techniques that minimize the need for dynamic compaction, or wherever dynamic compaction is necessary, making adjustments to minimize vibrations (e.g., using smaller falling weights).	Contractor/Metrolinx	Adjacent building occupants may temporarily be subjected to increased vibration levels from construction activities, No damage to neighbouring property or infrastructure is anticipated.	Environmental Inspector to check the effectiveness of construction BMPs to confirm they are functioning as intended. In the event that mitigation is found to not be effective, the Contractor will be notified to implement revised mitigation measures designed to improve effectiveness, In the event that the Contractor or Environmental Inspector notices or is made aware of property or infrastructure damage caused by construction vibration, the Contractor will immediately stop	Consultant (Environmental Inspector) and Contractor

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• Wherever feasible, design foundations for infrastructure that minimizes the need or extent of pile driving, and wherever pile driving is necessary, use methods that minimize vibrations (e.g., pre-drilling, switching impact with vibratory hammer, using augured cast-in-place piles, drilled shafts, etc.). • 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 vibration effects.			work in the area. The Contractor will develop a restoration plan in consultation with the property or infrastructure owner, and will complete the work using alternative methods to prevent further damage, The Contractor will establish a complaints response protocol for vibration effects.	
R51	Existing Grade Separated Crossings at Major Mackenzie Drive (Mile 18.10), Yonge Street (Mile 28.50) and Coxmill Road (Mile 61.14)	Potential temporary lane closures and/or road closures to facilitate construction where existing grade separations need to be widened, resulting in increased congestion on adjacent road network and decreased access to adjacent lands and businesses.	• Coordinate work with municipalities carrying out other planned road projects. • Provide advance notification of works to municipalities, transit companies, emergency service providers and the general public, and consult with affected parties where required. • Encourage travel via alternate modes during construction phase. • Determine adequate construction hauling routes in consultation with municipalities. • Prepare site-specific Traffic Control and Management Plans prior to construction for implementation during construction. • Maintain reasonable access through work zone, as much as possible. • Provide wayfinding signage and travel time alert signage through work zone. • Maintain pedestrian/cyclist access through work zone. • Alter work periods/times to minimize disruption during Peak Periods.	Metrolinx/ Consultant (Detailed Design)/ Contractor	Potential temporary traffic delays due to lane reductions, Potential for traffic diversion along alternate routes during construction may result in temporary increase in traffic along alternate routes.	Confirm that construction of the grade separation expansions follow detailed design drawings, Construction inspection to monitor that work is performed in accordance with the site-specific Traffic Control and Management Plans.	Contractor/ Consultant (Environmental (Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• Adjust traffic controls during construction to respond to traffic conditions.				
R52	At-Grade Road/Rail Crossings	Potential temporary lane closures and/or traffic detours to facilitate construction may result in increased congestion on adjacent road network and decreased access to adjacent lands and businesses.	• Same mitigation as noted above for "Existing Grade Separated Crossings".	Same responsibilities as noted above for Existing Grade Separated Crossings.	Potential for traffic diversion along alternate routes during construction may result in temporary increase in traffic along alternate routes.	Same monitoring activities as noted above for Existing Grade Separated Crossings.	Same responsibilities as noted above for Existing Grade Separated Crossings.
R53	At-Grade Private Crossings at Mile 11.90, Mile 41.02 and Mile 41.25	Access through crossing may be restricted during construction of expanded crossing.	• Consult and coordinate construction with private owner of crossing.	Metrolinx	Periods of restricted access are anticipated during construction.	No monitoring activities are required.	Not applicable.
R54	At-Grade Rail/Rail Crossing at Mile 4.60	This crossing is planned to be grade separated in accordance with the Davenport Diamond Grade Separation EPR (May 2016).	• Mitigation measures to be undertaken in accordance with the Davenport Diamond Grade Separation EPR (May 2016).	Metrolinx	Refer to the Davenport Grade Separation EPR (May 2016) for details.	Monitoring will be undertaken in accordance with the Davenport Diamond Grade Separation EPR (May 2016).	Metrolinx
R55	At-Grade Active Transportation (Pedestrian/Cyclist) Crossings	Temporary disruption to trail operations during construction of additional track at active transportation crossings.	• Coordinate with affected municipalities/trail authorities to minimize the time for interruption of trail operations and/or provide alternate linkages during construction. • Implement a public notification plan to detail trail closures or modifications.	Metrolinx	The temporary disruption to trail operations during construction will be minimized.	Construction inspection to monitor site-specific Traffic Control and Management Plans and confirm that temporary trail closures and detours are adequately signed and sufficient notice is provided to the public.	Consultant (Environmental Inspector)
R56	At-Grade Farm Crossings	Temporary restriction of access through the crossing during construction of the expanded crossing.	• Consult and coordinate construction with the private owner of the crossing.	Metrolinx	No traffic-related net effects are anticipated.	No monitoring activities are required.	Not applicable.

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R57	Existing utilities/municipal infrastructure within the Barrie rail corridor ROW.	Preliminary investigation of the existing crossing agreements provided by Metrolinx identified 1,522 utility/infrastructure crossings over the Barrie rail corridor. The following number of existing utility crossings along the Barrie rail corridor may be affected by the rail infrastructure works. Phase One: City of Toronto 291 City of Vaughan 289 Township of King 99 Town of Aurora 199 Future Phase(s): Township of King 53 Town of Newmarket 237 Town of East Gwillimbury 107 Town of Bradford West Gwillimbury 99 Town of Innisfil 123 City of Barrie 25 There is also potential for TTC and other transit authority infrastructure and utilities to be affected.	• Mitigation measures will be further reviewed prior to the construction phase for known utility crossings and utilities running along the corridor in coordination with the utility owner. The following mitigation measures will be considered prior to the construction phase and implemented by the Contractor: • Protect the utilities/infrastructure left in place through barriers and other methods while construction occurs around them. • Relocation/remove utilities/infrastructure around the area of construction as required. • Any plans for protection or relocation of utilities/infrastructure will be submitted to the applicable utility/infrastructure owner for review, acceptance and coordination prior to construction.	Consultant (Detailed Design)/ Contractor	No net effects anticipated.	To be in accordance with the utility/infrastructure owner's protocols.	Contractor/ Consultant (Construction Inspection)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
Social and Built Environment – Operations and Maintenance							
R58	All Land Uses	Potential for nuisance effects (e.g., noise, vibration, dust, diminished air quality, and train whistling) from an increased number and frequency of passing trains to sensitive institutional uses such as places of worship, funeral homes, cemeteries, daycares, and schools adjacent to the corridor.	• Implement mitigation measures related to noise, vibration and diminished air quality as described in the Air Quality Study and the Noise and Vibration Impact Assessment, provided in Appendices G and H, respectively. • The use of electric trains on this corridor in the future will reduce air quality effects. • Further mitigation to reduce noise effects will be developed as part of detailed design, as required, based on noise modelling and projections. • GO Train operations will be carried out in accordance with applicable regulations and standards.	Metrolinx	The nuisance effects during operations will be mitigated through compliance with regulatory requirements and identified noise, vibration and air quality mitigation measures. In addition, the nuisance effects related to diminished air quality will be offset by reduced road traffic emissions.	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.	Metrolinx
R59	Parks, Trail Crossings, Institutional Lands	Safety concerns where children and the general public play, cross or spend time within proximity of the ROW, Safety concerns at the Country Day School which includes a recreation field bisected by the Barrie rail corridor.	• The entire rail corridor will be appropriately fenced to limit access. • The adequacy of safety structures at all road and trail crossings is being studied by Metrolinx and any deficiencies will be addressed during construction. • Ongoing consultations with the Country Day School will continue throughout the detailed design and prior to construction in order to address access concerns. Field access through the existing level crossing will be maintained.	Metrolinx/Consultant (Detailed Design)	No negative net effects are anticipated. Positive net effects are expected. Safety will be improved due to the installation of fencing in areas where there is currently no fencing. No net effects on school operations at the Country Day School are anticipated.	Metrolinx will continue its ongoing inspection program to monitor the effectiveness of its GO Transit operations. An existing complaints procedure is in place to address any concerns raised by neighbouring land owners, municipalities and/or the public.	Metrolinx
R60	Future Trails Proposed within the ROW	Reduced space within the existing ROW to accommodate future trails that are currently shown in OP documents.	• Metrolinx respects the importance of park lands to communities. • Metrolinx also supports municipal initiatives to promote active transportation and has discussed trail connections with municipalities throughout the BRCE TPAP. • The feasibility of trails within or adjacent to the ROW will be determined on a site specific basis.	Metrolinx	Potential fragmentation of trails if impacts cannot be mitigated prior to construction.	No monitoring activities are required.	Not applicable.

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
R61	Air Quality of Lands Adjacent to the Rail Infrastructure	No effects anticipated from operations or maintenance activities.	• Mitigation is generally not required as operations and maintenance will be carried out in accordance with applicable regulations and standards, including Ontario's AAQC (PIBS#6570e01) (MOECC, 2012).	Metrolinx	No net effects are anticipated.	Metrolinx and GO Transit have ongoing inspection schedules to monitor the effectiveness of their operations. An existing complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.	Metrolinx
R62	Acoustic Environment of Lands Adjacent to the Rail Infrastructure	Future, Scenario 1: 70 of 162 receptors have been identified in this EPR where modelled noise impacts are anticipated to be greater than thresholds as identified in the MOECC/GO Draft Protocol. Future, Scenario 2: 132 of 162 receptors have been identified in this EPR where modelled noise impacts are anticipated to be greater than thresholds as identified in the MOECC/GO Draft Protocol.	• Applicable mitigation measures were assessed for the 68 and 131 sensitive receptors identified in Future, Scenarios 1 and 2, respectively, that were modelled to have significant or very significant Adjusted Noise Impacts. • The model assessed 68 and 122 noise barrier groupings, for Future, Scenarios 1 and 2, and found that 30 and 52 noise barrier groupings were technically feasible. • A total of 19,000 metres of new or modifications to existing/planned noise barriers are proposed for Future, Scenario 1. • For Future, Scenario 2, a total of 36,800 metres of new or modifications to existing/planned noise barriers are proposed.	Detailed Design Consultant	No impacts or mitigation measures are required at 94 and 31 of the 162 sensitive receptors for Future, Scenarios 1 and 2, respectively. No net effect expected at 33 and 59 of the 162 sensitive receptors, for Future, Scenarios 1 and 2, respectively where noise barriers are proposed. Net effect expected for remaining 35 and 72 sensitive receptors, for Future, Scenarios 1 and 2, respectively, where noise mitigation measures that may not be technically or economically feasible. Assessment to address this net effect will be conducted as part of detailed design.	Metrolinx and GO Transit have ongoing inspection schedules to monitor the effectiveness of its operations. A complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.	Metrolinx
R63	Vibrational Environment of Lands Adjacent to	The potential vibration effects exceed the acceptable ranges within the MOECC/GO Draft Protocol at six of the 96 assessed sensitive areas	• Mitigation measures such as ballast mats and trenches will be investigated prior to construction to reduce the vibration effect at the six identified sensitive areas and four new switch locations.	Detailed Design Consultant	Adjacent building occupants may experience more frequent vibration effects. Vibration effects	Metrolinx and GO Transit ongoing inspection schedules to monitor the effectiveness of their operations.	Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
	the Rail Infrastructure	and are expected to be noticeable at four of the 11 switch locations.			are generally expected to be within 0.14 mm/s, or less than 25% above the objective level, which is within the acceptable limits established in the MOECC/GO Draft Protocol, at the majority of locations.	An existing complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.	
R64	Existing Grade Separated Crossings at Major Mackenzie Drive (Mile 18.10), Yonge Street (Mile 28.50) and Coxmill Road (Mile 61.14)	No long term effects anticipated.	• No mitigation measures are required.	Not applicable.	No net effects are anticipated.	No monitoring activities are required.	Not applicable.
R65	At-Grade Road/Rail Crossings	As a result of the additional track and increased train volumes, there will be a greater exposure for motorists and pedestrians, thus increasing the potential for accidents, Increased potential for conflict between road and rail operations (congestion, queuing etc.), Changes to access/travel patterns in the immediate area of the crossing resulting from an increase in travel delays due to railway crossing operations.	• A detailed safety assessment will be prepared for each crossing and provide preliminary screening for improvement requirements. • Consideration of additional operational enhancements (e.g., signal pre-emption, pre-signals, etc.) is recommended prior to construction for crossings where potential traffic queuing issues may develop. • A further analysis of existing at-grade crossings will be conducted as part of a separate study (outside the scope of the BRCE TPAP), in consultation with municipalities, to determine which, if any, ought to be replaced with an underpass or overpass.	Consultant (Detailed Design)/ Metrolinx	Queuing and congestion will increase as vehicular volumes and train volumes increase. Long term travel patterns/access may be changed in the area of the at-grade crossing.	Monitor exposure index and safety at the crossings, and reassess warning system and protection requirements.	Metrolinx
R66	At-Grade Private Crossings at Mile 11.90, Mile 41.02 and Mile 41.25	Increased train volumes will result in additional delays to the vehicles travelling over the crossing. As a result of the additional track and increased train volumes, there will be a greater exposure for motorists and pedestrians, thus	• Notify private owners of rail operations to allow for coordination of crossing times. • Upgrade crossing warning systems to meet Transport Canada's Grade Crossing Standards, once warranted.	Metrolinx	The potential for accidents at crossings due to increased train volumes and additional track will be minimized.	Monitor exposure index and safety at crossings as service levels increase; reassess warning system requirements periodically.	Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		increasing the potential for accidents.					
R67	At-Grade Rail/Rail Crossings at Mile 4.60	This crossing is planned to be grade separated in accordance with the Davenport Diamond Grade Separation EPR (May 2016).	• Mitigation measures to be undertaken in accordance with the Davenport Diamond Grade Separation EPR (May 2016).	Metrolinx	Not Applicable	Monitoring will be undertaken in accordance with the Davenport Diamond Grade Separation EPR (May 2016).	Metrolinx
R68	At-Grade Active Transportation (Pedestrian/Cyclist) Crossings	As a result of the additional track and increased train volumes, there will be a greater exposure for pedestrians and cyclists, thus increasing the potential for accidents. Increased need for stations to have adequate pedestrian/cyclist access and linkage to broader networks.	• For proposed crossings, Metrolinx will work with affected municipalities to design crossings with adequate crossing warning systems, protection measures, or grade separations, taking into consideration the requirements of the BRCE Project. • Ensure that adequate pedestrian/cyclist connections are provided to access the stations. • Work collaboratively with municipalities/trail authorities to develop customized pedestrian policies and warrants for trails crossing or along the Barrie rail corridor. • Relocation requirements or upgrades of crossing warning systems, protection measures, or grade separations for existing active transportation crossings will be considered, in accordance with Transport Canada's Grade Crossing Standards prior to construction.	Metrolinx/ Consultant (Detailed Design)	The potential for accidents at crossings due to increased train volumes and additional track will be minimized.	Obtain further municipal input and identify environmental effects of potential future upgrade options. Identify the potential for screening tools at active transportation crossings to identify future upgrade requirements. Monitor safety of crossings as service levels increase.	Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
R69	At-Grade Farm Crossings	Increased train volumes will result in additional delays to the vehicles travelling over the crossing. As a result of the additional track and increased train volumes, there will be a greater exposure for farm vehicles and workers, thus increasing the potential for accidents.	• Notify private owner of rail operations to allow for coordination of crossing times. • Upgrade crossing warning systems to meet Transport Canada's Grade Crossing Standards, once warranted, and discuss the potential for closure of the crossing with the private owner of the crossing, if an alternate travel route exists.	Metrolinx	The potential for accidents at crossings due to increased train volumes and additional track will be minimized.	Monitor exposure index and safety at crossings as service levels increase. Reassess warning system requirements periodically. Reassess potential for closure if conditions change over time.	Metrolinx
R70	Existing utilities/municipal infrastructure within the Barrie rail corridor ROW.	No effects anticipated from operations or maintenance activities.	• No mitigation measures are required.	Not applicable.	No net effects anticipated.	No monitoring activities are required.	Not applicable.

Table 4-20: Impact Assessment, Mitigation Measures, Net Effects, and Monitoring Activities Summary Table – GO Station Improvements

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
Natural Environment – Pre-Construction Land Clearing/Property Acquisition							
S1	Significant Natural Areas	Construction of the GO Station Improvements will result in a larger footprint to accommodate the new platforms, tunnels and other associated structures. As a result, portions of the following Significant Natural Areas will be lost: Unevaluated wetland; Significant Woodland; Significant Valleyland.	• A qualified Environmental Inspector is required throughout the construction period to confirm that protection measures are implemented, maintained and enforced. • Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects. • Clearing and grubbing will occur from the track-side of the natural area and a detailed ESC Plan will be developed to limit damage to the remaining natural areas. • 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. • Detailed clearing, ESC Plans and restoration plans will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects and approved landscaping plans developed prior to construction. • In wetlands: • Wetlands will be restored as necessary to maintain the stability and function of the wetland and will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects and approved landscaping plans developed prior to construction. • In woodlands: • TPZs will be established in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.	Metrolinx/Contractor	There will be reduced on-site vegetation but an overall increase in natural areas through off-site compensation. As such, in the long-term there will be no net effects.	The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.	Contractor/Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• Barriers will be installed around trees to be protected using plywood clad boarding or an equivalent material approved by the municipality. • No stockpiles, storage or disturbance to grade will occur within the TPZ to minimize soil compaction and root damage.				
S2	Significant Natural Areas	Construction laydown areas and easements will be identified prior to construction and there is potential that these areas may result in the loss of/or disturbance to, all natural area types present within the study area.	• All construction laydown areas and easements will be located to avoid natural features (Candidate and Confirmed) to the extent possible. • 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. • 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.	Metrolinx/Contractor	Any disturbed or damaged areas will be returned to their previous condition. As such, no net effects are anticipated.	An Environmental Inspector is required to 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.	Consultant (Environmental Inspector)
S3	Wildlife Habitat	Removal of portions of Candidate and Confirmed SWH and SCC.	• Any vegetation clearing will take place outside of the breeding bird timing window, generally from April 1st to August 31st (Different windows may apply to habitats of SAR, subject to permitting requirements). • 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 Ecologist confirms that the birds have fledged and the nest is no longer active. • If a nesting migratory bird (or SAR protected under ESA, 2007) is identified within or adjacent to the construction site, all activities will stop and the Contractor (with assistance from a	Metrolinx/ Consultant (Detailed Design)/Contractor	There will be reduced on-site wildlife habitat but an overall increase in habitat through off-site compensation. As such, in the long-term there will be no net effects.	An 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. The success of compensation vegetation will be monitored in accordance with the Metrolinx Compensation Protocol.	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			qualified Ecologist/Avian Biologist) shall discuss mitigation measures with Metrolinx - Environment Program and Assessment Department staff. 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. • Habitats with a critical timing window at a different time of year will be assessed by a qualified Ecologist/Avian Biologist prior to any clearing to confirm that the habitat is not in use. If the habitat is being used for critical life functions, the area will be flagged and all clearing within the associated habitat will be avoided until the area is no longer in use; compensation for habitats located within Natural Areas will follow the mitigation measures listed under Significant Natural Features in the Feature column of this table. • Where habitats do not coincide with a Significant Natural Area, compensation measures will be developed, as appropriate. Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects.				
S4	Species at Risk	A number of areas identified as Candidate Habitat of Endangered and Threatened Species will be cleared.	• All requirements of the ESA, 2007 will be met, including the following: • Detailed site surveys will be undertaken during the prior to construction to confirm the presence of the following species: • King Rail; • Least Bittern; • Eastern Whip-poor-will;	Metrolinx/ Consultant (Detailed Design)/Contractor	All requirements under the ESA, 2007, will be met, thus no net effects are anticipated.	Monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA, 2007.	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• Blanding's Turtle; • Little Brown Myotis, Northern Myotis, and Tri-coloured Bat. • Findings of site surveys will be reported to the MNRF. • During the detailed design phase, the GO Station improvements 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 consulted and all requirements under the ESA, 2007, 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. • 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 consulted.				
S5	Nests of Migratory Birds	Nests could be harmed or destroyed as a result of vegetation clearing which is in contravention of the MBCA, 1994.	• Any vegetation clearing will take place outside of the breeding bird timing window, generally from April 1 - to August 31. • 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 Ecologist confirms that the birds have fledged and the nest is no longer active.	Metrolinx/ Consultant (Construction Supervision)/ Contractor	With implementation of the recommended mitigation measures, no net effects are anticipated.	An Environmental Inspector will regularly monitor construction to confirm that activities do not encroach into nesting areas or disturb active nesting sites.	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• If a nesting migratory bird (or SAR protected under ESA, 2007) is identified within or adjacent to the construction site, all activities will stop and the Contractor (with assistance from a qualified Ecologist/Avian Biologist) shall discuss mitigation measures with Metrolinx - Environment Program and Assessment Department staff. In addition, Metrolinx will consult 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.				
S6	Additional Trees at King City GO Station	A total of 32 trees were removed in winter 2015/2016 to accommodate the construction of a new parking lot. Through a total of 96 trees were needed as compensation, 35 trees were planted. The remaining trees that could not be accommodated on-site as compensation will be carried forward as part of the compensation obligation for the BRCE Project.	• The outstanding 61 trees will be addressed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.	Metrolinx/Consultant (Detailed Design)/Contractor	Planting of the required trees will result in an overall long-term gain. As such, in the long-term there will be no net effects.	The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.	Contractor/Consultant (Environmental Inspector)
• **Natural Environment – Construction**							
S7	Significant Natural Areas, Wildlife Habitat and Species at Risk	Grading and soil disturbance during construction can lead to erosion and sedimentation within significant natural features and watercourses and this can affect the quality of habitat, can disturb ground vegetation and negatively affect the quality of fish habitat.	• A qualified Environmental Inspector is required throughout the construction period to confirm that protection measures are implemented, maintained and enforced. • 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. ESC and Dewatering Plans will be developed	Consultant (Detailed Design)/Contractor	Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.	An Environmental Inspector will conduct regular inspections to confirm ESC and dewatering measures are functioning properly and are properly maintained throughout the construction phase.	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			prior to construction in consultation with the TRCA and LSRCA 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). • 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. • ESC and dewatering measures will be implemented prior to construction and maintained during the construction phase in accordance with the ESC and Dewatering Plans. • 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 of the construction site will be stabilized and re-vegetated as soon as conditions allow. • ESC measures will be left in place until all areas of the construction site have been stabilized and will then be removed. • Wet weather restrictions shall be applied during site preparation and excavation. Work will be avoided near watercourses during periods of excessive precipitation and/or excessive snow melt. • A Construction Emergency Response and Communications Plan will be developed prior to construction and followed throughout the construction phase (includes spill response plans).				

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• The Contractor will develop spill prevention and contingency plans and have them in place prior to construction of the BRCE 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 watercourses will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. Spills will be reported to the Ontario Spills Action Centre at 1-800-268-6060.				
S8	Significant Natural Areas, Wildlife Habitat and Species at Risk	Stockpiled materials, equipment or construction activities could accidentally encroach into natural areas beyond the proposed ROW limits and this could add to the disturbance of natural features and increase the quantity lost as a result of the BRCE Project. Soils beyond the proposed ROW limits could also become compacted or disturbed from activities that extend beyond approved limits.	• 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 Plan will outline a process of resolving issues of extended encroachment, including clean-up, maintenance of ESC measures, and consideration of alternative ESC measures. • 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).	Consultant (Detailed Design)/Contractor	All effects are expected to be temporary, thus no net effects are anticipated.	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.	Consultant (Environmental Inspector)
S9	Significant Natural Areas, Wildlife Habitat and Species at Risk	There is potential for spills of fuels or other hazardous materials to occur during fueling of construction equipment or other construction activities that can affect groundwater quality and the health of vegetation and wildlife within natural areas.	• 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). • Deleterious substances (including stockpiled material) will be used and stored in a manner that prevents any of the substances from entering a natural feature. • A Hazardous Materials and Fuel Handling Plan will be developed prior to Project construction,	Contractor	Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.	An Environmental Inspector is required to inspect and confirm ESC measures are functioning properly and are properly maintained throughout the construction phase. Workers will report any instances of spills to their supervisors.	Contractor/ Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			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. • The Contractor will develop spill prevention and contingency plans and have them in place prior to construction of the BRCE 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 watercourses or 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.				
S10	Significant Natural Areas, Wildlife Habitat and Species at Risk	Any disturbance to lands and vegetation clearing has the potential to allow invasive species to be introduced and spread through natural areas and invasive species can prevent other native species from re-establishing.	• All disturbed areas of 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.	Contractor	Metrolinx will work in accordance with the requirements of the *Invasive Species Act*. Thus, no net effects are anticipated.	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% survival rate and confirm that non-native and invasive species are not becoming pervasive as a result of the BRCE Project, unless otherwise specified within the Vegetation Compensation	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• Where re-vegetation is required, a native seed mix, which does not contain invasive species, will be used. • If extensive invasion of non-native species is identified as a result of the BRCE Project, contingency measures may include an applicable herbicide application. A herbicide application plan will be developed as required and submitted to the applicable conservation authority for review.			Protocol for Metrolinx RER Projects.	
S11	Significant Natural Areas, Wildlife Habitat and Species at Risk	Tunnels will be constructed at each Station to allow passengers to safely cross the corridor to access new platforms. Tunneling will require dewatering and the discharge of that water to the environment. Dewatering may be required for other below-ground (sub-surface) work.	• All requirements under the OWRA, R.S.O. 1990, c. O.40 with respect to the quality of water discharging into natural receivers will be met, including the following mitigation measures and best practices: • 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. • If significant changes in water levels/seepage areas are noted, operations will cease until water levels recover.	Contractor	All dewatering will be conducted in accordance with regulatory requirements. As such, no net effects are anticipated.	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 confirm that no sediment is entering significant natural features or watercourse.	Consultant (Environmental Inspector)
S12	Significant Natural Areas, Wildlife Habitat and Species at Risk	Dust created as a result of construction has the potential to settle on adjacent vegetation, disturbing wildlife and their habitat.	• Dust from the work areas will be controlled through suppressants (e.g., water).	Contractor	Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net	An Environmental Inspector will regularly inspect dust emissions during construction to confirm dust control watering frequency and rates are adequate.	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
					effects are anticipated.		
S13	Significant Valleylands	There is a Significant Valleyland associated with Westminster Creek at the Rutherford GO Station and this valley feature could be disturbed by vegetation removal, grading work and the movement of large equipment which could result in erosion, slumping or slope failure.	• 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 TRCA and 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.	Metrolinx/ Consultant (Detailed Design)/Contractor	All requirements for working in proximity to steep slopes and watercourses will be met. Conservation authorities will continue to be consulted throughout the detailed design process. Thus, no net effects are anticipated.	An Environmental Inspector will conduct regular inspections to confirm that all work is conducted in accordance with plans and any recommendations provided through the conservation authority voluntary review.	Consultant (Environmental Inspector)
S14	Fish Habitat	Fish habitat is present at the Rutherford, King City, East Gwillimbury and Bradford GO Stations. New platforms may result in the need to extend culverts or construct in, and around, water. This work has the potential to harm fish habitat.	• An Aquatic Habitat Assessment will be prepared prior to 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 identified in the Aquatic Habitat Assessment. • 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	Metrolinx/ Consultant (Detailed Design)/Contractor	All in-water and near-water works will be completed in accordance with the requirements of the *Fisheries Act* and industry BMPs. Thus, no net effects are anticipated.	An Environmental Inspector will conduct regular inspections to confirm that all work is conducted in accordance with the Fisheries Act and any associated permits/approvals.	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			requirements in order to avoid hydrologic affects. • All requirements under the Fisheries Act will be met including any Self-Assessments or permitting.				
S15	Tree Removals at Rutherford, King, Newmarket, Bradford, and Barrie South GO Stations	Trees present within the proposed development envelope will require removal. The approximate removals based on field investigations are as follows: Rutherford Total Existing ROW Tree Removal 3 Total Expanded ROW Tree Removal 15 King City Total Existing ROW Tree Removal (estimated) 30 Total Expanded ROW Tree Removal 0 Trees removed to accommodate the new parking lot at 55 Station Road 32 Newmarket Total Existing ROW Tree Removal (estimated) 41 Total Expanded ROW Tree Removal 71 Bradford Total Existing ROW Tree Removal (estimated) 0	• Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects.	Metrolinx/Contractor	Reduced on-site tree canopy but overall increase in number of trees in landscape through off-site planting.	Monitor success and tend to new plantings in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.	Contractor/ Consultant (Environmental Inspector)
			• An assessment of trees within and on lands immediately adjacent to ROW to be completed prior to the construction phase to determine required setbacks and protection measures.	Consultant (Detailed Design – Certified Arborist)	No net effects are anticipated.	Conduct a post-construction assessment of trees to determine if injuries to the preserved trees have occurred or their health and/or structure has deteriorated. If deterioration or injury has occurred, identify and implement any necessary pruning, mitigation or removal of trees by a Certified Arborist.	Consultant (Certified Arborist)
			• TPZs to be implemented on retained trees through construction of barriers.	Contractor/ Consultant (Environmental Inspector)	No net effects are anticipated	Monitor construction by contractors for unauthorized encroachment into vegetated areas and TPZs. Monitor silt fencing and/or tree protection barrier to confirm proper installation and functionality.	Consultant (Environmental Inspector)
			• Inspect and assess for hazardous limbs and trees for removal prior to commencement of use of the second track.	Consultant (Certified Arborist)	No net effects are anticipated.	Inspections will identify dead trees or limbs adjacent to ROW.	Consultant (Certified Arborist)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		Total Expanded ROW Tree Removal (estimated) 20 Barrie South Total Existing ROW Tree Removal (estimated) 0 Total Expanded ROW Tree Removal (estimated) 114 Impacts to trees adjacent to the work zone may result in unintended root damage or tree felling.					
S16	Tree Removals at Maple, Aurora, East Gwillimbury and Allandale Waterfront GO Stations	No anticipated tree removals and no impacts to trees.	• No mitigation measures are required.	Not applicable.	No net effects are anticipated.	Oversee fencing protecting off-site features.	Consultant (Environmental Inspector)
Natural Environment – Operations and Maintenance							
S17	Significant Natural Areas, Wildlife Habitat and Species at Risk	Any grading or earth moving required for maintenance purposes can result in sedimentation within adjacent natural features, degrading habitats and harming vegetation and wildlife.	• Any major maintenance work that would result in the replacement or upgrade of major infrastructure components requiring earth-moving or in-water 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.	Metrolinx/Contractor (Maintenance)	With implementation of the recommended mitigation measures, no net effects are anticipated.	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.	Metrolinx/ Contractor (Maintenance)
S18	Significant Natural Areas, Wildlife Habitat and Species at Risk	Trees adjacent to the GO Stations may need to be trimmed and cleared. Trimming has the potential to harm healthy trees. Any use of chemical pesticides to maintain GO Station areas also has the potential to affect groundwater and adjacent natural features if not applied correctly.	• Any herbicide applications to clear vegetation within the 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.	Metrolinx/Contractor (Maintenance)	Vegetation trimming is not expected to have any significant effects. Thus, no net effects are anticipated.	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.	Metrolinx/ Contractor (Maintenance)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• 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.				
S19	Significant Natural Areas, Wildlife Habitat and Species at Risk	Spills of fuel and other hazardous materials 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.	• An Emergency Response and Communications Plan will be developed and followed throughout the operations and maintenance phase (includes spill response 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. • Spills or depositions into watercourses or 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.	Metrolinx/Contractor (Maintenance)	Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.	GO Station staff and maintenance contractors responsible for reporting spills and other issues and ensuring their timely resolution.	Metrolinx/ Contractor (Maintenance)
S20	Tree Removals at Rutherford, King, Newmarket, Bradford, and Barrie South GO Stations	Deterioration of trees' vitality over time that are adjacent to the GO Station sites.	• Pruning or removal of trees to prevent woody material from falling on the station lands or corridor.	Metrolinx Consultant (Certified Arborist)	No net effects are anticipated.	Inspect and assess trees on adjacent lands annually (at minimum).	Metrolinx Consultant (Certified Arborist)
Cultural Environment – Construction							
S28	Potential Archaeological Resources at King, Aurora, Newmarket,	Land-disturbing construction activities have the potential to impact archaeological resources in areas of archaeological potential.	• A Stage 2 Archaeological Assessment will be required prior to construction in the affected areas determined to have archaeological potential as per the Stage 1 Archaeological	Metrolinx/licenced consultant archaeologist	Upon implementation of the mitigation and monitoring measures recommended for the	The Consultant (Environmental Inspector) shall monitor land-disturbing construction activities to	Consultant (Environmental Inspector)/ Contractor/ Metrolinx/

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
	East Gwillimbury, Bradford, Barrie South, and Allandale Waterfront GO Stations		Assessment provided in Appendix C of this EPR. • The Stage 2 Archaeological Assessment will involve a pedestrian or test pit survey to further define areas of archaeological potential and determine whether further studies or mitigation measures are required. • Further studies (e.g., Stage 2, Stage 3, Stage 4) and associated mitigation measures will be implemented where required in accordance with the recommendations made by the licenced consultant archaeologist. • If prior to construction it is confirmed that the BRCE Project extends beyond the currently identified study area, then further Stage 1 Archaeological Assessment will be conducted to determine the archaeological potential of the affected lands. • In the event that previously undocumented archaeological remains are found during construction activities, the proponent or person discovering the archaeological resources will cease alteration of the site immediately, and the Consultant Archaeologist, approval authority, and the Cultural Programs Unit of the MTCS will be immediately notified. • In the event that human remains are discovered, the person discovering the human remains will also immediately notify the police or coroner.		Project by the licenced consultant archaeologist, no net effects related to archaeological resources are anticipated.	confirm they remain within the study area subject to the archaeological assessment(s). Any site personnel responsible for carrying out or overseeing land-disturbing construction activities shall be informed of their responsibilities in the event that an archaeological resource is encountered.	Licenced consultant archaeologist
S29	Potential Huron-Wendat ossuaries	Land-disturbing construction activities have the potential to disturb ossuaries at: • The Hope site (AlGv-199).	• A licenced consultant archaeologist will be present to monitor the removal of topsoil for all lands within the study area identified to possess potential for an ancestral Huron-Wendat ossuary.	Metrolinx/licenced consultant archaeologist	Upon implementation of the mitigation and monitoring measures recommended for the Project by the licenced consultant archaeologist, no net	The Consultant (Environmental Inspector) shall monitor land-disturbing construction activities to confirm they remain within the study area subject to	Consultant (Environmental Inspector)/ Contractor/ Metrolinx/ Licenced consultant archaeologist

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		• Allandale site (Borden #BcGw-69).	• At the Allandale site, archaeological monitoring will be undertaken of any proposed effect on the site as well as any crawl spaces or soils beneath existing structures without basements. • In the event that previously undocumented archaeological remains are found during construction activities, the proponent or person discovering the archaeological resources will cease alteration of the site immediately, and the Consultant Archaeologist, approval authority, and the Cultural Programs Unit of the MTCS will be immediately notified. • In the event that human remains are discovered, the person discovering the human remains will also immediately notify the police or coroner.		effects related to archaeological resources are anticipated.	the archaeological assessment(s). Any site personnel responsible for carrying out or overseeing land-disturbing construction activities shall be informed of their responsibilities in the event that an archaeological resource is encountered.	
S22	PHPPS	Land clearing activities required to accommodate the proposed Aurora GO Station improvements may directly impact one PHPPS (the Aurora GO Station).	• Repaving the platform provides the opportunity to undertake the repair of the deteriorating wood base of the station building. • New platform shelters should be placed away from sightlines to the station building as much as possible while respecting the building's functional link to the railway. Their design should adhere to the Metrolinx Design Excellence Guidelines and the guidelines specific to Aurora GO Station. • New stair enclosures, elevators and partial platform canopies at the north tunnel should be placed away from sightlines to the station building as much as possible while respecting the building's functional link to the railway tracks. Their design should adhere to the *Metrolinx Design Excellence Guidelines* and the guidelines specific to Aurora GO Station. • The location of the northeast stair enclosure must consider potential impacts to the footing of the station building portico and the foundation of	Metrolinx/Qualified Heritage Consultant	Impacts to the CHR at this property will be appropriately mitigated or avoided as much as possible through implementation of the recommendations outlined in the HIA.	No monitoring activities are required.	N/A

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			the building, including its angle of repose, through geotechnical study. The caisson wall indicated as a solution to protect the railway bed could be extended to isolate and protect the station building. • A comprehensive protection plan should be established for the station building to mitigate any impact from construction, such as incidental contact from machine operations which could damage the structure or the finishes. It should include a protective zone around the building. • New and replacement lighting, public address, closed-circuit television and fare systems should be placed away from sightlines to the station building as much as possible while respecting the building's functional link to the railway. Their design should adhere to the Metrolinx Design Excellence Guidelines and the guidelines specific to Aurora GO Station.				
S23	PHP and Conditional PHP	Construction activities for the construction of GO Station improvements could directly impact the heritage attributes of CHRs: PHP: • Bradford GO Station (Mile 41.60). Conditional PHP: • 91 Franklin Street (Mile 34.44).	• HIAs/Strategic Conservation Plans will be completed in accordance with the Standards and Guidelines prior to Project construction. The HIAs will be developed in consultation with and submitted for review to MTCS and other heritage stakeholders (municipal planners and municipal heritage committee). The HIAs will discuss the alternatives considered, and that all other alternatives to the alterations to these structures have been considered and the best alternative has been adopted. The HIAs will also make recommendations to minimize or mitigate adverse effects on the property resulting from the removal and demolition.	Metrolinx/Qualified Heritage Consultant	Impacts to CHRs at these affected properties will be appropriately mitigated or avoided as much as possible through implementation of the recommendations outlined in the HIAs.	Monitoring activities will be in accordance with the HIAs.	To be determined through HIAs.
S24	PHP, Conditional PHP and Adjacent Properties	Construction activities for the construction of GO Station improvements could indirectly impact the heritage attributes of CHRs:	As summarized in Table 4-11, mitigation will include one or more of the following: • Undertake consultation with heritage staff at the respective municipality to review the detailed design	Metrolinx/Qualified Heritage Consultant	Impacts to CHRs will be appropriately mitigated or avoided as much as possible	Monitoring activities will be in accordance with HIAs and/or components of this	To be determined through HIAs and/or components of this study (e.g., vibration and tree removal monitoring).

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		PHP: • Maple GO Station (Mile 18.28). Conditional PHP: • Newmarket GO Station/Tannery Mall (Mile 34.35). Adjacent Properties: • Maple Village Heritage Conservation District (HCD), Designated Part V OHA (Mile18.10-18.30); and • Former Allandale Train Station (Mile 63.00).	for the BRCE works, once available, and determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, an HIA will be completed during detailed design or prior to Project construction to confirm that impacts of heritage resources are appropriately mitigated. • Potential effects on adjacent CHRs due to increased vibration will be assessed during detailed design in accordance with the Noise and Vibration Impact Assessment provided in Appendix H of this EPR and the Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects (Wilson, Ihrig & Associates Inc., et. al., 2012). • Municipal heritage staff, and PDP as applicable, will be consulted regarding the visual aesthetics of the noise walls. • Any tree removal will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER projects, described in the Tree Inventory Plan and Arborist Report found in Appendix B of this EPR.		through implementation of the mitigation measures to be identified in the recommended HIAs and/or mitigation carried out in accordance with other components of this study (e.g., vibration and tree removal mitigation).	study (e.g., vibration and tree removal monitoring).	
Cultural Environment – Operations and Maintenance							
S35	Architectural Resource Lands Within BRCE Rail Corridor	Upon completion of construction, no potential effects related to archaeological resources are anticipated.	• No mitigation measures are required.	Not applicable.	No net effects anticipated.	No monitoring activities are required.	Not applicable.
S36	CHR Lands Within BRCE Rail Corridor	Upon completion of construction and implementation of the corresponding recommended mitigation measures,	• No mitigation measures are required.	Not applicable.	No net effects anticipated.	No monitoring activities are required.	Not applicable.

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		no potential effects to CHRs are anticipated.					
Social and Built Environment – Pre-Construction Land Clearing/Property Acquisition							
S37	All Land Uses	Tree removal may pose undesirable aesthetic effects on all land uses, including residences, businesses, institutions and parks.	• Metrolinx will coordinate tree removal compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects, as documented in the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR. • Where appropriate, Metrolinx will seek to develop an aesthetically pleasing design for public-facing infrastructure in consultation with municipalities/adjacent landowners.	Metrolinx/Consultant (Detailed Design)/Contractor	Reduced on-site tree canopy but overall increase in number of trees in landscape through off-site planting.	Monitor success and tend to new plantings in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects. Post-construction monitoring will be carried out by a Landscape Architect (licensed to practice in the province of Ontario) or other party identified in the compensation strategy.	Contractor/ Consultant (Environmental Inspector)
S38	Residential and Commercial Land Uses	Acquisition of lands with private residences and businesses: Acquisition of seven full and eight partial residential and commercial properties, resulting in: Decrease in 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 property types. Loss of customer parking or reduced delivery areas on commercial lands.	• Confirm specific property requirements prior to construction to determine predicted property impacts. • Engage and negotiate with affected property owners regarding land acquisition and easements required for the proposed works. • Provide fair market value compensation to affected property owners in accordance with applicable laws.	Metrolinx/Consultant (Detailed Design)	The effects to properties will be mitigated by providing fair market value compensation in accordance with applicable laws and through negotiations with affected property owners. Net effects are expected to be insignificant.	No monitoring activities are required.	Not applicable.

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
S39	Agricultural Lands	Acquisition of lands providing economic resources: A total of 0.02 ha of agricultural lands will be acquired. The amount is minor on each property and is expected to result in a minimal or negligible reduction in productivity, yields and income for farm owners. No loss to any lands within the Specialty Crop Area associated with the Holland Marsh. Potential to disrupt farm infrastructure, including fencing, tile drainage and irrigation systems. The presence of this infrastructure has not been confirmed and the extent of impacts is unknown.	• Confirm specific property requirements prior to construction to determine predicted property impacts. • Engage and negotiate with affected property owners regarding land acquisition and easements required for the proposed works and to identify any potential impacts to farm infrastructure such as livestock fencing, irrigation systems and tile drainage. • Provide fair market value compensation to affected property owners in accordance with applicable laws. • Mitigation measures will be developed in consultation with individual owners.	Metrolinx/Consultant (Detailed Design)	The effects to agricultural lands will be mitigated by providing fair market value compensation in accordance with applicable laws and through negotiations with affected property owners. As such, net effects are expected to be insignificant.	No monitoring activities are required.	Not applicable.
S40	Recreational and Open Space Lands (Parks and Trails)	Acquisition of community amenity areas (Parks and Trails): Acquisition of 1.19 ha of park lands and other open spaces will be required. No physical structures or trails will be affected. Minor park structures may be affected, including fencing, drainage, parking and entrance areas.	• Metrolinx will engage with park owners/operators throughout detailed design and prior to construction to confirm predicted effects. Mitigation measures will be developed in consultation with individual owners, as required.	Metrolinx	No net affects anticipated, though there are opportunities to improve trails and trail access to GO Stations.	No monitoring activities are required.	Not applicable.
S41	Future Growth Areas	Acquisition of lands within Growth Areas: Community Growth Targets: 0.47 ha within the Newmarket Urban Centres Secondary Plan Area, and 0.70 ha within the Aurora Promenade Secondary Plan Area are to be acquired. Property acquisitions are	• Continue to consult with municipalities throughout detailed design and prior to construction. • Confirm specific property requirements prior to construction to determine predicted property impacts.	Metrolinx/Consultant (Detailed Design)	No net effects are anticipated.	No monitoring activities are required.	Not applicable.

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		not likely to significantly affect future growth targets or development potential. Effects are expected to be minimal.	• Engage and negotiate with affected property owners regarding land acquisition and easements required for the proposed works. • Provide fair market value compensation to affected property owners in accordance with applicable laws.				
Social and Built Environment – Construction							
S42	All Land Uses	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.	• 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. • 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.	Contractor	The temporary nuisance effects during construction will be minimized to the extent practical. As such, net effects are predicted to be insignificant.	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.	Consultant (Environmental Inspector)
S43	All Land Uses	Temporary visual effects to residential and other visually-sensitive land uses such as parks, places of worship and cemeteries, caused by temporary storage sites for equipment, staging/laydown areas, stockpiling of materials, etc.	• 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.	Contractor	The temporary visual effects will be minimized to the extent practical. As such, net effects are predicted to be insignificant.	Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with 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.	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
S44	All Land Uses	Longer term visual effects resulting from the removal of trees that currently provide a visual buffer from the corridor.	• Metrolinx will coordinate tree removal compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects, as documented in the Tree Inventory Plan and Arborist Report provided in Appendix B of this EPR. • Where appropriate, Metrolinx will seek to develop an aesthetically pleasing design for public-facing infrastructure in consultation with municipalities/adjacent landowners.	Metrolinx/Consultant (Detailed Design)/Contractor	Reduced on-site tree canopy but overall increase in number of trees in landscape through off-site planting.	Monitor success and tend to new plantings in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.	Contractor/ Consultant (Environmental Inspector)
S45	All Land Uses	Temporary encroachment on adjacent lands for construction purposes (e.g., access, establishment of equipment storage/laydown areas, stockpiling of materials, etc.) through the use of construction easements or TLIs.	• A review will be completed prior to the construction phase to identify temporary easements for construction or other purposes, and permanent property acquisition requirements to accommodate the BRCE Project work. • Construction will be planned to limit the need for construction easements to the extent possible. • Metrolinx will engage and negotiate with affected land owners regarding easements required.	Metrolinx/Consultant (Detailed Design)	The temporary encroachment effects will be minimized to the extent practical. As such, net effects are predicted to be insignificant.	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.	Consultant (Environmental Inspector)
S46	Transit Riders	Temporary inconvenience (e.g., station parking and access constraints, adjacent road impacts, etc.) to transit riders due to construction.	• Metrolinx will keep GO Stations operational during the construction period. • If the need for a closure arises, GO Buses will be available to take transit users to the next available station. • Construction equipment and stockpiles will be staged to limit disruption to transit service and access to the extent possible. • The intent is to maintain as much of the existing GO Station parking lot facilities as possible by utilizing other off-site and non-parking areas for construction related activities wherever feasible.	Contractor/Metrolinx	The temporary effects to transit riders during construction will be minimized to the extent practical. As such, net effects are predicted to be insignificant.	Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with plans and within specified construction zones.	Consultant (Environmental Inspector)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
S47	Vehicle, Pedestrian, Cyclist and Agricultural Traffic	Temporary road or lane closures causing access restrictions to affected parks, residences, parks, businesses, institutions, farm lands and operations, bike lanes, local transit and the stations themselves.	• Determine adequate construction hauling routes in consultation with municipalities. • Prepare site-specific Traffic Control and Management Plans prior to construction and implement during 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.	Metrolinx/Consultant (Detailed Design)	The temporary restrictions to access points will be minimized to the extent practical. As such, net effects are predicted to be insignificant.	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.	Consultant (Environmental Inspector)
S48	Air Quality of Lands Adjacent to GO Station Improvements	Fugitive dust emissions resulting from: Soil excavation and filling activities. Demolition of structures. Stockpiling of soil and other friable construction materials. Transportation of friable fill materials via dump trucks. Emissions resulting from the combustion engines of construction equipment.	• Dust suppression measures as needed to control fugitive dust emissions in accordance with the Cheminfo Services Inc. March 2005 publication Best Practices for the Reduction of Air Emissions From Construction and Demolition Activities. • Concrete saws with water control will be used wherever possible. • Stockpiling of soil and other friable materials in locations that are less exposed to wind. • Use of dump trucks with retractable covers for the transport of friable fill materials. • Use of deconstruction methods in lieu of demolition where feasible. • Minimized drop heights and use of enclosed chutes and cover bins for debris associated with deconstruction of affected structures. • Washing of equipment and/or use of mud mats where practical at construction site exits to limit the migration of soil and dust off-site. • Use of ESC measures such as silt fence and erosion control blankets to address areas with temporary unstabilized soil.	Contractor	Potential air quality effects are expected to be temporary and localized to the areas adjacent to the stations. Effects reduced through implementation of construction BMPs.	Environmental Inspector to frequently check the effectiveness of mitigation measures and construction BMPs to confirm they are functioning as intended. In the event that mitigation is found to not be effective, the Contractor will be notified to implement revised mitigation measures designed to improve 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 make adjustments as required. Monitoring will continue throughout the construction phase until activities are complete, all exposed soils	Consultant (Environmental Inspector) and Contractor

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• Permanent stabilization of exposed soil areas with non-erodible material (e.g., stone or vegetation) as soon as practicably possible after construction in the affected area is complete. • Ensuring that all construction vehicles, machinery, and equipment are equipped with current emission controls, and in a state of good repair.			have been stabilized, and all construction waste has been cleaned up. The Contractor will establish a complaint response protocol for nuisance effects such as dust.	
S49	Acoustic Environment of Lands Adjacent to the GO Station Improvements	Potential effects are generally limited to the lands adjacent to the GO Station improvements, and may be perceived as a short term nuisance to affected building occupants due to: Demolition of existing structures. Breaking of asphalt and concrete through the use of hydraulic hammers or jack hammers. Soil excavation, grading, compaction, and pile driving.	• Construction BMPs will be employed to minimize any adverse effects from construction noise at nearby sensitive receptors. This includes, but is not limited to, the mitigation measures described for the construction of the new rail infrastructure. • 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. • 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.	Contractor/Metrolinx	Construction related impacts will be minimized through implementation of applicable construction BMPs. No net effects, including damage to neighbouring property or infrastructure, are anticipated.	Construction activities will be monitored by a qualified Environmental Inspector who will check and confirm the effectiveness of construction BMPs employed to minimize any adverse effects from construction noise at nearby sensitive receptors. This includes, but is not limited to, the monitoring measures described for the construction of the new rail infrastructure.	Consultant (Environmental Inspector) and Contractor
S50	Vibrational Environment of Lands Adjacent to the GO Station Improvements	Nuisance to adjacent building occupants resulting from construction activities causing vibrations, typically involving: Demolition of existing structures. Breaking of asphalt and concrete through the use of hydraulic hammers or jack hammers.	• Implement construction BMPs including but not limited to the following: • Deconstruction procedures in lieu of demolition of affected existing structures wherever feasible. • Refraining from the use of blasting. • Using saws to break up existing asphalt and concrete instead of hydraulic hammers or jack hammers, wherever possible and practical.	Contractor/Metrolinx	Adjacent building occupants may temporarily be subjected to increased vibration levels from construction activities. No damage to neighbouring	Environmental Inspector to check the effectiveness of mitigation measures and construction BMPs to confirm they are functioning as intended. In the event that mitigation is found to not be effective, the Contractor will be notified to implement revised mitigation measures	Consultant (Environmental Inspector) and Contractor

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		Soil excavation, grading, compaction, and pile driving. Potential damage to adjacent property or infrastructure.	• Using soil compaction techniques that minimize the need for dynamic compaction, or wherever dynamic compaction is necessary, making adjustments to minimize vibrations (e.g., using smaller falling weights). • Wherever feasible, design foundations for infrastructure that minimizes the need or extent of pile driving, and wherever pile driving is necessary, use methods that minimize vibrations (e.g., pre-drilling, switching impact with vibratory hammer, using augured cast-in-place piles, drilled shafts, etc.). • 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 vibration effects.		property or infrastructure is anticipated.	designed to improve effectiveness. In the event that the Contractor or Environmental Inspector notices or is made aware of property or infrastructure damage caused by construction vibration, the Contractor will immediately stop work in the area. The Contractor will develop a restoration plan in consultation with the property or infrastructure owner, and will complete the work using alternative methods to prevent further damage. The Contractor will establish a complaints response protocol for vibration effects.	
S51	Rutherford GO Station	Construction access is required to the east side of the tracks which is constrained by the local residential development in that area. Temporary access may be needed from Rutherford Road, which could cause minor traffic disruptions.	• Coordinate construction with York Region as it relates to its proposed Rutherford Road grade separation project. • Determine adequate construction hauling routes in consultation with municipalities. • Prepare and implement site-specific Traffic Control and Management Plan including delineation of staging areas, wayfinding signage, parking lot adjustments, etc.	Metrolinx/ Consultant (Detailed Design)	With the implementation of a site-specific Traffic Control and Management Plan, traffic disruption will be minimized.	Monitor construction access to confirm effects are minimized (e.g., dust, mud tracking, property or environmental damage) and respond to complaints in an effective and timely manner. Monitor parking effects during construction.	Contractor
S52	Maple GO Station	Construction access is required to the west side of the tracks and is constrained by the local residential development in that area.	• Consider temporary off-site parking and shuttle buses if parking is significantly reduced due to construction activities.	Metrolinx/ Consultant (Detailed Design)	Temporary reduction in parking at the station and decreased	Monitor construction access to confirm effects are minimized (e.g., dust, mud tracking, property or environmental damage),	Contractor

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		Construction staging areas may have minor effects on existing GO Station parking areas.	• Determine adequate construction hauling routes in consultation with municipalities. • Prepare and implement site-specific Traffic Control and Management Plan including delineation of staging areas, wayfinding signage, parking lot adjustments, etc.		convenience for GO riders.	and respond to any complaints in an effective and timely manner.	
S53	King City GO Station	Construction access is from the west side of the tracks and is constrained by the existing GO Station parking area and adjacent environmental areas. Platform work will remove some parking at this station.	• Determine adequate construction hauling routes in consultation with municipalities. • Prepare and implement site-specific Traffic Control and Management Plan including delineation of staging areas, wayfinding signage, parking lot adjustments, etc.	Consultant (Detailed Design)	Reduction in parking at the station and decreased convenience for GO riders.	Monitor pedestrian access and parking during construction, and respond to any complaints in an effective and timely manner.	Contractor
S54	Aurora GO Station	Construction zone of new platform will temporarily affect pedestrian access to existing platform and will reduce the available parking at this station. Construction access to be through existing GO Station parking lot, which may temporarily reduce parking and inconvenience GO riders.	• Consider temporary off-site parking and shuttle buses if parking is significantly reduced due to construction activities. • Determine adequate construction hauling routes in consultation with municipalities. • Prepare and implement site-specific Traffic Control and Management Plan including delineation of staging areas, wayfinding signage, parking lot adjustments, etc.	Consultant (Detailed Design)	Reduction in parking at the station and decreased convenience for GO riders.	Monitor pedestrian access and parking during construction. Monitor construction access to confirm effects are minimized (e.g., dust, mud tracking, property or environmental damage) and respond to any complaints in an effective and timely manner.	Contractor
S55	Newmarket GO Station	Construction access from the west side of the tracks is constrained (local residential streets, environmental areas).	• Determine adequate construction hauling routes in consultation with municipalities. • Prepare and implement site-specific Traffic Control and Management Plan including delineation of staging areas, wayfinding signage, parking lot adjustments, etc.	Consultant (Detailed Design)	No net effects are anticipated during construction.	Monitor construction access to confirm effects are minimized (e.g., dust, mud tracking, property or environmental damage), and respond to any complaints in an effective and timely manner.	Contractor
S56	East Gwillimbury GO Station	Need for construction access from Green Lane East, through lands to the east of the tracks.	• Determine adequate construction hauling routes in consultation with municipalities. • Prepare and implement site-specific Traffic Control and Management Plan including	Consultant (Detailed Design)/ Contractor	No net effects are anticipated during construction, assuming	Monitor construction access to confirm effects are minimized (e.g., dust, mud tracking, property or	Contractor

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		Potential temporary closure or detour of existing trail system along the east side of the rail ROW.	delineation of staging areas, wayfinding signage, parking lot adjustments, etc. • Temporarily re-route trail system around the construction zone.		agreements made for construction access and staging.	environmental damage), and respond to any complaints in an effective and timely manner.	
S57	Bradford GO Station	Construction access to be through existing GO Station parking lot, which will temporarily reduce the available parking at this station and affect pedestrian access to the existing platform.	• Consider temporary off-site parking and shuttle buses if parking is significantly reduced due to construction activities. • Determine adequate construction hauling routes in consultation with municipalities. • Prepare and implement site-specific Traffic Control and Management Plan including delineation of staging areas, wayfinding signage, parking lot adjustments, etc.	Consultant (Detailed Design)	Temporary reduction in parking at the station and decreased convenience for GO riders.	Monitor pedestrian access and parking during construction. Monitor construction access to confirm no negative effects (e.g., dust, mud tracking, property or environmental damage) and respond to any complaints in an effective and timely manner.	Contractor
S58	Barrie South GO Station	Construction access from Mapleview Drive East is likely not feasible and therefore construction access will be required through the existing GO Station Access, which will temporarily reduce the available parking at this station and may affect pedestrian access to the existing platform.	• Consider temporary off-site parking and shuttle buses if parking is significantly reduced due to construction activities. • Determine adequate construction hauling routes in consultation with municipalities. • Prepare and implement site-specific Traffic Control and Management Plan including delineation of staging areas, wayfinding signage, parking lot adjustments, etc.	Consultant (Detailed Design)	Temporary reduction in parking at the station and decreased convenience for GO riders.	Monitor construction access to confirm effects are minimized (e.g., dust, mud tracking, property damage etc.) and respond to any complaints in an effective and timely manner. Monitor parking effects during construction.	Contractor
S59	Allandale Waterfront GO Station	Construction of new platform may temporarily affect existing GO Station parking on Gowan Street.	• Make arrangements for temporary parking off-site, with shuttle bus connection, if required. • Determine adequate construction hauling routes in consultation with municipalities. • Prepare and implement site-specific Traffic Control and Management Plan including delineation of staging areas, wayfinding signage, parking lot adjustments, etc.	Consultant (Detailed Design)/ Metrolinx	Temporary reduction in parking at the station and decreased convenience for GO riders.	Monitor construction access to confirm effects are minimized (e.g., dust, mud tracking, property damage etc.) and respond to any complaints in an effective and timely manner. Monitor parking effects during construction.	Contractor
S60	Existing utilities at Rutherford GO Station	Metrolinx signals infrastructure running parallel to the existing tracks	• Mitigation measures will be further reviewed prior to construction phase.	Consultant (Detailed Design)/ Contractor	No net effects anticipated.	To be in accordance with the utility owner's protocols.	Contractor/ Consultant (Construction Inspection)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		may be affected by the GO Station improvements.	• The signals infrastructure will be protected during construction.				
S61	Existing utilities/municipal infrastructure at Maple GO Station	Existing telecom and sanitary sewer crossing may be affected by the GO Station improvements.	• Mitigation measures will be further reviewed prior to the construction phase. • The telecom will be protected during construction.	Consultant (Detailed Design)/ Contractor	No net effects anticipated.	To be in accordance with the utility owner's protocols.	Contractor/ Consultant (Construction Inspection)
S62	Existing utilities at King City GO Station	Metrolinx electrical infrastructure crossing and parallel to existing tracks may be affected by the GO Station improvements.	• Mitigation measures will be further reviewed prior to the construction phase. • Metrolinx electrical infrastructure crossing and parallel to existing tracks will be relocated as part of the station improvements.	Consultant (Detailed Design)/ Contractor	No net effects anticipated.	To be in accordance with the utility owner's protocols.	Contractor/ Consultant (Construction Inspection)
S63	Existing utilities/municipal infrastructure at Aurora GO Station	Two storm sewers crossing the location of the proposed tracks and one overhead utility crossing the existing tracks may be affected by the GO Station improvements.	• Mitigation measures will be further reviewed prior to the construction phase.	Consultant (Detailed Design)/ Contractor	No net effects anticipated.	To be in accordance with the utility owner's protocols.	Contractor/ Consultant (Construction Inspection)
S64	Existing utilities/municipal infrastructure at Newmarket GO Station	Metrolinx signals that cross and run parallel to the existing rail ROW may be affected by the GO Station improvements. Three sanitary sewers and one watermain may be affected by the GO Station improvements.	• Mitigation measures will be further reviewed prior to the construction phase. • The Metrolinx signals infrastructure will be protected during construction.	Consultant (Detailed Design)/ Contractor	No net effects anticipated.	To be in accordance with the utility owner's protocols.	Contractor/ Consultant (Construction Inspection)
S65	Existing utilities at East Gwillimbury GO Station	There are no potential effects from the GO Station improvements to the Metrolinx signals run parallel to the existing tracks.	• No mitigation measures are required.	Not applicable.	No net effects anticipated.	No monitoring activities are required.	Not applicable.
S66	Existing utilities at Bradford GO Station	The gas main and telecom may be affected by the GO Station improvements.	• Mitigation measures will be further reviewed prior to the construction phase. • The telecom crossing the existing tracks will be protected during construction.	Consultant (Detailed Design)/ Contractor	No net effects anticipated.	To be in accordance with the utility owner's protocols.	Contractor/ Consultant (Construction Inspection)

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
S67	Existing municipal infrastructure at Barrie South GO Station	A storm sewer storm may be affected by the GO Station improvements.	• Mitigation measures will be further reviewed prior to construction.	Consultant (Detailed Design)/ Contractor	No net effects anticipated.	To be in accordance with the utility owner's protocols.	Contractor/ Consultant (Construction Inspection)
S68	Existing utilities/municipal infrastructure at Allandale GO Station	The four storm sewers, telecom and unknown utility crossings may be affected by the GO Station improvements;	• Mitigation measures will be further reviewed prior to the construction phase. • The telecom and unknown utility crossings will be protected in place during construction.	Consultant (Detailed Design)/ Contractor	No net effects anticipated.	To be in accordance with the utility owner's protocols.	Contractor/ Consultant (Construction Inspection)
Social and Built Environment – Operations and Maintenance							
S69	All Land Uses	Potential for nuisance effects (e.g., noise, vibration, dust, diminished air quality, and train whistling) resulting from an increased number and frequency of passing trains.	• Implement mitigation measures related to noise, vibration and air quality as described in the Air Quality Study and the Noise and Vibration Impact Assessment, provided in Appendices G and H, respectively. • The use of electric trains on this corridor in the future will reduce air quality effects. • Further mitigation to reduce noise effects will be developed as part of the detailed design phase, as required, based on noise modelling and projections. • Train operations will be carried out in accordance with applicable regulations and standards.	Metrolinx	The nuisance effects during operations/maintenance will be mitigated through compliance with regulatory requirements and identified noise, vibration and air quality mitigation measures. As such, net effects are predicted to be insignificant.	Metrolinx will continue its ongoing inspection program to monitor the effectiveness of its GO Transit operations. An existing complaints procedure is in place to address any concerns raised by neighbouring land owners, municipalities and/or the public.	Metrolinx
S70	All Land Uses	Potential for an increase to property values for properties located in close proximity to a GO Station due to an increase of transit service.	• No mitigation measures are required.	Not applicable.	Potential for an increase to property values for properties located in close proximity to a GO Station due to an increase of transit service, resulting in a positive net effect.	No monitoring activities are required.	Not applicable.
S71	Recreational Land Uses	Expanded use of trails to access GO Stations.	• The Town of East Gwillimbury and City of Barrie have identified specific needs to improve trail access to the East Gwillimbury GO Station and Barrie South GO Station, respectively. Other	Metrolinx	Trail connections and improvements will provide enhanced non-vehicle access	Metrolinx will continue its ongoing inspection program	Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			municipalities have also identified a need to reduce access to GO Stations by cars and increase trail access. • Metrolinx in consultation with the Town of East Gwillimbury will investigate the possibility of trail access to the East Gwillimbury GO Station from the Nokiidaa Bike Trail throughout the detailed design and prior to construction. • Metrolinx will work with the City of Barrie prior to construction to investigate the possibility of a trail connecting the Barrie South GO Station to the new developments to the east of the corridor. • Metrolinx will work with other municipalities prior to construction and beyond to improve trail access to all GO Stations, where feasible.		to the transit system and will therefore reduce road traffic, resulting in a positive net effect.	to monitor the effectiveness of its GO Transit operations. An existing complaints procedure is in place to address any concerns raised by neighbouring land owners, municipalities and/or the public.	
S72	Air Quality of Lands Adjacent to GO Station Improvements	Air emissions from combustion engines of passenger vehicles in station parking lots. Fugitive dust emissions from vehicles travelling within the parking lot and adjacent driveways.	• Operations and maintenance will be carried out in accordance with applicable regulations and standards, including Ontario's AAQC (PIBS#6570e01) (MOECC, 2012). • Erecting signs that encourage people to turn their vehicles off rather than idling for long periods of time. • Improved walkways and trail connections to potentially reduce the amount of cars and corresponding emissions in parking lots by encouraging walking and cycling instead of driving to the stations. • Dust emissions from the site will be minimized by cleaning the roadways and parking lots from time to time.	Metrolinx	Air emissions from vehicles in parking lots and adjacent driveways will be minimized to the extent possible through improved access for pedestrians and cyclists, signs targeted at reducing idling, and periodic cleaning of driving surfaces.	Metrolinx and GO Transit have ongoing inspection schedules to monitor the effectiveness of their operations. An existing complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.	Metrolinx
S73	Acoustic Environment of Lands Adjacent to GO Station Improvements	Noise assessment indicates that the Adjusted Noise Impacts at the sensitive receptors near GO Stations exceed the 5 dB criteria due to	• The model assessed eight and nine noise barriers, for Future, Scenarios 1 and 2 respectively, and found that noise barriers were	Detailed Design Consultant	Noise impacts from operations do not affect the York University, future	Metrolinx and GO Transit have ongoing inspection schedules to monitor the	Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		increased train traffic at the following GO Stations: Future, Scenario 1: future GO Station at Caledonia and existing stations at Rutherford, Maple, King City, Aurora, and Newmarket. Future, Scenario 2: future GO Station at Caledonia and existing stations at Rutherford, Maple, King City, Aurora, and Newmarket.	technically feasible for Scenarios 1 and 2 for the following GO Stations: • Future Caledonia, and existing Rutherford, Maple, King City, and Newmarket GO Stations.		Downsview Park, East Gwillimbury, Bradford, Barrie South and Allandale Waterfront GO Stations. No net effects expected at Future Caledonia, existing Rutherford, Maple, King City, and Newmarket GO Stations. Noise mitigation at the Aurora GO Station requires measures that may not be technically or economically feasible. An assessment to address this net effect will be conducted as part of the detailed design.	effectiveness of their operations. A complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.	
S74	Vibrational Environment of Lands Adjacent to the GO Station Improvements	The potential vibration effects are within the acceptable ranges of the MOECC/GO Draft Protocol.	• Mitigation is not required as the potential vibration effects are expected to be within the acceptable limits established in the MOECC/GO Draft Protocol.	Not applicable.	Adjacent building occupants may experience more frequent vibration. Vibration effects are generally expected to be within 0.14 mm/s, or less than 25% above the objective level, which is within the acceptable limits established in the MOECC/GO Draft	Metrolinx and GO Transit have ongoing inspection schedules to monitor the effectiveness of their operations. An existing complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.	Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
					Protocol, at the majority of locations.		
S75	Rutherford GO Station	Need for increased parking and associated improvements to the road access to the station.	• Parking and station access will be assessed as part of the update to the 2013 GO Transit Rail Parking and Station Access Plan. • Provide additional bicycle parking to respond to demand, as required.	Metrolinx	With the implementation of the updated GO Transit Rail Parking and Station Access Plan, the effects to parking and station access will be minimized.	Monitor parking utilization (both vehicular and bicycle) and station access operations.	Metrolinx
S76	Rutherford GO Station	Need for improved transit connections to the station.	• No mitigation measures are required by Metrolinx.	Not applicable.	No net effect to transit system is anticipated, assuming the Region implements the improvements identified in the TIA provided in Appendix I of this EPR.	No monitoring activities are required. Keep informed of York Region and City of Vaughan future plans for transit improvements and provide feedback related to station access, if necessary.	Metrolinx
S77	Rutherford GO Station	Need for improvements to active transportation (pedestrian/cyclist) linkages to the station.	• Investigate options for direct pedestrian access from Rutherford Road to the station platform.	Metrolinx	No net effect to active transportation linkages is anticipated, assuming additional facilities are implemented.	No monitoring activities are required. Keep informed of York Region and City of Vaughan future plans for active transportation improvements and provide feedback related to station access, if necessary.	Metrolinx
S78	Maple GO Station	Need for increased parking and associated improvements to the road access to the station.	• Parking and station access will be assessed as part of the update to the 2013 GO Transit Rail Parking and Station Access Plan. • Provide additional bicycle parking to respond to demand, as required.	Metrolinx	With the implementation of the updated GO Transit Rail Parking and Station Access Plan, the effects to parking and station	Monitor parking utilization (both vehicular and bicycle) and station access operations.	Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
					access will be minimized.		
S79	Maple GO Station	Need for improved transit connections to the station.	• Consider implementing a bus loop off of Hill Street to better service the GO Station.	Metrolinx	No net effect to transit system is anticipated, assuming the Region implements its higher order transit system in this area.	No monitoring activities are required. Keep informed of York Region future plans for transit improvements and provide feedback related to station access, if necessary.	Metrolinx
S80	Maple GO Station	Need for improvements to active transportation (pedestrian/cyclist) linkages to the station.	• No mitigation measures are required by Metrolinx. • Promote active transportation and encourage the City of Vaughan and York Region to continue to implement improvements to active transportation linkages in the study area.	Metrolinx	No net effect to active transportation linkages anticipated, assuming additional facilities are developed as planned.	No monitoring activities are required. Keep informed of York Region and City of Vaughan future plans for active transportation improvements and provide feedback related to station access, if necessary.	Metrolinx
S81	King City GO Station	Need for increased parking and associated improvements to the road access to the station.	• Parking and station access will be assessed as part of the update to the 2013 GO Transit Rail Parking and Station Access Plan. • Provide additional bicycle parking to respond to demand, as required.	Metrolinx	With the implementation of the updated GO Transit Rail Parking and Station Access Plan, the effects to parking and station access will be minimized.	Monitor parking utilization (both vehicular and bicycle) and station access operations.	Metrolinx
S82	King City GO Station	Need for improved transit connections to the station.	• No mitigation measures are required by Metrolinx. • Encourage York Region Transit (YRT) to consider enhancements to the service level on existing transit routes to improve transit connections to the station.	Metrolinx	No net effect anticipated, assuming improvements to transit connections are implemented as necessary.	No monitoring activities are required. Keep informed of York Region future plans for transit improvements and provide feedback related to station access, if necessary.	Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
S83	King City GO Station	Need for improvements to active transportation (pedestrian/cyclist) linkages to the station.	• No mitigation measures are required by Metrolinx. • Promote active transportation and encourage York Region and King Township to continue to develop improved cycling and pedestrian facilities.	Metrolinx	No net effect to active transportation linkages anticipated, assuming additional facilities are developed as planned.	No monitoring activities are required. Keep informed of York Region and King Township future plans for active transportation improvements and provide feedback related to station access, if necessary.	Metrolinx
S84	Aurora GO Station	Need for increased parking and associated improvements to road access to the station.	• Parking and station access will be assessed as part of the update to the 2013 GO Transit Rail Parking and Station Access Plan. • Provide additional bicycle parking to respond to demand, as required.	Metrolinx	With the implementation of the updated GO Transit Rail Parking and Station Access Plan, the effects to parking and station access will be minimized.	Monitor parking utilization (both vehicular and bicycle) and station access operations.	Metrolinx
S85	Aurora GO Station	Need for improved transit connections to the station.	• No mitigation measures are required by Metrolinx. • Encourage York Region to consider enhancing bus service connections to the GO Station from neighbourhoods in the study area and implement the planned frequent transit network on Wellington Street East and on Bayview Avenue.	Metrolinx	No net effect anticipated, assuming improvements to transit connections are implemented as necessary.	No monitoring activities are required. Keep informed of York Region future plans for transit improvements and provide feedback related to station access, if necessary.	Metrolinx
S86	Aurora GO Station	Need for improvements to active transportation (pedestrian/cyclist) linkages to the station.	• No mitigation measures are required by Metrolinx. • Promote active transportation and encourage York Region and the Town of Aurora to continue to develop improved cycling and pedestrian facilities.	Metrolinx	No net effect to active transportation linkages, assuming additional facilities are developed as planned.	No monitoring activities are required. Keep informed of York Region and Town of Aurora future plans for active transportation improvements and provide feedback related to station access, if necessary.	Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
S87	Newmarket GO Station	Need for increased parking and associated improvements to road access to the station.	• Parking and station access will be assessed as part of the update to the 2013 GO Transit Rail Parking and Station Access Plan. • Provide additional bicycle parking to respond to demand, as required. • Coordinate with the Town of Newmarket about their assessment of a new local road connection to the GO Station from Main Street North (requires overpass of Barrie rail corridor).	Metrolinx	With the implementation of the updated GO Transit Rail Parking and Station Access Plan, the effects to parking and station access will be minimized. Risk of access disruption will remain high until a second access can be provided to the station lands.	Monitor parking utilization (both vehicular and bicycle) and station access operations. Continue to monitor status of new local road connection to GO Station.	Metrolinx
S88	Newmarket GO Station	Need for improved transit connections to the station.	• No mitigation measures are required by Metrolinx. • Encourage YRT to consider more direct bus routes to the station to serve some of the residential subdivisions in the area.	Metrolinx	No net effect to transit system is anticipated, considering the availability of higher order transit in this area.	No monitoring activities are required. Keep informed of future York Region plans for transit improvements and provide feedback related to station access, if necessary.	Metrolinx
S89	Newmarket GO Station	Need for improvements to active transportation (pedestrian/cyclist) linkages to the station.	• No mitigation measures are required by Metrolinx. • Promote active transportation and encourage York Region and the Town of Newmarket to continue to develop improved cycling and pedestrian facilities.	Metrolinx	No net effect to active transportation linkages, assuming additional facilities are developed as planned.	No monitoring activities are required. Keep informed of York Region and Town of Newmarket future plans for active transportation improvements and provide feedback related to station access, if necessary.	Metrolinx
S90	East Gwillimbury GO Station	Need for increased parking and associated improvements to road access to the station.	• Parking and station access will be assessed as part of the update to the 2013 GO Transit Rail Parking and Station Access Plan.	Metrolinx	With the implementation of the updated GO Transit Rail Parking and Station Access	Monitor parking utilization (both vehicular and bicycle) and station access operations.	Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• Provide additional bicycle parking to respond to demand, as required. • Encourage the Town of East Gwillimbury and York Region to continue to petition the MTO to facilitate implementation of the Highway 400/404 Link (Bradford Bypass) to divert traffic away from this area.		Plan, the effects to parking and station access will be minimized.	Monitor status of Highway 400/404 Link (Bradford Bypass) project.	
S91	East Gwillimbury GO Station	Need for improved transit connections to the station.	• No mitigation measures are required by Metrolinx. • Encourage the Region to implement their planned rapid transit corridor/frequent transit route on Green Lane in the study area.	Metrolinx	No net effect anticipated assuming planned transit improvements are implemented.	No monitoring activities are required. Keep informed of York Region future plans for transit improvements and provide feedback related to station access, if necessary.	Metrolinx
S92	East Gwillimbury GO Station	Need for improvements to active transportation (pedestrian/cyclist) linkages to the station.	• No mitigation measures are required by Metrolinx. • Consider further access connections to the station from the Nokiidaa Bike Trail, Main Street North and the Haines Road residential subdivision.	Metrolinx	No net effect to active transportation linkages, assuming additional facilities are developed. If improved connections are not made, ridership will be constrained for these access modes.	No monitoring activities are required. Keep informed of York Region and Town of East Gwillimbury future plans for active transportation improvements and provide feedback related to station access, if necessary.	Metrolinx
S93	Bradford GO Station	Need for increased parking and associated improvements to road access to the station.	• Parking and station access will be assessed as part of the update to the 2013 GO Transit Rail Parking and Station Access Plan. • Provide additional bicycle parking to respond to demand, as required. • Coordinate with the Town for consideration of implementing signalization and the addition of a westbound left-turn lane at Dissette Street/GO Station access north. • Encourage the Town of Bradford West Gwillimbury to continue to petition the MTO to	Metrolinx	With the implementation of the updated GO Transit Rail Parking and Station Access Plan, the effects to parking and station access will be minimized.	Monitor parking utilization (both vehicular and bicycle) and station access operations. Monitor status of Highway 400/404 Link (Bradford Bypass) project.	Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			facilitate implementation of the Highway 400/404 Link (Bradford Bypass) to divert traffic away from Bridge Street.				
S94	Bradford GO Station	Need for improved transit connections to the station.	• No mitigation measures are required by Metrolinx. • Encourage the Town of Bradford West Gwillimbury to consider improving transit connections to the Bradford GO Station.	Metrolinx	No net effect anticipated, assuming improvements to transit connections are implemented as necessary.	No monitoring activities are required. Keep informed of future Town of Bradford West Gwillimbury plans for transit improvements and provide feedback related to station access, if necessary.	Metrolinx
S95	Bradford GO Station	Need for improvements to active transportation (pedestrian/cyclist) linkages to the station.	• Coordinate with the Town of Bradford West Gwillimbury to implement planned cycling routes in the areas immediately surrounding the station.	Metrolinx	No net effect to active transportation linkages, assuming additional facilities are developed as planned.	No monitoring activities are required. Keep informed of future Town of Bradford West Gwillimbury plans for active transportation improvements and provide feedback related to station access, if necessary.	Metrolinx
S96	Barrie South GO Station	Need for increased parking and associated improvements to road access to the station.	• Parking and station access will be assessed as part of the update to the 2013 GO Transit Rail Parking and Station Access Plan. • Provide additional bicycle parking to respond to demand, as required.	Metrolinx	With the implementation of the updated GO Transit Rail Parking and Station Access Plan, the effects to parking and station access will be minimized.	Monitor parking utilization (both vehicular and bicycle) and station access operations.	Metrolinx
S97	Barrie South GO Station	Need for improved transit connections to the station.	• No mitigation measures are required by Metrolinx. • Encourage the City of Barrie to continue to monitor transit operations serving the GO Station and implement planned transit	Metrolinx	No net effect to transit system, assuming transit routes are developed as planned.	No monitoring activities are required. Keep informed of future City of Barrie plans for transit improvements and provide	Metrolinx

Impact ID	Feature/ Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			connections to service the Hewitt's Secondary Plan area.			feedback related to station access, if necessary.	
S98	Barrie South GO Station	Need for improvements to active transportation (pedestrian/cyclist) linkages to the station.	• No mitigation measures are required by Metrolinx. • Promote active transportation and encourage the City of Barrie to implement planned buffered bicycle lanes on Yonge Street and Mapleview Drive, and additional active transportation linkages to Hewitt's Secondary Plan area.	Metrolinx	No net effect to active transportation linkages, assuming additional facilities are developed as planned.	No monitoring activities are required. Keep informed of future City of Barrie plans for active transportation improvements and provide feedback related to station access, if necessary.	Metrolinx
S99	Allandale Waterfront GO Station	Need for increased parking and associated improvements to road access to the station.	• Parking and station access will be assessed as part of the update to the 2013 GO Transit Rail Parking and Station Access Plan. • Provide additional bicycle parking to respond to demand, as required.	Metrolinx	With the implementation of the updated GO Transit Rail Parking and Station Access Plan, the effects to parking and station access will be minimized.	Monitor parking utilization (both vehicular and bicycle) and station access operations. Coordinate with the City of Barrie to review Traffic Impact Study for future development adjacent to the GO Station and confirm that acceptable traffic operations are maintained to the station.	Metrolinx
S100	Allandale Waterfront GO Station	Need for improvements to active transportation (pedestrian/cyclist) linkages to the station.	• No mitigation measures are required by Metrolinx. • Promote active transportation and encourage the City of Barrie to continue plan for active transportation linkages serving the GO Station.	Metrolinx	No net effect to active transportation linkages, since ridership growth at station is forecasted to be low.	No monitoring activities are required. Keep informed of future City of Barrie plans for active transportation improvements and provide feedback related to station access, if necessary.	Metrolinx
S101	Existing utilities/municipal infrastructure within the GO Station ROW.	No effects anticipated from operations or maintenance activities.	• No mitigation measures are required.	Not applicable.	No net effects anticipated.	No monitoring activities are required.	Not applicable.

Table 4-21: Impact Assessment, Mitigation Measures, Net Effects, and Monitoring Activities Summary Table – Proposed Bradford Layover Facility

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
Natural Environment – Pre-Construction land Clearing/Property Acquisition							
L1	Human-made Wetland, Wildlife Habitat and Species at Risk	An entire human-made wetland will be removed. The wetland is a square-shaped depression created through grading. It could potentially provide habitat for Blanding's Turtles, King Rail and Least Bittern.	• A qualified Environmental Inspector is required throughout the construction period to confirm that protection measures are implemented, maintained and enforced. • Species-specific site investigations will be undertaken prior to the construction phase. If any Endangered or Threatened Species are found, compensation will be provided as required under the ESA, 2007. • Compensation will be developed in conjunction with the MNRF through the permitting and/or registration process. • If Endangered or Threatened Species are not found, removal of the wetland will be addressed through the Vegetation Compensation Protocol for Metrolinx RER Projects to be developed in consultation with agencies.	Metrolinx/Consultant (Detailed Design)	If the habitat is confirmed to be significant, compensation will be provided in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects. The wetland is human-made and relatively young with a lack of diversity. As such, it is expected that any compensation would result in a higher quality wetland with a greater wildlife habitat function.	If Endangered or Threatened Species are found in the wetland, Monitoring Activities will be developed in accordance with any registration and/or permitting requirements under the ESA, 2007. If no Endangered or Threatened Species are found, the following monitoring will be applied: An 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. The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.	Contractor/Consultant (Environmental Inspector)
L2	Human-made Wetland, Wildlife Habitat and Species at Risk	A cultural thicket and portions of a cultural meadow will be removed. They are in a state of early succession and could potentially provide habitat for Shrub/Early Successional Breeding Birds and the provincially Threatened Eastern Meadowlark.	• Species-specific site investigations will be undertaken as part of the detailed design process. If Eastern Meadowlark is found compensation will be provided as required under the ESA, 2007. Compensation will be developed in conjunction with the MNRF through the permitting and/or registration process. • If Eastern Meadowlark is not found but the criteria for Significant Shrub/Early Successional	Metrolinx/Consultant (Detailed Design)	If the habitat is confirmed to be significant, compensation will be provided in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects. The meadow and thicket community is disturbed and includes a high number of non-native and	If Endangered or Threatened Species are found in the wetland, Monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA, 2007. If no Endangered or Threatened Species are	Contractor/Consultant (Environmental Inspector)

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			Bird Breeding Habitat is met, the removal of habitat will be addressed through the Vegetation Compensation Protocol for Metrolinx RER Projects to be developed in consultation with agencies.		invasive species. As such, it is expected that any compensation would result in a higher quality meadow habitat with a greater wildlife habitat function.	found, the following monitoring will be applied: An 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. The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.	
L3	Nests of Migratory Birds	Nests could be harmed or destroyed as a result of vegetation clearing. This is in contravention of the MBCA, 1994.	• Any vegetation clearing will take place outside of the breeding bird timing window, generally from April 1 - to August 31. • 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 Ecologist confirms that the birds have fledged and the nest is no longer active. • If a nesting migratory bird (or SAR protected under ESA, 2007) is identified within or adjacent to the construction site, all activities will stop and the Contractor (with assistance from a qualified Ecologist/Avian Biologist) shall discuss mitigation measures with Metrolinx - Environment Program and Assessment Department staff. In addition, Metrolinx will consult the MNRF and ECCC to discuss applicable mitigation options. The Contractor will proceed based on the mitigation measures	Metrolinx/Consultant (Environmental Inspector)/ Contractor	Construction activities will be carried out to avoid injury to wildlife. Any wildlife inadvertently injured as a result of construction activities will be limited to a very small number of individuals that will not affect species at the population level. Tree removals will be limited within breeding bird timing windows. As such, no net effects are anticipated.	An Environmental Inspector will regularly monitor construction to confirm that activities do not encroach into nesting areas or disturb active nesting sites.	Consultant (Environmental Inspector)

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			established through discussions with Metrolinx, the MNRF and/or ECCC.				
Natural Environment – Construction							
L4	Provincially Significant Wetland and Fish Habitat	Grading and soil disturbance during construction could lead to erosion and sedimentation to the adjacent provincially significant Holland Marsh Wetland Complex and tributary of the West Holland River. This could affect the quality of habitat, disturb ground vegetation and negatively affect the quality of fish habitat.	• A qualified Environmental Inspector is required throughout the construction period to confirm that protection measures are implemented, maintained and enforced. • 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. ESC and Dewatering Plans will be developed prior to construction in consultation with the TRCA and LSRCA 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). • 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. • ESC and dewatering measures will be implemented prior to construction and maintained during the construction phase in accordance with the ESC and Dewatering Plans. • If the ESC or dewatering measures are not functioning properly, no further work in the affected areas will occur until the problem is addressed.	Contractor/Consultant (Detailed Design)	Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.	An Environmental Inspector will conduct regular inspections to confirm ESC and dewatering measures are functioning properly and are properly maintained throughout the construction phase.	Consultant (Environmental Inspector)

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• All disturbed areas of the construction site will be stabilized and re-vegetated as soon as conditions allow. • ESC measures will be left in place until all areas of the construction site have been stabilized and will then be removed. • Wet weather restrictions shall be applied during site preparation and excavation. Work will be avoided near watercourses during periods of excessive precipitation and/or excessive snow melt. • A Construction Emergency Response and Communications Plan will be developed prior to construction and followed throughout the construction phase (includes spill response plans).				
L5	Provincially Significant Wetland and Fish Habitat	There is potential for spills of fuels or other hazardous materials to occur during fueling of construction equipment or other construction activities. The can affect groundwater quality and the health of vegetation and wildlife within natural areas.	• 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. 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. • The Contractor will develop spill prevention and contingency plans and have them in place prior to construction of the BRCE 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 watercourses will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency	Contractor	Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.	An Environmental Inspector is required to inspect and confirm ESC measures are functioning properly and are properly maintained throughout the construction phase. Workers will report any instances of spills to their supervisors.	Consultant (Environmental Inspector)

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			plan. Spills will be reported to the Ontario Spills Action Centre at 1-800-268-6060.				
L6	Provincially Significant Wetland and Fish Habitat	Dewatering required during the construction of any deep foundations or footings or other below-ground (sub-surface) works has the potential to affect groundwater levels, wetland water levels and the hydrology of other natural features.	• All requirements under the OWRA, R.S.O. 1990, c. O.40 with respect to the quality of water discharging into natural receivers will be met, including the following mitigation measures and best practices: • 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. • If significant changes in water levels/seepage areas are noted, operations will cease until water levels recover.	Contractor	All dewatering will be conducted in accordance with regulatory requirements. As such, no net effects are anticipated.	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 confirm that no sediment is entering significant natural features or watercourse.	Consultant (Environmental Inspector)
L7	Provincially Significant Wetland	Dust created as a result of construction has the potential to settle on adjacent vegetation, disturbing wildlife and their habitat.	• Dust from the work areas will be controlled through suppressants (e.g., water).	Contractor	All effects are expected to be temporary, thus no net effects are anticipated.	An Environmental Inspector will regularly inspect dust emissions during construction to confirm dust control watering frequency and rates are adequate.	Consultant (Environmental Inspector)
L8	Provincially Significant Wetland	Stockpiled materials, equipment or construction activities could accidentally encroach into natural areas beyond the proposed property limits. This could add to the disturbance to natural features and increase the quantity lost as a result of the BRCE Project. Soils beyond the proposed property limits could also become compacted or disturbed if activities extend beyond approved limits.	• 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 Plan will outline a process of resolving issues of extended encroachment, including clean-up, maintenance of ESC measures, and consideration of alternative ESC measures. • A Construction Emergency Response and Communications Plan will be developed prior to construction and followed throughout the construction phase (includes spill response plans).	Contractor/Consultant (Detailed Design)	Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.	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.	Consultant (Environmental Inspector)

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
L9	Provincially Significant Wetland	Any disturbance to lands and vegetation clearing has the potential to allow invasive species to be introduced and spread through natural areas. Invasive species can prevent other native species from re-establishing.	• All disturbed areas of 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; and prior to construction. • If extensive invasion of non-native species is identified as a result of the BRCE Project, contingency measures may include an applicable herbicide application. A herbicide application plan will be developed as required and submitted to the applicable conservation authority for review.	Contractor	Metrolinx will work in accordance with the requirements of the Invasive Species Act. Thus, no net effects are anticipated.	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% survival rate and confirm that non-native and invasive species are not becoming pervasive as a result of the BRCE Project, unless otherwise specified within the Vegetation Compensation Protocol for Metrolinx RER Projects.	Consultant (Environmental Inspector)
L10	Fish Habitat	In order to accommodate the layover facility, the watercourse through the centre of the site will need to be relocated.	• The watercourse will be relocated in accordance with all Fisheries Act requirements. Specific mitigation measures and permitting requirements will be identified in the Aquatic Habitat Assessment Report to be prepared prior to the construction phase. The watercourse is regulated by the LSRCA. Although Metrolinx is not required to meet LSRCA regulations, all plans associated with this watercourse will be sent to LSRCA for voluntary review with the intent of meeting the spirit of regulatory requirements.	Metrolinx/Contractor	All requirements under the Fisheries Act will be met, thus no net effects are anticipated.	Monitoring activities will be developed in the Aquatic Habitat Assessment Report to be prepared prior to the construction phase. A monitoring program will be developed to meet all requirements of the Fisheries Act and any permit or approval conditions.	Consultant (Environmental Inspector)
L11	Tree Removal	Trees present within the proposed development envelope will require removal. The approximate removals	• Metrolinx will coordinate compensation with public agencies through implementation of the	Metrolinx/Contractor	Reduced on-site tree canopy but overall increase in number of	Monitor success and tend to new plantings in accordance with the Vegetation	Contractor/ Consultant (Environmental Inspector)

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		based on field investigations are as follows: Total Existing ROW Tree Removal (estimated) 0 Total Expanded ROW Tree Removal (estimated) 31 Impacts to trees adjacent to the work zone may result in unintended root damage or tree felling.	Vegetation Compensation Protocol for Metrolinx RER Projects.		trees in landscape through off-site planting.	Compensation Protocol for Metrolinx RER Projects.	
			• An assessment of trees within and on lands immediately adjacent to the layover facility to be completed prior to the construction phase to determine required setbacks and protection measures.	Consultant (Detailed Design – Certified Arborist)	No net effects are anticipated.	Conduct a post-construction assessment of trees to determine if injuries to the preserved trees have occurred or their health and/or structure has deteriorated. Where deterioration or injury has occurred, identify and implement any necessary pruning, mitigation or removal of trees by a Certified Arborist.	Consultant (Certified Arborist)
			• TPZs to be implemented on retained trees through construction of barriers.	Contractor/ Consultant (Environmental Inspector)	No net effects are anticipated.	Monitor construction by contractors for unauthorized encroachment into vegetated areas and TPZs. Monitor silt fencing and/or tree protection barrier to confirm proper installation and functionality.	Consultant (Environmental Inspector)
			• Inspect layover facility site and adjacent lands for hazardous limbs and trees for removal prior to commencement of use of the layover facility.	Consultant (Certified Arborist)	No net effects are anticipated.	Inspections will identify dead trees or limbs adjacent to layover facility.	Consultant (Certified Arborist)
Natural Environment – Operations and Maintenance							
L12	Provincially Significant Wetland and Fish Habitat	Spills of fuel and other hazardous materials 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.	• An Emergency Response and Communications Plan will be developed and followed throughout the operations and maintenance phase (includes spill response plans): • Metrolinx will develop spill prevention and contingency plans for the BRCE 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.	Metrolinx/Contractor (Maintenance)	Any inadvertent damage is likely to be highly localized and will be immediately addressed. Damaged areas will be returned to their previous condition. As such, no net effects are anticipated.	Layover staff and maintenance contractors are responsible for reporting spills and other issues and ensuring their timely resolution.	Metrolinx/ Contractor (Maintenance)

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• Hazardous material and fuel storage, refueling and maintenance of equipment will occur within designated areas only. • Spills or depositions into watercourses or 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.				
L13	Tree Removal	Deterioration of trees' vitality over time that are adjacent to the Bradford Layover Facility.	• Pruning or removal of trees to prevent woody material from falling on the Bradford Layover Facility lands or Barrie rail corridor.	Metrolinx Consultant (Certified Arborist)	No net effects are anticipated.	Inspect and assess trees on-site and on adjacent lands annually (at minimum).	Metrolinx Consultant (Certified Arborist)
Cultural Environment - Construction							
L16	Archaeological Resources	There are no direct effects anticipated to archaeological resources resulting from construction of the Bradford Layover Facility.	• No mitigation measures are required. • In the event that previously undocumented archaeological remains are found during construction activities, the proponent or person discovering the archaeological resources will cease alteration of the site immediately, and the Consultant Archaeologist, approval authority, and the Cultural Programs Unit of the MTCS will be immediately notified. • In the event that human remains are discovered, the person discovering the human remains will also immediately notify the police or coroner.	Not applicable.	No net effects anticipated	The Consultant (Environmental Inspector) shall monitor land-disturbing construction activities to confirm they remain within the study area. Any site personnel responsible for or encountering land-disturbing construction activities shall be informed of their responsibilities in the event that an archaeological resource is encountered during construction.	Consultant (Environmental Inspector)/ Contractor/ Metrolinx
L17	Cultural Heritage Resources	There are no effects anticipated to CHRs resulting from construction of the Bradford Layover Facility.	• No mitigation measures are required.	Not applicable.	No net effects anticipated.	No monitoring activities are required.	Not applicable.
Cultural Environment – Operations and Maintenance							
L18	Archaeological Resources	Upon completion of construction, no potential effects related to	• No mitigation measures are required.	Not applicable.	No net effects anticipated.	No monitoring activities are required.	Not applicable.

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		archaeological resources are anticipated.					
L19	Cultural Heritage Resources	There are no effects anticipated to CHRs resulting from operations and maintenance of the Bradford Layover Facility.	• No mitigation measures are required.	Not applicable.	No net effects anticipated.	No monitoring activities are required.	Not applicable.
Social and Built Environment – Pre-Construction Land Clearing/Property Acquisition							
L20	Commercial and Industrial Lands	Full property acquisition and displacement of 3 businesses and their associated buildings (Shor-Cais Foundation Contractors & Engineers Ltd., ServiceStar Freightways Inc., and Toromont Industries Ltd.), resulting in business loss and effects to existing employees. Full property acquisition of one vacant undeveloped property owned by Millford Development Ltd, resulting in loss of future development potential at this location. Partial property acquisition of one business (HomeLife/Aurora Realty Ltd.) which may limit future expansion potential, and parking area. Loss of value to the businesses and their employees impacted by land acquisition; Potential temporary job losses due to displacement of businesses during the relocation period.	• Metrolinx will meet with property/businesses owners to discuss and identify property impacts and rights to compensation and relocation. • Metrolinx to provide fair market value compensation to affected property owners in accordance with applicable laws. • Metrolinx will work collaboratively with the Town of Bradford West Gwillimbury to make a concerted effort to relocate the three affected businesses to a comparable location within the Town (e.g., Reagens Industrial Park).	Metrolinx	The effects to properties will be mitigated by providing fair market value compensation in accordance with applicable laws and through negotiations with affected property owners. Net effects are expected to be minimal (insignificant).	No monitoring activities are required.	Not applicable.
L21	Land Use Near Closed Landfill	Property within 500 metres of an existing closed landfill will need to be acquired. Potential effects on the Bradford Layover Facility may include ground and surface water contamination by	• In keeping with Guideline D-4 Land Use On or Near Landfills and Dumps (MOE, 1994), Metrolinx will complete an assessment to determine the potential impacts on the land use, and will detail any required mitigation measures.	Metrolinx	To be determined following completion of the Guideline D-4 assessment.	To be determined following completion of the Guideline D-4 assessment.	To be determined following completion of the Guideline D-4 assessment.

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		leachate, surface runoff, ground settlement, visual impact, soil contamination and hazardous waste, and landfill- generated gases.					
Social and Built Environment - Construction							
L22	Commercial and Industrial Lands	Temporary nuisance effects to surrounding properties due to increased noise, vibration, dust, and diminished air quality, for example.	• Implement mitigation measures related to noise, vibration and air quality as described in the Air Quality Study and the Noise and Vibration Impact Assessment, provided in Appendices G and H, respectively.	Contractor	The temporary nuisance effects will be mitigated through compliance with regulatory requirements and identified noise, vibration, and air quality mitigation measures and implementation of construction BMPs to the extent practical. As such, net effects are predicted to be insignificant.	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.	Contractor/Consultant (Environmental Inspector)
L23	Vehicle, Pedestrian, Cyclist, and Agricultural Traffic	Temporary road or lane closures necessary for construction may affect access to other businesses, local transit routes and farm operations in the area.	• Prepare site-specific Traffic Control and Management Plans prior to construction and implement during 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.	Consultant (Detailed Design)/ Metrolinx	The temporary restrictions to access points will be minimized to the extent practical. As such, net effects are predicted to be insignificant.	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.	Contractor/Consultant (Environmental Inspector)
L24	Air Quality of Lands Adjacent to Bradford Layover Facility	Fugitive dust emissions resulting from: Soil excavation and filling activities. Demolition of structures. Stockpiling of soil and other friable construction materials. Transportation of friable fill materials via dump trucks.	• Dust suppression measures as needed to control fugitive dust emissions in accordance with the Cheminfo Services Inc. March 2005 publication Best Practices for the Reduction of Air Emissions From Construction and Demolition Activities. • Concrete saws with water control will be used wherever possible. • Stockpiling of soil and other friable materials in locations that are less exposed to wind.	Contractor	Potential air quality effects are expected to be temporary and localized to the areas adjacent to the facility. Effects reduced through implementation of construction BMPs.	Environmental Inspector to frequently check the effectiveness of construction BMPs to confirm they are functioning as intended. In the event that mitigation is found to not be effective, the Contractor will be notified to implement revised mitigation measures designed to improve effectiveness.	Consultant (Environmental Inspector) and Contractor

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		Emissions resulting from the combustion engines of construction equipment.	• Use of dump trucks with retractable covers for the transport of friable fill materials. • Use of deconstruction methods in lieu of demolition where feasible. • Minimized drop heights and use of enclosed chutes and cover bins for debris associated with deconstruction of affected structures. • Washing of equipment and/or use of mud mats where practical at construction site exits to limit the migration of soil and dust off-site. • Use of ESC measures such as silt fence and erosion control blankets to address areas with temporary unstabilized soil. • Permanent stabilization of exposed soil areas with non-erodible material (e.g., stone or vegetation) as soon as practicably possible after construction in the affected area is complete. • Ensuring that all construction vehicles, machinery, and equipment are equipped with current emission controls, and in a state of good repair.			Dust levels will be monitored daily by the Contractor and frequently by the Environmental Inspector to assess the effectiveness of dust suppression measures, and make adjustments 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. The Contractor will establish a complaint response protocol for nuisance effects such as dust.	
L25	Acoustic Environment of Lands Adjacent to the Existing Barrie and Proposed Bradford Layover Facilities	No construction activities are occurring at the existing Barrie Layover Facility as part of the BRCE Project. Construction activities associated with the proposed Bradford Layover Facility likely to cause potential noise effects generally include: Demolition of existing structures. Breaking of asphalt and concrete through the use of hydraulic hammers or jack hammers. Soil excavation, grading, compaction, and pile driving.	• Construction BMPs will be implemented to minimize any adverse effects from construction noise at nearby sensitive receptors. These measures will include, but not be limited to the mitigation measures described for the construction of the proposed rail infrastructure. • 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. • 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	Contractor/Metrolinx	Construction related impacts will be minimized through implementation of construction BMPs. Thus, no net effects are anticipated.	Construction activities will be monitored by a qualified Environmental Inspector who will check and confirm the effectiveness of construction BMPs employed to minimize any adverse effects from construction noise at nearby sensitive receptors. This includes, but is not limited to, the monitoring measures described for the construction of the new rail infrastructure.	Consultant (Environmental Inspector) and Contractor

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
		Track installation.	activities. Notification of nighttime construction will be provided in advance.				
L26	Vibrational Environment of Lands Adjacent to the Bradford Layover Facility	Nuisance to adjacent building occupants resulting from construction activities causing vibrations, typically involving: Demolition of existing structures. Breaking of asphalt and concrete through the use of hydraulic hammers or jack hammers. Soil excavation, grading, compaction, and pile driving. Potential damage to adjacent property or infrastructure.	• Implement construction BMPs including but not limited to the following: • Deconstruction procedures in lieu of demolition for affected existing structures wherever feasible. • Refraining from the use of blasting. • Using saws to break up existing asphalt and concrete instead of hydraulic hammers or jack hammers, wherever possible and practical. • Using soil compaction techniques that minimize the need for dynamic compaction, or wherever dynamic compaction is necessary, making adjustments to minimize vibrations (e.g., using smaller falling weights). • Wherever feasible, design foundations for infrastructure that minimizes the need or extent of pile driving, and wherever pile driving is necessary, use methods that minimize vibrations (e.g., pre-drilling, switching impact with vibratory hammer, using augured cast-in-place piles, drilled shafts, etc.). • 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 vibration effects. Notification of nighttime construction will be provided in advance.	Contractor/Metrolinx	Adjacent building occupants may temporarily be subjected to increased vibration levels from construction activities. No damage to neighbouring property or infrastructure is anticipated.	Environmental Inspector to check the effectiveness of mitigation measures and construction BMPs to confirm they are functioning as intended. In the event that mitigation is found to not be effective, the Contractor will be notified to implement revised mitigation measures designed to improve effectiveness. In the event that the Contractor or Environmental Inspector notices or is made aware of property or infrastructure damage caused by construction vibration, the Contractor will immediately stop work in the area. The Contractor will develop a restoration plan in consultation with the property or infrastructure owner, and will complete the work using alternative methods to prevent further damage. The Contractor will establish a complaints response protocol for vibration effects.	Consultant (Environmental Inspector) and Contractor
L27	Surrounding Road Network	Traffic effects on surrounding road network due to construction access to the Layover site.	• Coordinate construction access requirements with the Town of Bradford West Gwillimbury including adequate construction hauling routes.	Consultant (Detailed Design)/Metrolinx	The potential effects on the road network will be minimized by the implementation of the site-specific Traffic Control and Management Plan.	Monitor the effectiveness of the Traffic Control and Management Plan.	Consultant (Construction Inspection)

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• Prepare a site-specific Traffic Control and Management Plan prior to construction to be implemented during construction.			Respond to any complaints in an effective and timely manner.	
L28	Existing utilities/municipal infrastructure within the Bradford Layover Facility site.	Existing servicing to the existing structures on the properties required for the Bradford layover will need to be decommissioned or modified to allow for the construction of the layover facility.	• Mitigation measures will be further reviewed prior to the construction phase for known utility/infrastructure crossings and utilities/infrastructure running along the corridor in coordination with the utility owner. The following mitigation measures will be considered in prior to the construction phase and implemented by the Contractor: • Protect the utilities/infrastructure left in place through barriers and other methods while construction occurs around them. • Relocation/remove utilities/infrastructure around the area of construction as required.	Consultant (Detailed Design)/ Contractor	No net effects anticipated.	To be in accordance with the utility/infrastructure owner's protocols.	Contractor/ Consultant (Construction Inspection)
Social and Built Environment – Operations and Maintenance							
L29	Commercial and Industrial Lands	Potential for nuisance effects to surrounding properties due to increased noise, vibration, dust, and diminished air quality, associated with train operations and maintenance at the facility.	• Implement mitigation measures related to noise, vibration and air quality as described in the Air Quality Study and the Noise and Vibration Impact Assessment, provided in Appendices G and H, respectively. • The use of electric trains on this corridor in the future will reduce air quality effects.	Metrolinx	The nuisance effects during operations will be mitigated through compliance with regulatory requirements and identified noise, vibration and air quality mitigation measures. As the Bradford Layover Facility is located within an existing industrial area, net effects are expected to be minimal.	Metrolinx will continue its ongoing inspection program to monitor the effectiveness of its GO Transit operations. An existing complaints procedure is in place to address any concerns raised by neighbouring land owners, municipalities and/or the public.	Metrolinx
L30	Air Quality of Lands Adjacent to Bradford Layover Facility	Air emissions from trains and facility maintenance vehicles and equipment.	• Operations and maintenance will be carried out in accordance with applicable regulations and standards, including Ontario's AAQC (PIBS#6570e01) (MOECC, 2012).	Metrolinx	Long-term emissions at the facility are expected to be minimal upon replacement of existing diesel locomotives with electric trains.	Metrolinx and GO Transit have ongoing inspection schedules to monitor the effectiveness of their operations.	Metrolinx

Impact ID	Feature/Location of Potential Effect	Description of Potential Effect	Mitigation Measure	Mitigation Responsibility	Net Effects	Monitoring Activity	Monitoring Responsibility
			• Maintenance vehicles and equipment will be equipped with current emission controls, and kept in a state of good repair. • Future replacement of diesel with electric trains.			An existing complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.	
L31	Acoustic Environment of Lands Adjacent to Existing Barrie and Proposed Bradford Layover Facilities	There will be no changes to the existing Barrie Layover Facility as part of the BRCE Project. Therefore, mitigation measures were not investigated. Noise impacts from the proposed Bradford Layover Facility are predicted to be below the applicable exclusion limit.	• For the existing Barrie Layover Facility and the proposed future Bradford Layover Facility no noise mitigation is required.	Not applicable.	There are no net effects associated with operations and maintenance of the proposed Bradford Layover Facility.	Metrolinx and GO Transit have ongoing inspection schedules to monitor the effectiveness of their operations. A complaints procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.	Metrolinx
L32	Vibrational Environment of Lands Adjacent to the Bradford Layover Facility	The GO Transit Adjacent Development Guidelines (2013) indicate that vibration effects become negligible beyond a setback of 75 metres. Potential vibration effects are therefore negligible as there are no sensitive receptors within 75 metres of the proposed Bradford Layover Facility (the closest being 505 metres away).	• Mitigation is not required as the potential vibration effects are expected to be negligible.	Not applicable.	No net effects are anticipated as the potential vibration effects are expected to be negligible.	Metrolinx and GO Transit have ongoing inspection schedules to monitor the effectiveness of their operations. An existing procedure is in place to address any concerns raised by neighbouring land owners, affected municipalities or the public.	Metrolinx
L33	Surrounding Road Network	Minor increase in traffic on the local road network and within the existing Artesian Industrial Park.	• No mitigation required to address minor traffic effects.	Not applicable.	No traffic-related net effects are anticipated.	No traffic-related monitoring required.	Not applicable.
L34	Existing utilities/municipal infrastructure within the Bradford Layover Facility site.	No effects anticipated from operations or maintenance activities.	• No mitigation measures are required.	Not applicable.	No net effects anticipated.	No monitoring activities are required.	Not applicable.

4.7 Environmental Mitigation and Monitoring Plan

An Environmental Mitigation and Monitoring Plan (EMMP) will be developed prior to construction. The EMMP will provide direction such that the implementation of the BRCE 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 4.7.1 and 4.7.2.

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 BRCE Project. The EMMP will be updated once the applicable permits and approvals are received for the BRCE Project, or the findings from the additional environmental studies are available.

The Contractor will be responsible to implement the requirements of the EMMP prior to/during construction. The Consultant shall provide environmental monitoring services and adhere to the reporting requirements as detailed in the EMMP, providing instruction to the design team and Contractor as required, and issuing preventive and/or corrective action requests as required. The EMMP will include a procedure for preventive and corrective action in the event of findings of non-compliance during environmental monitoring, as well as follow up and post-construction reporting procedures.

4.7.1 Matters of Provincial Importance

As prescribed in O. Reg. 231/08, the Minister of the Environment and Climate Change can take action in relation to the TPAP project if there is a potential for a negative impact on a matter of provincial importance that relates to the natural environment or has cultural heritage value or interest that that are related to constitutionally protected Aboriginal or Treaty Rights. Table 4-22 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, January 2014)), the BRCE Project definition of these matters and an indication of their relevance to the BRCE Project when assessing potential effects of the Project on matters of provincial importance. Table 4-22 is intended as a summary of 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 BRCE Project and the commitments made to confirm that the implementation of the BRCE Project does not result in negative impacts to matters of provincial importance.

4.7.2 Constitutionally Protected Aboriginal or Treaty Rights

As discussed in Section 5 of the BRCE EPR, Metrolinx has undertaken consultation with Indigenous communities that have expressed an interest in the BRCE Project. A meeting was held with representatives from the Alderville First Nation, Curve Lake First Nation, Hiawatha First Nation and Mississaugas of the Scugog Island First Nation on May 26, 2016. Further meetings were held with the Williams Treaties First Nations on July 18, 2016 and September 9, 2016, which was attended by seven member First Nations including the Beausoleil First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, Scugog Island First Nation, Alderville First Nation, Hiawatha First Nation and Curve Lake First Nation. During both meetings several Metrolinx projects including the BRCE Project were discussed.

Letters and emails were sent to all communities with invitations to the meetings. Correspondence was exchanged between Metrolinx and the Curve Lake First Nation, Huron-Wendat Nation, Mohawks of the Bay of Quinte and the Métis Nation of Ontario (MNO). Through concerns have been raised by some of these communities in relation to potential impacts to archaeological resources in the BRCE Project study area; the communities have not explicitly indicated concerns about the potential effects to constitutionally protected Aboriginal or Treaty Rights from the proposed rail expansion. Consultation will continue with these communities and any other community that indicates an interest in the BRCE Project throughout detailed design and prior to construction. Through ongoing consultation with Indigenous communities that have indicated an interest in the BRCE Project, Metrolinx will ascertain if there are any specific concerns about potential effects to any respective constitutionally protected Aboriginal or Treaty Rights.

Table 4-22: Matters of Provincial Importance

Matters of Provincial Importance[1]	Definition [2]	Applicability to the BRCE 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 BRCE study area.
Extirpated, Endangered, Threatened, or species of special concern and their habitat.	3) A SAR: Extirpated, Endangered, or Threatened species and their habitat. 4) 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 due to 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.	3) A Significant Wetland, Significant Woodland, Significant Valleyland or SWH as defined in Section 2.1.5 of the PPS (2014). 4) A Natural Area Abutting Lake Simcoe as defined in policy 6.21-DP of the LSPP.	There are portions of Significant Wetlands, Significant Woodlands, Significant Valleylands and SWH that will be removed as a part of the rail expansion. One Natural Area Abutting Lake Simcoe is present but will not be affected.
An area of natural or scientific interest (ANSI).	A Significant ANSI as defined in Section 2.1.5 of the PPS (2014).	There is one Significant ANSI and two Candidate ANSIs within the BRCE study area that may be affected by the BRCE Project.
A stream, creek, river or lake containing fish and their habitats.	A stream, creek, river or lake containing fish and their habitats.	There are a total of 46 watercourses that cross the BRCE rail corridor, of which 35 provide direct fish habitat and 11 provide indirect fish habitat. Two watercourses that cross through the BRCE rail corridor contain Redside Dace (fish SAR) habitat in the area of the crossing. One watercourse contains Redside Dace upstream of the rail corridor.
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.	Though there are a number of WHPAs present along the rail corridor, there are no proposed activities related to the operation of the rail corridor that would constitute drinking water threats. Thus, no negative effects are anticipated. Construction-related mitigation has been identified.
Areas that may by impacted by a known or suspected on-site or off-site source of contamination such as a spill, a gasoline outlet, an open or closed landfill site etc.	Areas that may by impacted by a known or suspected on-site or off-site source of contamination such as a spill, a gasoline outlet, an open or closed landfill site etc.	A Phase 1 Environmental Site Assessment will be completed to ascertain if there are any known or suspected off-site sources of contamination. There is one former (closed) landfill site located within proximity to the Barrie rail corridor and the new Bradford Layover Facility.
Protected heritage property.	Property designated under Parts IV, V or VI of the *Ontario Heritage Act*; property subject to a heritage conservation easement under Parts II or IV of the *Ontario Heritage Act*; property identified by the Province and prescribed public bodies as provincial heritage property under the Standards and Guidelines for Conservation of Provincial Heritage Properties; property protected under federal legislation, and UNESCO World Heritage Sites.	Six properties protected under Part IV and one Heritage Conservation District protected under Part V of the *Ontario Heritage Act* were identified within the study area. Further study and construction-related mitigation has been identified.
Built heritage resources (BHR).	A building, structure, monument, installation or any manufactured remnant that contributes to a property's cultural heritage value or interest as identified by a community, including an Aboriginal community. Built heritage resources are generally located on property that has been designated under Parts IV or V of the *Ontario Heritage Act*, or included on local, provincial and/or federal registers.	In addition to the properties protected under Parts IV and V of the *Ontario Heritage Act*, there are also several properties designated under the *Heritage Railway Stations Protection Act* (R.S.C., 1985, c.52 (4th Supp.), listed under municipal heritage registries and identified as Protected Heritage Properties. One property is identified as a Protected heritage Property of Provincial Significance.

Matters of Provincial Importance[1]	Definition [2]	Applicability to the BRCE Project
Cultural heritage landscapes (CHL).	A defined geographical area that may have been modified by human activity and is identified as having cultural heritage value or interest 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 *Ontario Heritage Act*; 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 (e.g., 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 *Ontario Heritage Act*. The identification and evaluation of such resources are based upon archaeological fieldwork undertaken in accordance with the *Ontario Heritage Act*. 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 *Ontario Heritage Act* requires archaeological potential to be confirmed through archaeological fieldwork.	There are a number of known archaeological resources and areas with archaeological potential within the BRCE study area. These are being further investigated through Stage 2 Archaeological Assessments.
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 BRCE 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 Oak Ridges Moraine Conservation Act, 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 *Oak Ridges Moraine Conservation Act, 2001* applies.	The BRCE rail corridor traverses the Oak Ridges Moraine and there are portions of land designated as “natural core area” and “natural linkage area” that will be removed as a part of the rail expansion.
Property within an area described as a key natural heritage feature or a key hydrologic feature in the Protected Countryside by the Greenbelt Plan under the *Greenbelt Act, 2005.*	Property within an area described as a key natural heritage feature or a key hydrologic feature in the Protected Countryside by the Greenbelt Plan under the *Greenbelt Act, 2005.*	The BRCE rail corridor traverses the Greenbelt Area and there are portions of land identified as key natural heritage features” that will be removed as a part of the rail expansion. Key hydrologic features will be identified prior to construction.

Note:

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

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

5. Stakeholder Consultation Process

5.1 Overview of the Stakeholder Consultation Process

In accordance with Section 8 of O. Reg.231/08 the BRCE Project included extensive consultation with regulatory agencies (see Section 5.4.1), municipalities, Indigenous communities (see Section 5.4.4), the public, property owners, and other stakeholders to confirm that feedback and comments were considered and addressed. The Project consultation process was based on the following guiding principles:

- That a reasonable effort was made to confirm that potentially affected or interested parties have information available to them and are given the opportunity to make their views known;
- That consultation is open and transparent by documenting the consultation process for the development of the TPAP so that the process can be understood and tracked;
- That the process is responsive by providing opportunities for interested parties to comment on the Project at key stages and by ensuring that such comments are addressed in the EPR;
- That comments and concerns identified throughout the process are considered in a meaningful fashion; and
- That the process will be flexible by allowing response to new issues that emerge as the TPAP proceeds.

Prior to initiation of the TPAP through the issuance of the Notice of Commencement, several activities were conducted in order to confirm the consultation process met all requirements under the TPAP. As such, the BRCE Project was organized into activities carried out prior to TPAP commencement (Pre-TPAP) and those carried out during the formal 120-day TPAP period. These are discussed below.

5.2 Pre-TPAP Consultation Process

The purpose of Pre-TPAP consultation was to identify stakeholders, introduce the BRCE Project and gather preliminary concerns and comments. The Pre-TPAP consultation was initiated in the spring of 2015, continued through the fall of 2016, and included:

- Consultation with the Director, EAB at the MOECC;
- Preparation of a Master Contact List;
- Establishment of a Project specific Website (Project Website);
- Convening Public Meeting #1 (November, 2015) in four communities within the study area and initiating an Online Survey component;
- Convening a Public Meeting regarding the proposed train layover facility (July, 2016), within the Town of Bradford West Gwillimbury;
- Convening Public Meeting #2 (November, 2016) in five communities, held jointly with the GO Rail Network Electrification TPAP Project team and Metrolinx Planning;
- Indigenous engagement through identification of; and correspondence and meetings with, Indigenous communities that may have an interest in the Project;
- Convening EA briefs, preliminary meetings with elected officials, regulatory review agencies; conservation authorities and potentially affected municipalities leading to creation of Technical Advisory Committees (TACs);
- Convening TAC meetings to provide an overview of public consultation efforts, present preliminary drawings and technical work, identify BRCE Project developments and obtain input on the BRCE Project;
- Convening EA and preliminary design meetings with potentially affected developers to identify private development projects and obtain input on the BRCE Project; and
- Circulating draft Technical Reports and draft EPR to regulatory agencies, conservation authorities, Indigenous communities, municipalities and other stakeholders.

5.2.1 *Consultation with the Director*

As required under O. Reg. 231/08 , Metrolinx sent a letter to the Director, EAB at the MOECC, (dated September 10, 2015), requesting a list of bodies that may assist in identifying Indigenous communities which may have an interest in the BRCE Project. The Ministry of Aboriginal Affairs (MAA), now Ministry of Indigenous Relations and Reconciliation (MIRR) was contacted through email correspondence, and the Aboriginal and Treaty Rights Information System (ATRIS) of Aboriginal Affairs and Northern Development Canada (AANDC), now Indigenous and Northern Affairs Canada (INAC), was referenced to further develop the list of Indigenous communities that may have an interest in the BRCE Project. Copies of correspondence are included within the Stakeholder Consultation Report provided in Appendix J of this EPR.

Through consultation with these regulatory agencies, a list of Indigenous communities, and organizations located within 100 kilometers of the study area was compiled. The list of Indigenous communities identified as potentially having constitutionally protected Aboriginal Rights, Treaty Rights or other interests in the BRCE Project are listed in Table 5-3.

Contact information was collected for those Indigenous communities with a potential interest in the BRCE Project and included in the Master Contact List for the Project.

5.2.2 *Master Contact List*

A Master Contact List was compiled consisting of regulatory agencies, conservation authorities, municipalities, Indigenous communities and other stakeholders who may have an interest in the BRCE Project based on the proposed Project works and proximity to the Project. The Master Contact List was developed following initial consultations with the Director, EAB of the MOECC, subsequent regulatory agency consultation and results of the ATRIS search. As well, municipalities located within the rail corridor were contacted to obtain lists of addresses of property owners within 100 metres (measured from the limit of the ROW).

The Master Contact List was continually updated in response to the BRCE Project feedback and stakeholder interest and was used for the distribution of Project related notices throughout the Pre-TPAP and TPAP phases. As correspondence from stakeholders, regulatory agencies, conservation authorities, municipalities and Indigenous communities was received the Master Contact List was used to track correspondence to confirm comments were considered and incorporated into the decision-making process for the BRCE Project. A copy of the Master Contact List (excluding private landowners) is included in the Stakeholder Consultation Report provided in Appendix J of this EPR.

5.2.3 *Project Website*

A Project Website (www.Metrolinx.com/RERBarrie) was developed to provide an overview of the TPAP and BRCE Project information 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 TPAP (including the Pre-TPAP phase).

5.2.4 *Public Meeting #1*

As part of the Pre-TPAP consultation, the first series of Public Meetings (Public Meeting #1) were held on four separate dates in November of 2015 in the City of Toronto, City of Vaughan, Town of Newmarket and City of Barrie as detailed in the Stakeholder Consultation Report provided in Appendix J of this EPR. The purpose of Public Meeting #1 was to present information regarding Metrolinx's transportation goals, and background on the BRCE Project, while providing the public with an opportunity to comment on the Project.

The Notice of Public Meeting #1 included the four dates, locations, time and Project purpose. The Notice was posted in local newspapers including the Newmarket Aurora Era Banner (combined with the East Gwillimbury Express), the Barrie Advance (combined with the Innisfil Journal), the Bradford West Gwillimbury Topic, the Vaughan Citizen, and the York Guardian, on October 22, 2015, and posted on Metrolinx's Website with messaging displayed on Metrolinx's Twitter feed and Facebook page. The Notice of Public Meeting #1 was delivered to all stakeholders on the Master Contact List.

Comments received as a result of Public Meeting #1 noted concerns regarding noise, vibration, property impacts and safety at rail crossings. Details of the public meetings including a summary of issues/concerns and BRCE Project team responses, as of April 4, 2016, are provided in the Public Meeting #1 and Online Consultation Summary Report included in the Stakeholder Consultation Report provided in Appendix J of this EPR. The Public Meeting #1 and Online Consultation Summary Report can be seen in its entirety on the Project Website.

Online Participation Opportunity #1

In coordination with Public Meeting #1, an Online Survey was available from November 6, 2015 through December 8, 2015, which provided an opportunity for the public to participate in the BRCE Project planning. There were 915 online participants who responded to questions in the survey (914 participants completed the survey in English, one in French). Notification of the survey was sent by email to Metrolinx newsletter subscribers.

The most commonly raised issues/concerns by respondents was the need for expanded parking, and a concern that construction of additional stations (stops) would increase the overall commute length. Other issues/concerns raised included integration with local transit services, traffic congestion, service times, the increased cost of fares, safety at crossings/parking facilities, and the potential impacts on the natural environment, damage to property during construction, property value, and the need for property acquisition. A summary of issues/concerns raised and BRCE Project team responses, as of April 4, 2016, are provided in the Public Meeting #1 and Online Consultation Summary Report included in the Stakeholder Consultation Report, provided in Appendix J of this EPR.

5.2.5 *Proposed Train Layover Facility in the Town of Bradford West Gwillimbury – Public Meeting*

As part of the Pre-TPAP consultation, a Public Meeting, including a presentation and Question and Answer period, was held in the Town of Bradford West Gwillimbury on July 13, 2016. The purpose of the Public Meeting was to present information on the proposed train layover facility in the Town of Bradford West Gwillimbury as part of the BRCE Project EA as well as provide an update on plans to electrify the GO service and GO service expansion.

The Notice of Public Meeting regarding the proposed train layover facility was published in the local Bradford West Gwillimbury newspaper (Bradford West Gwillimbury Topic) on June 30 and July 7, 2016 and posted at several locations in the Town of Bradford West Gwillimbury and surrounding area, as well as in four GO Stations within proximity of the proposed train layover facility. In addition, the notice was posted on Metrolinx's Website with messaging displayed on the Metrolinx Twitter feed. Notice to landowners with properties located within 100 metres of the proposed train layover facility was sent as a general ad mail (Canada Post drop), while direct mailing of the Notice was sent to property owners within 30 metres of the proposed train layover facility. Regulatory agencies and potentially affected municipalities were notified of the Public Meeting by email.

Metrolinx also contacted elected officials in the Town of Bradford West Gwillimbury, via email, to advise them of the Project and offer the opportunity to be briefed prior to the public meeting. In this regard, Metrolinx made a presentation to Town of Bradford West Gwillimbury Council members on June 14, 2016, in advance of the Public Meeting (July 13, 2016) which is included in the Stakeholder Consultation Report provided in Appendix J of this EPR.

Common issues/concerns noted in the comment sheets received as a result of the Public Meeting and raised during the Question and Answer Session included train whistling/horns, sufficient parking for expanded service, concerns for pedestrian/cyclist safety at the Bradford GO Station, property requirements, effect on property values and property acquisition/expropriation, and closure of the York University GO Station. A summary of the Public Meeting including issues/concerns raised and Project team responses, as of November 2, 2016, is provided in the Public Meeting Summary Report - Proposed Train Layover in the Town of Bradford West Gwillimbury included in the Stakeholder Consultation Report, provided in Appendix J of this EPR. The proposed train layover Public Meeting Summary Report is available on the Project Website.

5.2.6 *Public Meeting #2*

As part of the Pre-TPAP consultation, the second series of Public Meetings (Public Meeting #2) was held on five separate dates in November, 2016 in five different locations within the BRCE Project study area including the City of Toronto, City of Barrie, Town of Newmarket, Town of Aurora, and City of Vaughan, as detailed in the Stakeholder Consultation Report provided in Appendix J of this EPR. Public Meeting #2 was held jointly with the GO Electrification TPAP Project team and Metrolinx Planning to share information and updates on the BRCE TPAP as well as two other Metrolinx's initiatives involving the construction of new electrification infrastructure (the GO Rail Network Electrification TPAP) and information on the RTP which guides the work being done to transform the transportation network in the GTHA and provided the public with an opportunity to comment on the Project.

The Notice of Public Meeting #2 included the five dates, locations, time and Project purpose. The Notice was posted in local newspapers (see Table 5-1), posted in all GO Stations along the Barrie rail corridor and posted on Metrolinx's Project Website (www.Metrolinx.com/RERBarrie and www.MetrolinxEngage.com) with messaging displayed on the Metrolinx Twitter feed and email messages to subscribers to GO Transit on GO alert service. The Notice of Public Meeting #2 was delivered to all stakeholders on the Master Contact List and property owners in the Project area, up to 100 metres from the rail corridor (measured from the limit of the ROW).

Table 5-1: Local Newspapers for advertising Public Meeting #2 and Dates Notification was Published

Newspapers	Dates of Publication
East York Mirror	October 27, 2016
Etobicoke Guardian	October 27, 2016
Innisfil Journal	October 27, 2016
King Connection	October 27, 2016
King Weekly Sentinel	October 27, 2016
Markham Economist & Sun	October 27, 2016
Mississauga News	October 27, 2016
Newmarket Era Banner	October 27, 2016
North York Mirror	October 27, 2016
Oakville Beaver	October 27, 2016
Innisfil Examiner	October 28, 2016
Toronto L'Express	November 1, 2016
Mississauga, Le Metropolitan	November 2, 2016

Online Participation Opportunity #2

Project information story boards and the materials presented at the Public Meetings were made available on the Metrolinx Project Website (www.Metrolinx.com/RERBarrie) following the meeting for those interested in the BRCE Project but who were unable to attend the Public Meetings. Details were provided as to how those interested could provide their comments.

Input on the Project(s) was received during the comment period following the Public Meeting through the dedicated email address (RERBarrie@metrolinx.com) for the Project and through online comments sheets made available through a dedicated Website Metrolinx Engage (www.MetrolinxEngage.com).

A number of participant comments were received during and following the Public Meeting. Comments received included issues of potential effects on property values and quality of life (e.g., noise, vibration) for residents, in the vicinity of the corridor, the potential need for property acquisition, the lack of available parking at existing GO Stations or loss of parking due to Project, construction, timing for increased level of service, the location of new GO Stations and the possible closure of existing stations, concerns for pedestrian and vehicle safety at crossings along the Barrier rail corridor, and the need to better integrate GO Transit with local public transportation services.

A summary of issues/concerns and Project team responses is included in the Stakeholder Consultation Report provided in Appendix J of this EPR. The Public Meeting #2 Summary Report is available on the Project Website.

5.2.7 *Metrolinx Transit Expansion Meeting in York South-Weston*

On February 6, 2017, the Minister of Citizenship and Immigration Laura Albanese, MPP hosted a public meeting for the local community of the York South-Weston. The meeting was held at Charles E. Webster Public School in the Eglinton West neighbourhood from 6:30 p.m. – 8:30 p.m. Attendees first had a chance to sign-in and review the roll plans that were set up in the back of the room. MPP Laura Albanese chaired the meeting, introduced Metrolinx and staff presented the BRCE and GO Rail Network Electrification TPAP projects, which was followed by a Question/Answered session. Approximately 40 residents attended the public meeting including Councillor Frank Di Giorgio. A good percentage of attendees reside on Treelawn Parkway. The main issues raised by attendees included concerns with receiving Project notifications, future train frequency and schedule, noise impacts, diesel emissions, vegetation removal (trees), impacts to property value, location of future track, grade separation requirements at Castlefield, and Electrification infrastructure impacts. A detailed summary of the meeting and a copy of the presentation is provided in Appendix J of this EPR.

5.2.8 *General Public and Property Owner Correspondence*

Comments were received from the public and local resident stakeholders through the dedicated email address for the Project throughout the Pre-TPAP process, exclusive of public meetings. Correspondence generally included requests to be included on the mailing list and request for Project information following public meetings. Other submissions were of a specific nature, noting questions/concerns with the BRCE Project. Key themes based on review of comments received include:

- Trails and future trail connections and corridor crossings;
- Impacts to future planned developments;
- Safety associated with crossings;
- Flooding;
- Timing of studies;
- Public Meeting format and opportunities for additional events;
- Closure of existing GO Stations and construction of new GO Stations;
- Level of service and timing of additional service;
- Coordination of service with local transit;
- Concern with train whistle blowing; and
- Impacts to property.

Written submissions and Project team responses, are provided in the Stakeholder Consultation Report which is provided in Appendix J of this EPR. A summary of key themes and Project team responses, applicable as of the date of the correspondence, is provided in Appendix J of this EPR.

In addition, correspondence was received from residential developers that have an interest in the Project. Metrolinx discussed elements of potential impacts and integration of proposed and future developments adjacent to the Barrie rail corridor through meetings and an exchange of correspondence with residential developers. Meeting minutes and correspondence with residential developers are provided in Appendix J of this EPR, coupled with a summary of key themes from these discussions and Project team responses.

5.3 Indigenous Community Engagement

Metrolinx engaged Indigenous communities, identified as having a potential interest in the BRCE Project, through written correspondence, including BRCE Project Notices, as well as by phone and in person meetings. Written correspondence to Indigenous communities was delivered by direct mail, courier and email. Indigenous communities contacted throughout the Pre-TPAP and the points of contact are listed in Table 5.-3 as well as the Stakeholder Consultation Report provided in Appendix J of this EPR. Follow-up phone calls were placed to

communities in an effort to confirm receipt of the initial Project Notices, ensure the community was aware of the opportunity to comment, assess the level and type of interest in the BRCE Project and inquire if they have any comments/questions, as well as establish how they wished to be engaged in the future. Follow up emails were sent to the communities following issue of draft Technical Reports for review (Stage 1 Archaeological Assessment and the EPR) to inquire if they had any comment or questions and ensure they were aware of the opportunity to provide comment in the later stages of the Project. Correspondence is included in the Stakeholder Consultation Report provided in Appendix J of this EPR.

As a result of expressed interest from the Indigenous communities on all Metrolinx initiatives, Metrolinx arranged a meeting on May 26, 2016 with consultation liaisons from four of the Williams Treaties First Nations[35] (Mississaugas of Alderville First Nation, Curve Lake First Nation, Hiawatha First Nation and Scugog Island First Nation)) to discuss the BRCE Project as well as other Metrolinx initiatives outside the scope of this EA. Meetings with all seven Williams Treaties First Nation communities were held on July 18, 2016 and September 9, 2016 to discuss a number of Metrolinx projects, including the BRCE Project. An overview of comments from Indigenous communities, including meetings with the Williams Treaties First Nations communities, and Project team responses at the time of correspondence is provided in the Stakeholder Consultation Report provided in Appendix J of this EPR. Full comments received through correspondence and minutes of meetings are also provided in Appendix J of this EPR. A summary of comments provided by Indigenous communities under key themes is as follows:

- Acknowledgement of receipt of Notice(s);
- Standards and methods for engagement;
- Contact for correspondence;
- Significant archaeological interests and requirements to be involved in archaeological investigations;
- Requests for further Project information to determine the level of interest;
- Request to include opportunities to raise awareness and general knowledge of First Nation communities in Metrolinx projects and transit opportunities;
- Consideration of opportunities for the employment and training of community members; and
- Consideration of a GO Transit fare discount.

[35] *The Williams Treaties First Nations are comprised of the Mississaugas of Alderville First Nation, Curve Lake First Nation, Hiawatha First Nation, Scugog Island First Nation, Chippewas of Beausoleil First Nation, Georgina Island First Nation and the Rama First Nation. The traditional territories of the Williams Treaties First Nations are located primarily in the Georgian Bay and Lake Ontario watersheds and includes certain principal tributaries and streams.*

Table 5-3: List of Indigenous Communities Contacted During the Pre-TPAP for the Barrie Rail Corridor Expansion Project

Indigenous Communities	Notice of Public Meeting #1	Public Meeting #1 Summary Report	Notice of Bradford Layover Facility Public Meeting	Williams Treaties First Nations Meeting	Williams Treaties First Nations Meeting	Notice of Public Meeting #2	Review of Stage 1 Archaeological Assessment[1]	Opportunity to Review Environmental Project Report
Mississaugas of Alderville First Nation	October 22, 2015	May 20, 2016	June 23, 2016	May 26, 2016	July 18, 2016	October 27, 2016	-	March 6, 2017
Beausoleil First Nation (Christian Island)	October 22, 2015	May 20, 2016	June 23, 2016	-	July 18, 2016	October 27, 2016	-	March 3, 2017
Chippewas of Georgina Island First Nation	October 22, 2015	May 20, 2016	June 23 2016	-	July 18, 2016	October 27, 2016	-	March 3, 2017
Chippewas of Mnjikaning First Nation (Rama)	October 22, 2015	May 20, 2016	June 23, 2016	-	-	October 27, 2016	-	March 3, 2017
Curve Lake First Nation	October 22, 2015	May 20, 2016	June 23, 2016	May 26, 2016	July 18, 2016	October 27, 2016	-	March 3, 2017
Hiawatha First Nation	October 22, 2015	May 20, 2016	June23, 2016	May 26, 2016	July 18, 2016	October 27, 2016	-	March 3, 2017
Huron-Wendat Nation	October 22, 2015	May 20, 2016	June 23, 2016	-	-	October 27, 2016	November 17, 2016	March 3, 2017
Kawartha Nishnawbe First Nation	October 22, 2015	May 20, 2016	June 23, 2016	-	-	October 27, 2016	-	March 3, 2017
Mississaugas of the New Credit First Nation	October 22, 2015	May 20, 2016	June 23, 2016	-	-	October 27, 2016	November 17, 2016	March 3, 2017
Mississaugas of Scugog Island First Nation	October 22, 2015	May 20, 2016	June 23, 2016	May 26, 2016	July 18, 2016	October 27, 2016	-	March 3, 2017
Mohawks of the Bay of Quinte	October 22, 2015	May 20, 2016	June 23, 2016	-	-	October 27, 2016	November 17, 2016	March 3, 2017
Moose Deer Point First Nation	October 22, 2015	May 20, 2016	June 23, 2016	-	-	October 27, 2016	-	March 3, 2017
Wahta Mohawks (Mohawks of Gibson)	October 22, 2015	May 20, 2016	June 23, 2016	-	-	October 27, 2016	-	March 3, 2017
Karry Sandy-McKenzie, Coordinator Williams Treaties communities	-	May 20, 2016	June 23, 2016	May 26, 2016	July 18, 2016	October 27, 2016	November 17, 2016[36]	March 3, 2017
Métis Nation of Ontario (MNO)	October 22, 2015	May 20, 2016	June 23, 2016	-	-	October 27, 2016	-	March 3, 2017

[1]Review of the Stage 1 Archaeological Assessment was offered to al Indigenous Communities. Only those which accepted the offer are noted.

[36] *For distribution of the reports and Review Comment Spreadsheet to the William Treaties First Nations*

5.4 Regulatory Agency and Municipal Consultation

As part of the Pre-TPAP consultation phase Metrolinx met with regulatory agencies, conservation authorities and municipalities with jurisdiction within the Barrie rail corridor in the summer of 2015 and continued to meet throughout the Pre-TPAP phase. Details regarding these consultation activities are provided below.

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

Metrolinx initially met with municipally elected officials, regulatory agencies and municipalities on an individual basis to present an overview of the BRCE Project. Following these preliminary meetings, TACs were established by municipality and grouped by Region, and a series of TAC meetings were held as the Project progressed through the Pre-TPAP consultation phase. Additionally, municipally elected officials, regulatory agencies and municipalities provided input to the BRCE Project outside of scheduled meetings through written correspondence regarding Project specific questions.

At each meeting, Metrolinx presented an overview of the BRCE Project status, reviewed preliminary plans and drawings and discussed issues of importance or concern with participants. Meeting dates and participating regulatory agencies and elected officials are listed in the Stakeholder Consultation Report provided in Appendix J this EPR. 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 District);
- Lake Simcoe Region Conservation Authority (LSRCA);
- Toronto and Region Conservation Authority (TRCA);
- City of Toronto;
- York Region;
- City of Vaughan;
- Town of Aurora;
- Township of King;
- Town of Newmarket;
- Town of East Gwillimbury;
- County of Simcoe;
- City of Barrie;
- Town of Innisfil;
- Town of Bradford West Gwillimbury;
- Toronto Transit Commission (TTC);
- Canadian National Railway (CNR); and
- Barrie Collingwood Railway.

Minutes were taken at each meeting and are provided in Appendix J of this EPR. Key themes of discussion included:

- Grade separation and pedestrian crossings;
- Property acquisition;
- Track alignment;
- Impacts to adjacent planned developments;
- New GO Station locations;
- Station access and upgrades;
- Service levels;
- Noise and vibration considerations;
- Physical impact of electrification;
- Proposed train layover facility;
- Impact to natural and cultural heritage features; and
- Consultation and engagement.

5.4.2 Meetings with Elected Officials

Metrolinx met with Members of Provincial Parliament (MPPs) during a Barrie RER Committee meeting held on November 13, 2015, to present an overview of the BRCE 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 provided input to the BRCE Project. MPs and MPPs provided notification during the course of the BRCE Project are listed in Table 5-2. Correspondence with elected officials is provided in the Stakeholder Consultation Report, provided in Appendix J. Key themes of discussion and comment included the need for a GO Station in the Yorkdale/Orfus area and a request for meeting materials.

Table 5-2: Elected Officials and MPPs Contacted During the Pre-TPAP for the Barrie Rail Corridor Expansion Project

Members of Provincial Parliament within the Legislative Assembly of Ontario	Members of Parliament
Honourable Laura Albanese, MPP Honourable Chris Ballard, MPP Mike Colle, MPP Honourable Steven Del Duca, MPP Ann Hoggarth, MPP Honourable Helena Jaczek, MPP Monte Kwinter, MPP Cristina Martins, MPP Gila Martow, MPP Julia Munro, MPP	Leona Alleslev, MP John Brassard, MP Julie Dzerowicz, MP Honourable Ahmed Hussen, MP Honourable Peter Kent, MP Michael Levitt, MP Marco Mendicino, MP Kyle Peterson, MP Deborah Schulte, MP Honourable Peter Van Loan, MP
City of Toronto	**City of Vaughan**
John Tory, Mayor Gord Perks, Councillor Ana Bailao, Councillor Cesar Palacio, Councillor Josh Colle, Councillor Frank Di Giorgio, Councillor Maria Augimeri, Councillor Anthony Perruzza, Councillor Sarah Doucette, Councillor	Maurizio Bevilacqua, Mayor Sandra Racco, Councillor Marilyn Iafrate, Councillor Alan Shefman, Councillor Rosanna DeFrancesca, Councillor Tony Carella, Councillor Michael Di Biase, Councillor Mario Ferri, Councillor Gino Rosati, Councillor
Township of King	**Town of Aurora**
Steve Pellegrini, Mayor Cleve Mortelliti, Councillor Avia Eek, Councillor Debbie Schaefer, Councillor	Geoffrey Dawe, Mayor John Abel, Councillor Sandra Humfryes, Councillor Michael Thompson, Councillor Jeff Thom, Councillor Wendy Gaertner, Councillor Harold Kim, Councillor Tom Mrakas, Councillor Paul Pirri, Councillor
Town of Newmarket	**Town of East Gwillimbury**
Tony Van Bynen, Mayor Dave Kerwin, Councillor Thom Vegh, Councillor Jane Twinney, Councillor Tom Hempen, Councillor Joe Sponga, Councillor Kelly Broome-Plumley, Councillor	Virginia Hackson, Mayor James R. Young, Councillor Tara Roy-DiClemente, Councillor Marlene Johnston, Councillor Joe Persechini, Councillor
Town of Bradford West Gwillimbury	**Town of Innisfil**
Rob Keffer, Mayor Gary Baynes, Councillor Peter Ferragine, Councillor	Gord Wauchope, Mayor Doug Lougheed, Councillor Richard Simpson, Councillor Donna Orsatti, Councillor Stan Daurio, Councillor Bill Loughead, Councillor Carolyn Payne, Councillor Rob Nichol, Councillor
City of Barrie	
Jeff Lehman, Mayor Arif Khan, Councillor Sergio Morales, Councillor Mike McCann, Councillor	

5.4.3 *Regulatory Agency and Municipal Correspondence*

In addition to meetings as described above, written correspondence was also received from elected officials, regulatory agencies and municipalities during the Pre-TPAP process. Correspondence was received from the MNRF, TRCA, MOECC and Transport Canada, Ontario Heritage Trust (OHT), Ministry of Transportation, as well as provincial, federal and municipally elected officials. Municipal correspondence was received from staff of the City of Toronto, York Region, City of Vaughan, Towns of Aurora and Newmarket, the County of Simcoe, and the Towns of Innisfil and Bradford West Gwillimbury and the City of Barrie. Copies of correspondence is provided in the Stakeholder Consultation Report in Appendix J of this EPR, and generally included acknowledgement of receipt of Notice(s) as well as contacts for correspondence and TAC meeting participation. Comments of a specific nature, noted questions/concerns, are summarized by key theme, along with Project team responses (provided at the time of the correspondence, where applicable), provided in Appendix J of this EPR.

Key themes based on review of the questions/concerns received included:

- Impacts to future planned developments or infrastructure improvements in the vicinity of the Barrie rail corridor, and property requirements;
- Inquiries about whistling cessation process;
- Recommendations for new GO Station locations;
- Recommendations for grade separations;
- Impact of electrification on existing and planned structures;
- Improved integration with local transportation networks, including trail crossings; and
- Consideration of Secondary Plans and other information.

5.4.4 *Regulatory Agency, Indigenous Communities and Municipal Review of Draft Technical Reports and Draft Environmental Project Report*

Regulatory agencies, conservation authorities, Indigenous communities and municipalities were provided with an opportunity to review draft Technical Reports prior to commencement of the TPAP. Select individual draft Technical Reports were forwarded to those agencies anticipated to have a specific interest in the subject matter in advance of the EPR. The comprehensive draft EPR was also provided to those agencies considered to have an interest in the project. All draft Technical Reports were appended to the comprehensive draft EPR. Table 5-3 lists the regulatory agencies, conservation authorities, Indigenous communities and municipalities which received draft Technical Reports and the comprehensive draft EPR. Table 5-3 also indicates which reports were commented on by reviewers. Comments resulting from the review of draft Technical Reports and the EPR are provided in Appendix J of this EPR.

Table 5-3: Draft Technical Reports and Draft Environmental Project Report Reviewed by Agencies

Agency	Stakeholder Consultation Report (SCR)	Natural Environment Report (NER)	Tree Inventory Plan and Arborist Report (TIPAR)	Socio-Economic and Land Use Characteristics Report (SELUC)	Stage 1 Archaeological Assessment (Stage 1 Arch)	Cultural Heritage Screening Report (CHSR)	Air Quality Study (AQS)	Noise and Vibration (NVIA)	Traffic Analysis (TIA)	Environmental Project Report (EPR) with Appendices	Report Comments Received
MOECC										X	EPR, SCR, Stage 1 Arch, TIA, NVIA, AQS
MTCS										X	EPR, Stage 1 Arch, CHSR
MNRF										X	NER, TIPAR, EPR
Indigenous communities[1]					X					X	Stage 1 Arch (Huron-Wendat Nation)
TRCA		X	X	X	X					X	SELUC, TIPAR, NER
LSRCA		X	X	X	X					X	SELUC, TIPAR, NER, EPR,
Infrastructure Ontario										X	
MTO										X	TIA, EPR
Ontario Heritage Trust										X	TIPAR, NER
TTC										X	EPR, TIA
City of Toronto		X	X	X	X	X	X		X	X	NVIA, TIPAR, SELUC, NER, AQS, CHSR, EPR
York Region[2]		X	X	X	X	X	X		X	X	TIA, NER, TIPAR, SELUC, NVIA, EPR
Township of King		X	X	X	X	X	X		X	X	-
City of Vaughan		X	X	X	X	X	X		X	X	Stage 1 Arch, SELUC, NVIA, EPR
Town of Aurora		X	X	X	X	X	X		X	X	Stage 1 Arch, CHSR, SELUC, TIPAR
Town of Newmarket		X	X	X	X	X	X		X	X	TIA, NVIA, EPR
Town of East Gwillimbury		X	X	X	X	X	X		X	X	EPR
Town of Bradford West Gwillimbury		X	X	X	X	X	X		X	X	EPR
Town of Innisfil		X	X	X	X	X	X		X	X	TIPAR, TIA, SELUC,
City of Barrie		X	X	X	X	X	X		X	X	TIA, CHSR
County of Simcoe		X	X	X	X	X	X		X	X	TIA, EPR

[1] *Huron-Wendat Nation, Mississaugas of New Credit First Nation, Mohawks of Bay of Quinte, Ms. Karry Sandy-McKenzie representing Williams Treaties communities.*

[2] *York Region (to distribute to its lower tier municipalities).*

5.5 TPAP Consultation Process

During the TPAP phase, consultation focused on follow up with stakeholders, confirmation that concerns had been adequately addressed and identification of any additional concerns. Consultation during the TPAP phase was initiated May 11, 2017 in accordance with O. Reg. 231/08, Transit Projects Regulation. It is the proponent's duty to determine the best means of consultation throughout the assessment. The following section summarizes consultation activities conducted by Metrolinx during the TPAP phase.

5.5.1 Master Contact List

The initial Master Contact List used for distribution of the Notice of Public Meeting #1 was updated to include contacts for any correspondence received throughout the Pre-TPAP phase. This list was used for distribution of notices during the TPAP phase and to track correspondence throughout the Project. A copy of this Master Contact List is provided in Appendix J of this EPR.

5.5.2 Notice of Commencement

In order to inform the public and regulatory agencies conservation authorities, Indigenous communities, municipalities of the initiation of the TPAP, a Notice of Commencement and Public Engagement was posted in local Newspapers on May 11 (or May 12, July 26 or July 27 in some newspapers) and July 27 (or August 2 or August 3 in some newspapers) 2017, (see Table 5-4); placed in all GO Stations along the Barrie rail corridor, emailed to subscribers of GO Transit On the GO alert service, posted on Metrolinx's Project Website (www.metrolinx.com/RERBarrie), Twitter feed and Facebook page, delivered to all stakeholders identified in the Master Contact list and property owners within the Project area up to 200 metres from the rail corridor (measured from the limit of the ROW).

Table 5-4: Local Newspapers used to Advertise the Notice of Commencement and Engagement #3

Newspaper	Dates of Publication of the Notice of Commencement	
	1st Publication	2nd Publication
Barrie Advance	May 11, 2017	July 27, 2017
Barrie Examiner	May 11, 2017	July 27, 2017
Bradford Topic	May 11, 2017	July 27, 2017
Innisfil Journal	May 11, 2017	July 27, 2017
Innisfil Examiner	May 12, 2017	July 28, 2017
King Connection	May 11, 2017	July 27, 2017
King Weekly Sentinel	May 11, 2017	July 27, 2017
Newmarket Aurora Era Banner	May 11, 2017	July 27, 2017
Richmond Hill Liberal	May 11, 2017	July 27, 2017
East Gwillimbury Express	May 11, 2017	July 27, 2017
Thornhill Liberal	May 11, 2017	July 27, 2017
Vaughan Citizen	May 11, 2017	July 27, 2017
York Guardian	May 11, 2017	July 27, 2017
Mississauga Le Metropolitain (French)	July 26, 2017	August 2, 2017
Bloor West Villager	July 27, 2017	August 3, 2017
North York Mirror	July 27, 2017	August 3, 2017

The Notice of Commencement included information about the BRCE Project and TPAP as well as how to provide comment. A copy of the Notice of Commencement is provided in Appendix J of this EPR for reference.

5.5.3 Public Engagement #3

Initiated with the Notice of Commencement, an Online Survey was available from May 11, 2017 through June 1, 2017, which provided an opportunity for the public to participate in the BRCE Project planning. There were 170 online participants who responded to questions in the survey.

The survey included two types of question formats: yes/no responses and open ended responses (see Appendix K of this Report for details). The survey included questions associated with four general themes: demographics of participants, participation at Public Meetings during the Pre-TPAP engagement activities, concerns with the BRCE Project; and, impacts to heritage properties.

Copies of the draft Technical Reports and preferred design drawings were made available on the Project Website (http://www.metrolinx.com/RERBarrie) for review prior to completing the survey.

The most commonly raised issues/concerns by survey respondents was a need for express service and greater frequency of service, concern about the impact of train noise (including horn/whistle noise) as a result of increased service. Other issues/concerns raised included potential effects on property and quality of life (e.g., noise, vibration, air quality) for residents in the vicinity of the corridor, a lack of available parking at existing GO Stations, a need to retain existing GO Stations or add additional stations, the timeline for construction and implementation of the BRCE Project, congestion and pedestrian /cyclist access at stations and connectivity with other local modes of transportation, a need to consider grade separations at crossings along the Barrie rail corridor, a need to address potential heritage impacts and impacts to the natural environment, and a need for timely notification with broad distribution, and frequent updates to engage communities. A summary of issues/concerns raised and Project team responses, as of June 1, 2017, are provided in Appendix K of the Stakeholder Consultation Report.

5.5.4 Written Submissions from the General Public and Property Owners

Comments were received from the public and local resident stakeholders through the dedicated email address for the Project during the TPAP comment period from May 11 to June 1, 2017, exclusive of the online survey. Correspondence generally included requests to be included on the mailing list and request for Project information. Other submissions were of a specific nature, noting questions/concerns with the BRCE Project. Key themes of the comments included:

- Level of service and construction of new stations;
- Whistle blowing and noise due to increased service; and
- Pedestrian/cyclist connections and corridor crossings.

Written submissions and Project team responses, are provided within the Public Engagement #3 and Online Summary Report in Appendix K of the Stakeholder Consultation Report, provided in appendix J of this EPR.

5.6 Indigenous Community Engagement

The Indigenous communities identified as having a potential interest in the BRCE Project were sent letters including the TPAP Notice of Commencement and Public Engagement #3 on May 12, 2017 by direct mail, courier and email. Follow up calls were made to all communities to confirm receipt of Notice. Follow up emails were sent to the communities providing a summary of the TPAP process, consultation efforts completed during the Pre-

TPAP period, a schedule of TPAP dates, including the anticipated date of the Notice of Completion, and the opportunity to comment on the Project. Indigenous communities contacted during the TPAP are listed in correspondence is provided in Appendix J of this Report.

Comments were received during the TPAP comment period from two communities:

- Chippewas of Mnjikaning First Nation (Rama), which provided an email acknowledgement of the receipt of the Notice of Commencement, noting the Notice was shared with Council and forwarded to the Williams Treaties First Nation Process Co-ordinator/Negotiator, Karry Sandy-McKenzie, for action, if required.
- Huron-Wendat Nation, which provided comments on the Stage 1 Archaeological Assessment.

5.7 Incorporation of Stakeholder Comments

Metrolinx will take into consideration the comments and input received from stakeholders through detailed design phases of the Project. Upon completion of the TPAP, consultation with members of the public and interested stakeholders will continue with a round of community meetings being planned to support the design and construction of the Barrie rail corridor expansion to ensure continued communication on the BRCE Project.

5.8 Notice of Completion and Environmental Project Report Review

Within 90 days after the Notice of Commencement has been issued, a Notice of Completion of the EPR will be published. The dates of publication of the BRCE Notice of Completion is anticipated for August 10, 2017 (August 9 in some newspapers) and August 17, 2017 (August 16 and August 18 in some newspapers). The local Newspapers to advertise the Notice of Completion are found in Table 5-5.

The Notice will also be posted on Metrolinx's Website and messaging will be displayed on the Metrolinx Twitter feed and Facebook page. The Notice will also be mailed to all stakeholders on the Master Contact List which includes potentially interested and affected residents, anyone who has expressed an interest in the BRCE Project, regulatory agencies, conservation authorities, municipalities and Indigenous communities. A draft Notice of Completion is provided in Appendix J of this EPR.

Table 5-5: Local Newspapers used to Advertise the Notice of Completion

Newspaper	Notice of Completion	
	1st Publication (planned)	2nd Publication (planned)
Barrie Advance	August 10, 2017	August 17, 2017
Barrie Examiner	August 10, 2017	August 17, 2017
Bradford Topic	August 10, 2017	August 17, 2017
Innisfil Journal	August 10, 2017	August 17, 2017
Innisfil Examiner	August 11, 2017	August 18, 2017
King Connection	August 10, 2017	August 17, 2017
King Weekly Sentinel	August 10, 2017	August 17, 2017
Newmarket Aurora Era Banner	August 10, 2017	August 17, 2017
Richmond Hill Liberal	August 10, 2017	August 17, 2017
East Gwillimbury Express	August 10, 2017	August 17, 2017
Thornhill Liberal	August 10, 2017	August 17, 2017
Vaughan Citizen	August 10, 2017	August 17, 2017
York Guardian	August 10, 2017	August 17, 2017
Mississauga Le Metropolitain (French)	August 9, 2017	August 16, 2017
Bloor West Villager	August 10, 2017	August 17, 2017

If a stakeholder (member of the public, regulatory agencies, conservation authorities, Indigenous community, or municipality etc.) has concerns about the BRCE Project, they are welcome to submit objections to the MOECC Environmental Approvals Access and Service Integration Branch for the Minister to consider. Objections must be provided in writing and can only be submitted during the 30-day review period for the EPR, commencing at the issuance of the Notice of Completion. A copy should also be provided to the Director, EAB of the MOECC and Metrolinx as the proponent. Information required for the objection must include:

- Contact information (including name, mailing address, organization or affiliation, phone number and email address (where possible);
- Proponent (Metrolinx) contact information (including name, address, phone number and representative/agency phone number);
- Brief description of the proponent's (Metrolinx) proposed undertaking, including location;
- Basis for why further study is required, including relevance to Aboriginal or treaty rights and matters of provincial importance that were not considered in the EPR; and
- Summary of how the objector has been involved in the consultation process (e.g., meetings, phone calls, emails etc.).

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 the appropriate information can be found, or provide the missing information.

Following the 30-day review period, the Minister has 35 days to provide comment and decide whether the BRCE Project has a negative impact on matters of provincial importance or Aboriginal or Treaty Rights. At this point the Minister can approve the BRCE Project as planned, allow it to proceed subject to conditions; require the proponent to take further steps including further study or consultation; or choose to terminate the TPAP if they feel the EPR does not address these impacts.

5.9 Commitments to Future Work and Consultation

Metrolinx has committed to ensuring that consultation with regulatory agencies, the public and Indigenous communities will continue through the detailed design, construction and operational phases of the BRCE Project. A Consultation Plan will be prepared at the commencement of each of these phases 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.

5.10 Statement of Completion

A Statement of Completion will be issued no earlier than 65 days after the Notice of Completion was published. The Statement of Completion will indicate Metrolinx's intention to proceed with the BRCE Project in accordance with the EPR and any revisions which may have been made during the review period. The Statement of Completion will be sent to the MOECC Director (EAB) and Regional Director (Central Region Office) and will be posted on Metrolinx's Project Website (http://www.metrolinx.com/RERBarrie).

6. Permit and Approval Requirements

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 Transit Projects Regulation (e.g., 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).

In keeping with recognized best practices in the field of EA, proponents are encouraged to undertake introductory activities and consultation through Pre-Planning Activities prior to the commencement of the TPAP. Following completion of the Pre-Planning Activities, the proponent initiates the TPAP by issuing the Notice of Commencement. It is at this point that the regulated 120-day timeframe commences.

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 for the BRCE Project 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 BRCE 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 preferred 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. A

6.1 Federal

There are a number of permit, approval and agreement requirements by federal agencies which apply to one or more phases of the BRCE Project including detailed design, construction and post-construction. The following section identifies the federal requirements that are anticipated to be required for the work activities associated with the BRCE Project. A summary is provided in Table 6-1.

Table 6-1: Summary of Federal Permits or Approvals

Permit, Approval or Agreement Required	Federal Agency
Federal land acquisition consultation with responsible authorities	CLCL/PDP
Temporary Land Use Approval (during construction)	CLCL/PDP
Request for Review of Endangered Species – Consultation (*Fisheries Act*)	DFO
Navigation Protection Act Approval for Holland River bridge work at Mile 41.00	Transport Canada
Migratory Birds Convention Act Consultation	ECCC
Risk assessment to be completed in accordance with the Railway Safety Management System Regulations for all BRCE Project components.	Transport Canada

6.1.1 Canadian Environmental Assessment Agency

The *Canadian Environmental Assessment Act, 2012* (CEAA, 2012) protects the environment from significant adverse environmental effects caused by a project that is considered to be a "designated project". A "designated project" includes any physical activity that is prescribed in the Regulations Designating Physical Activities under the Act.

CEAA, 2012 may apply if the project is on federal lands and requires a federal authority to exercise any power or perform any duty or function that could permit a project to be carried out. In these cases, the federal authority would need to determine that carrying out such a project is not likely to cause significant adverse environmental effects. In accordance with CEAA, 2012, projects that are referred to the Canadian Environmental Assessment Agency as a "designated project" may require a federal EA.

A detailed review of the CEAA, 2012 and the Regulations Designating Physical Activities was completed with respect to the proposed work activities associated with the BRCE Project. It was confirmed that the proposed BRCE Project is not listed under the Regulations Designating Physical Activities. However, a small portion of land

is to be acquired for grading to facilitate the expansion to the existing Barrie rail corridor in the vicinity of the Downsview Park/Airport, which is federally owned. In keeping with Section 67 of CEAA, 2012 (federal lands provision), an Authority (in this instance, CLCL) must not make a decision about a project on federal lands unless the project is determined to be unlikely to cause significant adverse environmental effects or the Governor in Council decides that those effects are justified under subsection 69(3) of CEAA, 2012. Accordingly, Authorities are required to consider the likelihood of significant adverse environmental effects before a project can proceed.

At this time, the lands to be affected during construction (predicted footprint area) including lands required for grading activities has not been confirmed at the preliminary design level. As such, Metrolinx cannot confirm if CEAA, 2012 applies pursuant to Section 67 of the Act (federal lands provision). The lands to be affected during construction will be confirmed prior to completion of the detailed design when predicted footprint impacts will be determined, including lands to be acquired to carry out the Project. Accordingly, Metrolinx will continue to consult with CLCL and PDP regarding land acquisition to determine if CLCL, as a responsible authority, has to exercise a power, duty or function in relation to the land acquisition or works on Federal Land including potential permitting for temporary use of these lands during construction, as determined throughout detailed design and prior to construction.

6.1.2 *Environment and Climate Change Canada - Species at Risk*

In accordance with the *Species at Risk Act* (SARA, 2002), permits may be issued or agreements may be entered into to authorize certain activities that would otherwise contravene the general or critical habitat prohibitions, if certain conditions are met for species that are listed as extirpated, Endangered, or Threatened under Schedule 1[37]. Prohibitions under SARA, 2002 are typically based on impacts to federal lands. On private lands, the general prohibitions typically only apply to aquatic species listed as Endangered, Threatened or Extirpated in Schedule 1 of SARA, 2002; and migratory birds listed in the MBCA, 1994 (MBCA, 1994) that are also listed as Endangered, Threatened or Extirpated in Schedule 1 of SARA, 2002. The general prohibitions listed under SARA, 2002, and potential permits that may be required, do not apply to species listed as Special Concern.

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, 2002 permit requests are administered by ECCC.

As part of the BRCE TPAP, a review of potential Schedule 1 SARA habitat located in and within proximity to the study area was completed and documented within the NER prepared in support of the BRCE EPR provided in Appendix A. As documented therein, a number of species listed on Schedule 1 of SARA, 2002, have the potential to be affected by the BRCE Project. Thus, further 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 study area in accordance with SARA, 2002. If one or more listed species are confirmed present, a SARA, 2002 permit application will be submitted to ECCC.

6.1.3 *Fisheries and Oceans Canada*

In accordance with the *Fisheries Act*, R.S.C., 1985 approval from Fisheries and Oceans Canada (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, or Aboriginal Fishery, as defined in the Act. In keeping with DFO requirements under the *Fisheries Act*, R.S.C, 1985, Self-Assessments will be undertaken where Project work is proposed in, or near-water. Where potential effects to fish or fish habitat cannot be avoided and the Project activities could result in serious harm to fish, DFO will be consulted through the Request for Project Review process and based on their review, Metrolinx may require an Authorization prior to conducting the work.

6.1.4 *Environment and Climate Change Canada - Migratory Bird Regulations*

In accordance with the MBCA, 1994, compliance under the Act is required for projects where activities may affect migratory birds and their active nesting areas particularly during identified breeding periods. The Act stipulates that any removal of vegetation should be carried out at the appropriate time of year to protect migratory birds and their nests.

Currently, the *Migratory Birds Regulations* (MBR) do not provide for authorizations or permits for the incidental take of migratory birds or their nests or eggs in the course of industrial or other activities. As such, to minimize the possibility of contravening the law, taking reasonable care, and avoidance are the best approaches to take when contemplating any activity that has the potential to impact migratory birds, nests or eggs. The works associated with the BRCE Project are expected to be carried out in compliance with the appropriate breeding bird timing windows, and nesting periods will be respected. However, as the detailed design progresses, if it is determined that the proposed works will require contravention of the timing windows, Metrolinx will engage with ECCC (likely though the Canadian Wildlife Service (CWS) to confirm the applicability of MBCA, 1994 throughout detailed design and prior to construction.

There is a responsibility to adhere to these regulations and ensure compliance particularly during tree and vegetation removal associated with site clearance. No permit can be issued for the incidental take of migratory birds or their nest or eggs as a result of economic activities.

6.1.5 *Transport Canada - Navigation Protection Program*

In accordance with the *Navigation Protection Act,* R.S.C. 1985 (NPA, 1985) construction of works is prohibited in, on, over, under, through or across any navigable water that is provided on the List of Scheduled Waters unless approval has been provided by Transport Canada. The Holland River, from the bridge on Bridge Street to Lake Simcoe, is listed in Part 2 of the NPA, 1985 Schedule of Navigable Waters (Rivers and Riverine) as a "*navigable*" watercourse. This section of the Holland River is crossed by the Barrie rail corridor (at Mile 41.00), just north of Bridge Street. Therefore, the proposed works for bridge widening or reconstruction in the area of this crossing are subject to approval by Transport Canada under the NPA, 1985.

It is noted that no other navigable waters were identified on the List of Scheduled Waters in relation to the BRCE Project. As such, no additional navigable waters are subject to the NPA, 1985.

6.1.6 *Transport Canada – 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 on mainline track. The BRCE Project will

[37] *The Act establishes Schedule 1, as the official list of wildlife SAR. It classifies those species as being either Extirpated, Endangered, Threatened, or a special concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.*

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 BRCE Project.

6.2 Provincial

There are a number of provincial permit, approval and agreement requirements for all phases of the BRCE Project including detailed design, construction and post-construction periods. The following section identifies the provincial requirements that are anticipated to be required for the work activities associated with the BRCE Project. A summary is provided in Table 6-2.

Table 6-2: Summary of Provincial Permit or Approval Requirements

Permit or Approval Required	Provincial Agency
Environmental Compliance Approval – Air & Noise	MOECC
Environmental Compliance Approval – Stormwater	MOECC
Environmental Compliance Approval – Groundwater & Surface Water	MOECC
Environmental Compliance Approval – Sewage Works	MOECC
Permit to Take Water (PTTW)/Environmental Activity Sector Registry (O. Reg. 387/04).	MOECC
Hazardous Waste Information Network Registry (O. Reg. 347)	MOECC
Endangered Species Act – Regulatory Exemption Permit	MNRF
Licence to Collect Fish for Scientific Purposes	MNRF
Public Lands Act Work Permit	MNRF
Cultural Heritage Evaluation Report	MTCS
Stage 1 Archaeological Assessment	MTCS
Heritage Impact Assessment	MTCS
Strategic Conservation Plans	MTCS
Encroachment Permits	MTO
Occupation Permits	MTO
Designated Substance Surveys, Abatement/Management Plans	Ministry of Labour (MOL)

6.2.1 *Ministry of the Environment and Climate Change*

6.2.1.1 *Environmental Compliance Approval - Air and Noise*

In accordance with the *Environmental Protection Act,* 1990, (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, 1990, an Environmental Compliance Approval (ECA) will be required from the MOECC for the BRCE Project in relation to the additional (second) track and any upgrades to GO Station maintenance room (generator) and snowmelt boiler room emissions associated with air and noise, prior to its commissioning. Metrolinx will obtain an ECA 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 is to demonstrate that the BRCE Project complies with the MOECC sound level limits outlined in the ECA.

6.2.1.2 *Environmental Compliance Approval - Stormwater Works*

For compliance with the EPA, 1990, 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, 1990, an ECA will be required from the MOECC for the BRCE Project in relation to approval of the additional (second) track within the corridor and any upgrades to GO Stations that result in discharges and SWM Plans. 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 BRCE 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.

6.2.1.3 *Temporary Environmental Compliance Approval - Groundwater and Surface Water*

As part of the Geotechnical Investigation to be carried out prior to the construction phase, soil and groundwater samples will be analyzed for potential contamination. If the Geotechnical Investigations 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, in accordance with the MOECC ECA requirements and conditions, a groundwater monitoring and treatment plan/program for pre-construction and construction periods may be required. It is noted that this temporary ECA is a separate application from the ECA for the permanent SWM System.

6.2.1.4 *Environmental Compliance Approval – Sewage Works*

For compliance with the EPA, 1990 and Section 53 of the *OWRA, 1990* (OWRA, 1990), 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. Under Section 20.2 of the EPA, 1990, an ECA will be required from the MOECC for the BRCE Project in relation to approval of the layover facility sewage works. It is not expected that the rail infrastructure or station improvement works will alter any existing sewage works. As such, Metrolinx will apply for an ECA for the layover facility prior to the construction phase.

6.2.1.5 *Well Abandonment and Source Protection*

The MOECC regulates well abandonment under O. Reg. 903 of the OWRA, 1990 and is responsible for approving Source Protection Plans from local source protection committees. Source Water Protection Plans and Assessment were reviewed to characterize the groundwater regime across the study area and are documented within the NER prepared in support of the BRCE Project, provide in Appendix A of this EPR. The Approved Source Water Protection Plan for the Credit Valley, Toronto and Region and Central Lake Ontario (CTC) Source Water Protection Area (CTC Source Water Protection Plan, 2015) provided relevant information for the study area within the TRCA's jurisdiction, while Part 1 (Lake Simcoe Watershed) of the January, 2015 Approved Assessment: Lake Simcoe and Couchiching – Black River Source Protection Area (South Georgian Bay Lake Simcoe Source Protection Region, 2015), provided relevant information for the study area within the LSRCA's jurisdiction.

Though there are a number of WHPAs identified as present along the Barrie rail corridor, transportation infrastructure is not subject to Source Water Protection regulations as it is unlikely to cause negative effects. Based on review of the list of activities and the circumstances required for a Threat occurrence, there are no activities related to the operation of a rail corridor that are anticipated to meet the criteria to be considered a source protection threat. Given that there are no proposed activities related to the rail corridor that would constitute drinking water threats, no source water protection regulations will apply to this corridor. Prior to Project 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.

It is not expected that any of the municipal wells documented within the NER in proximity to the study area will require abandonment to facilitate implementation of the BRCE Project. There may however be additional wells present on properties within the study area that will be acquired to facilitate the BRCE Project (e.g., obtained through property acquisition). 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.

6.2.1.6 *Permit to Take Water*

Dewatering activities were previously governed by the PTTW process in compliance with O. Reg. 387/04, issued under Section 34 of the OWRA, 1990, for temporary water takings from the environment that exceed 50,000 litres/day. This includes water drawn from groundwater and surface water. However, in March 2016, the MOECC introduced new water taking regulations that allow for construction related dewatering to proceed under the Environmental Activity Sector Registry (EASR) requirements if dewatering volumes are above the O. Reg. 387/04 threshold (e.g., 50,000 litres/day) but below 400,000 litres/day.

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. The following construction activities are examples of where a PTTW or EASR may be required for this Project:

- Dewatering of groundwater may be required during construction activities as part of the installation of any grade separation or structural foundation work at existing bridges that require widened spans; and
- Dewatering of groundwater may be required during construction activities as part of the tunnel works for the GO Station improvements.

In the March 2016 update, the MOECC clarified that surface water diversion to allow in-water construction works does not require a PTTW. Therefore, surface water pumped to enable in-water works to occur in the dry during construction at culverts and bridges for the BRCE Project does not currently require a PTTW.

As part of the detailed design phase, a Geotechnical Investigation and Hydrogeological Study will be completed 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, Metrolinx will need to register for the EASR, 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, 1990. In addition, the permit application must be accompanied by a groundwater study completed by a qualified person (e.g., 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, 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 Investigation and Hydrogeological Studies.

6.2.1.7 *Waste Transportation and Processing*

In accordance with *Ontario Regulation 347 - "General - Waste Management"* (O. Reg. 347), under the EPA, 1990, subject waste activities must be registered with the MOECC. The Hazardous Waste Information Network (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, 1990.

All waste materials will be manifested with records maintained by Metrolinx during Construction of the BRCE Project and any subject waste identified during construction of the BRCE 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, 2007. The MNRF maintains an Ontario list of SAR for which it guides 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, 2007. 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, 2007, may be protected under other various existing laws (e.g., *Fish and Wildlife Conservation Act*, MBCA, *Fisheries Act*). Areas of significant habitat for species of special concern are protected under the PPS (2014) and OPs as significant wildlife habitat.

As part of the BRCE TPAP, a review of potential SAR habitat located in and within proximity to the study area was completed and documented within the NER prepared in support of the BRCE EPR, provided in Appendix A of this EPR. As documented therein, a number of SAR have the potential to be affected by the BRCE Project. Thus, further surveys will be carried out prior to the construction phase to confirm the presence/absence of SAR within the study area in accordance with the MNRF species specific survey windows and protocols. If SAR are confirmed present, 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.

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 many of the watercourse crossings where bridge/culvert works, and potential watercourse realignments are proposed. The MNRF issues these licenses to qualified professionals (e.g., Aquatic Ecologist/Biologist) for the purposes of collecting, documenting, and salvaging fish. For the purposes of the BRCE Project, fish salvages (and a Licence to Collect Fish) will be required to prevent "serious harm to fish that are part of a commercial, recreational or Aboriginal 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 (e.g., 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 (e.g., Terrestrial Ecologist/Biologist) for the purposes of collecting, documenting, and salvaging wildlife. For the purposes of the BRCE 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.

6.2.2.2 *Public Lands Act Work Permit*

In accordance with O. Reg. 239/13, a work permit is required from the MNRF for construction activities on provincial (Crown) lands. A work permit may be required for the BRCE Project should the work required to widen the existing water crossings involve construction activities on public land, including Crown-owned shore lands. The lands to be affected during construction will be confirmed during completion of the detailed design when predicted footprint impacts will be determined.

6.2.3 *Ministry of Tourism, Culture and Sport*

As part of the BRCE TPAP, a Stage 1 Archaeological Assessment, CHSR, various CHERs and an HIA were prepared and submitted under separate cover as part of the BRCE EPR. These are provided in Appendices C, D and E of this EPR, respectively.

Based on the Stage 1 Archaeological Assessment property inspection, it was determined that the majority of the study area has been previously disturbed by construction of the existing rail ROW and adjacent development. However, notwithstanding this disturbance, significant sections of the study area were found to retain archaeological potential and will require further archaeological assessment should the detailed design confirm that these areas will be affected by the Project. All required Archaeological Assessments must be completed prior to commencement of any project-related activities. Metrolinx shall only proceed with project-related activities when all Archaeological Assessments 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 Transportation*

It is recognized that construction within or adjacent to a provincial highway ROW will require a permit from the MTO. The Ministry issues permits under the *Public Transportation and Highway Improvement Act* and administration of the permits is the responsibility of the MTO Corridor Management Office.

Encroachment and Occupation Permits will be required for any works within the ROW limits of the Highway 401 (Mile 8.80), Highway 407 (Mile 13.81), and Highway 7 (Mile 14.23). Encroachments include works or structures that may during the construction, installation, or maintenance thereof, obstruct, cause material to be deposited upon, enter upon, take up, bridge over, tunnel under or in any way interfere with the land within the limits of a provincial highway or the roadway or any structure forming a part of the provincial highway. In addition, an Encroachment Permit will also be required for any investigation or survey work within a provincial highway ROW prior to construction.

The preferred design identifies that the proposed BRCE track alignment can be accommodated within the existing Highway 401 underpass bridge span and that no widening work is required for the Highway 407 and Highway 7 overpass bridges. The construction of the BRCE Project will require an Encroachment Permit from the MTO and for the construction work to be undertaken by a RAQS approved Contractor. In addition, the track design should be further considered prior to construction to confirm that there is acceptable crash protection for the MTO structure to the acceptance of MTO. An agreement for MTO access for future inspection and maintenance of the MTO structure will also be required between Metrolinx and the MTO.

The MTO has designated the lands for the potential Highway 400/404 Link (Bradford Bypass) to protect from development pressure and ensure the corridor is available for future transportation needs. The designation gives MTO permit control. As such, any works within the Bradford Bypass limits or within permit control area, as per sec. 38(2) of *Public Transportation and Highway Improvement Act*, requires MTO review and approvals. MTO will need to review and issue permit approvals for rail expansion across the Bradford Bypass. The proposed Bradford Layover Facility is also within MTO permit control area and will require MTO approval.

6.2.5 *Ministry of Labour*

6.2.5.1 *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 Ministry of Labour (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 *Occupational Health and Safety Act* (OHSA), R.S.O. 1990 (MOL) and regulations.

6.3 Conservation Authorities

There are a number of conservation authority permit, approval and agreement requirements for all phases of the BRCE Project. As an agency of the Province of Ontario, Metrolinx is exempt from the *Conservation Authorities Act*, R.S.O. 1990 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 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 BRCE Project. A summary is provided in Table 6-3.

Table 6-3: Summary of Conservation Authority Permits or Approvals

Permit or Approval Required	Conservation Authority
Permit to Work in Regulated Areas (O. Reg. 166/06) Permit to Work in Regulated Areas (O. Reg. 179/06)	TRCA/LSRCA
SWM Plan	TRCA/LSRCA
Erosion & 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 Minister of Natural Resources and Forestry 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 (e.g., *Ontario Regulation 166/06 - Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* (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 BRCE Project through a Voluntary Project Review 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 Project will require working in TRCA regulated areas in a number of locations throughout the study 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", August, 2012 and the MOECC Storm Water Management guidelines, March, 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", December, 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;
- A watercourse crossing design submission will be provided for any new or replacement structures within TRCA regulated areas in accordance with the TRCA document "Crossings Guideline for Valley and Stream Corridors" September, 2015;
- Estimated tree removals are included in the NER and the Tree Inventory Plan and Arborist Report, provided in Appendix A and B of this EPR, respectively for TRCA review and comment. The NER and Tree Inventory Plan and Arborist Report were both completed in support of the BRCE EPR to detail how potential effects to terrestrial natural heritage features (including individual trees) within the study area will be avoided and/or mitigated during development of the BRCE Project; and
- As an ongoing measure, Metrolinx is also currently consulting with conservation authorities and municipalities to establish a Vegetation Compensation Protocol for Metrolinx RER Projects. 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 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. The goal is to reduce administrative permitting burden for trees affected within long stretches of the rail corridor.

For Trees within Metrolinx Property: Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property. This will involve categorizing trees by community type/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with applicable conservation authorities and affected municipalities to develop the final compensation plan.

Conservation Authorities: For vegetation removals within conservation authority lands where required, applicable removal and restoration requirements will be followed.

Federal lands: For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements will be followed.

Tree End Use: Metrolinx develop options for the end use of trees removed from Metrolinx property e.g. reuse/recycling options.

6.3.2 *Lake Simcoe Region Conservation Authority*

As noted above, Metrolinx is exempt from the LSRCA Regulations (e.g., *Ontario Regulation 179/06 - Lake Simcoe Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* (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, the LSRCA will be engaged on the BRCE Project through a Voluntary Project Review 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 in a number of locations throughout the study area. 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;

- 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, March, 2012, and Lake Simcoe Protection Plan (July, 2009). This SWM design will be submitted in accordance with the LSRCA Technical Guidelines for Stormwater Management Submissions (April, 2013) and the MOECC SWM Guidelines, (March, 2003). 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 (2013), ESC measures must be in accordance with ESC Guidelines for Urban Construction (2006). See Section 6.3.1 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 NER and the Tree Inventory Plan and Arborist Report provided in Appendices A and B, of this EPR respectively, for LSRCA review and comment. These two reports were completed in support of the BRCE EPR to detail how potential effects to the terrestrial natural heritage features (including individual trees) within the study area will be avoided and/or mitigated during development of the BRCE Project; and
- As an ongoing measure, Metrolinx is also currently consulting with conservation authorities and municipalities to establish a Vegetation Compensation Protocol for Metrolinx RER Projects. 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 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. The goal is to reduce administrative permitting burden for trees affected within long stretches of the rail corridor.

For Trees within Metrolinx Property: Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property. This will involve categorizing trees by community type/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with applicable conservation authorities and affected municipalities to develop the final compensation plan.

Conservation Authorities: For vegetation removals within conservation authority lands where required, applicable removal and restoration requirements will be followed.

Federal lands: For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements will be followed.

Tree End Use: Metrolinx will develop options for the end use of trees removed from Metrolinx property e.g. reuse/recycling options.

6.4 Municipal

There are a number of municipal permit, approval and agreement requirements to be considered for all phases of the BRCE Project. Metrolinx is exempt from municipal regulations and policies and is not subject to municipal permit and approval requirements. 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.

The study area for the Barrie rail corridor crosses 11 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;
- 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.

Metrolinx will continue to communicate and engage with the above-noted municipalities throughout detailed design and prior to construction of the BRCE 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 BRCE Project. A summary is provided in Table 6-4.

Table 6-4: Summary of Municipal Permits 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
Bridge Widening/Replacement	Applicable Municipalities
Culvert Widening	Applicable Municipalities
Grade Crossing	Applicable Municipalities
Zoning Approval	Applicable Municipalities
Municipal Water & Sewer Connections Applications	Applicable Municipalities

Metrolinx will adhere to the intent of the relevant permits/approvals requirements to the greatest extent possible and will make submissions 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;
- SWM Plans for discharging water and wastewater including ESC and Dewatering Plans. Specifically, in Simcoe County, 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; and
- 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.

In addition, Metrolinx will consult with each respective municipality as it relates to other ancillary infrastructure. This includes:

- Proposed bridge widening or replacement requirements. Metrolinx will continue to engage and convene discussions with affected municipalities throughout detailed design and prior to construction for bridge crossing, widening or reconstruction requirements;
- Proposed culvert widening requirements. Metrolinx will continue to engage and convene discussions with affected municipalities throughout detailed design and prior to construction for culvert widening or reconstruction requirements; and
- Proposed or expanded at grade crossing requirements including safety assessments. Metrolinx will continue to engage and convene discussions with affected municipalities throughout detailed design and prior to construction for at-grade crossing widening requirements.

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 *Planning Act*, 1990. 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*

Metrolinx will prepare and submit a Municipal Service Application to the relevant municipality for any water and sewer connections required for the BRCE Project (including the proposed Bradford Layover Facility). 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.

6.5 Utilities

The following section identifies other permits, approvals and/or agreements that are anticipated to carry out the work activities associated with the BRCE Project. A summary is provided in Table 6-4.

Table 6-5: Summary of Utility Permits or Approvals

Permit, Approval or Agreement Required	Utility Agency or Authority
Utility Crossing Agreement	Various existing Utility Owners
Hydro Connection Application and Service Agreements	Various Local Distribution Companies (Hydro One, Alectra Utilities, etc.)
Gas Connection Application and Service Agreements	Various Local Distribution Companies (Enbridge, Union etc.)
Utility Cut Permit	Applicable Municipality or Authority.

6.5.1 *Existing Utilities*

Metrolinx contacted existing utility owners during the Pre-TPAP phase to discuss potential effects of the BRCE Project on existing utilities. Based on these discussions, potential effects were investigated, and mitigation measures identified as appropriate to avoid or minimize the anticipated effects (see Section 2.1.8 of this EPR). As noted therein, in excess of 1,500 utility crossings have been identified based on the preferred design, and there are a number of utilities and utility owners within the Barrie rail corridor and adjacent lands who will be affected by the Project.

All potentially affected utility owners, including those contacted during the Pre-TPAP phase will be consulted throughout detailed design and prior to construction. At this time, Metrolinx will work collaboratively with potentially affected utility owners to identify conflicts and develop applicable protection and/or relocation strategies in advance of application submission and receiving clearance. For any Project construction activities required within

an existing utility ROW, or required utility clearance zone, an Agreement will be obtained from the appropriate utility owner, prior to the commencement of construction.

Metrolinx will continue to work with the existing utility providers within the Barrie rail corridor to address all implementation issues in accordance with existing crossing agreements. These utility owners will be included in TPAP consultation. Implementation and construction obligations will be undertaken pursuant to the crossing agreements with each of the affected utility companies, as required.

6.5.1.1 *Existing Hydro One Networks Inc. Infrastructure*

Metrolinx will work with Hydro One Networks Inc. (Hydro One) to ensure all implementation issues are addressed in accordance with the Hydro One crossing agreement relating to the relocation and/or burial of the existing Hydro One overhead line in the Barrie rail corridor. In addition, the following potential requirements related to Hydro One's infrastructure will be discussed with Hydro One:

- The need to avoid obstruction to Hydro One facilities as a result of the BRCE Project; and,
- Compliance with transmission line clearance requirements.

6.5.2 *New Service and Utility Connections*

Metrolinx will submit Connection Applications, as required, to the applicable utility companies for the purposes of any new services required along the Barrie rail corridor, including those required for the GO Station improvements and the proposed Bradford Layover Facility. 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.

6.5.2.1 *Hydro Connection Agreements*

Metrolinx will prepare and submit Connection Applications to the relevant hydro provider (e.g., Toronto Hydro, Alectra Utilities, Newmarket Hydro, InnPower and Hydro One) for any new hydro connections required for the BRCE Project including the proposed layover facility. The hydro provider will complete a Customer Impact Assessment and conduct a Cost Estimate Study. 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.

6.5.2.2 *Gas Connection Agreements*

Metrolinx will prepare and submit a Connection Application to the relevant gas provider (e.g., Enbridge Gas and/or Union Gas) for any new gas connections required for the BRCE Project including the proposed layover facility. The gas provider will complete a Customer Impact Assessment and conduct a Cost Estimate Study. 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.

6.6 Transit Corporations

Various safety and training protocols will be established as required, with respect to the planned integration and connection of existing bus and rail services that will continue to operate and are planned to interchange along the Barrie rail corridor. In this regard, Metrolinx will consult with the applicable transit corporations (e.g., TTC, YRT/VIVA, VIA Rail Canada, etc.) as required to submit the detailed design where it interfaces with the infrastructure, utilities and operations of any applicable transit corporations. The intent of this dialogue is to minimize any potential effects to current transit operations due to construction and/or operations/maintenance of the BRCE Project and allow transit operators to review and accept the detailed design prior to the commencement of construction.

6.7 Rail Authorities

Various safety and training protocols will be established, as required, in compliance with the rail authorities, with the intent being to minimize any potential effects to current freight operations along the Barrie rail corridor. In this regard, Metrolinx will consult with the following rail authorities, as required:

- CNR;
- CPR; and
- Barrie-Collingwood Railway (BCRY).

6.7.1 *Canadian National Railway*

The overpass of the CNR York Subdivision line at Mile 13.25 is not expected to be affected by the BRCE Project however work may be required within the CN ROW. Metrolinx recognizes that an Agreement (or amendment to an existing Agreement) will be obtained from CNR to carry out any work within CN's existing ROW. As such, Metrolinx included CNR in the BRCE TPAP consultation and will begin discussions with CNR throughout detailed design and prior to construction to inform and discuss the Project, including the identification of potential effects to ongoing CNR operations. As part of these discussions, every effort will be made to avoid effects to CNR services, and operations.

6.7.2 *Canadian Pacific Railway*

The Barrie rail corridor currently intersects the CPR North Toronto Subdivision at-grade at Mile 4.60. The trains travelling on either track are currently required to wait until the other track is clear before progressing. A grade separation is planned to elevate the Barrie rail corridor over the Davenport Diamond and alleviate this conflict and delay. Metrolinx recently submitted the TPAP EPR for the Davenport Diamond Grade Separation in May 2016, which is being implemented as a separate project from the BRCE Project. Metrolinx made a commitment within the 2016 EPR to review potential effects prior to the construction phase to confirm that there will be no effects to the existing CPR rail lines, services, and operations.

As the detailed design for both the Davenport Diamond and the BRCE Projects progress, if any modifications are identified for this grade separation, consultation with CPR will be requested and an amendment to the existing Agreement obtained from CPR, as necessary, to carry out any construction works within CPR's existing ROW. In the event that a railway crossing Agreement (or amendment) cannot be reached with CPR, this crossing would require the intervention of the Canadian Transportation Agency (CTA) for a federal order. As noted above, the CTA may authorize the construction of the railway line or any related work, and may rule on the disputed issues.

6.7.3 *Barrie-Collingwood Railway*

Consultation with the BCRY will be required for the Future Phase(s) of the BRCE Project, as the section of the Project between Mile 62.17 and Mile 63.00 is in proximity to the BCRY Beeton Spur track. Metrolinx will include BCRY in the BRCE TPAP consultation and will begin discussions with BCRY throughout detailed design and prior

to construction to inform and discuss the Project. It is not anticipated that any formal approval will be required from BCRY.

7. Future Commitments

The future EPR 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, mitigation measures, and the associated net effects with the BRCE Project have been identified, evaluated and assessed in the earlier sections of this EPR. As part of the normal evolution of a project, the detailed design phase may lead to refinement or modification of the proposed preferred design as described in this EPR. 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 Project construction to confirm completeness. The following commitments are discussed by affected environment: Natural Environment, Cultural Environment and Social and Built Environment.

Metrolinx will develop an EMMP which will summarize potential environmental impacts or approval requirements that arise during completion of the detailed design and the additional environmental studies, as required. Metrolinx will obtain all the required permits and approvals for the BRCE Project as contained with the EMMP, and the detailed design Consultant will be responsible for updating the EMMP once the permits and approvals are received, and/or findings from the additional environmental studies are available. The Consultant shall also include any additional mitigation measures or requirements, and any new monitoring or reporting requirements.

The Contractor will implement the requirements of the EMMP prior to/during construction. The Consultant shall provide environmental monitoring services and adhere to the reporting requirements detailed in the EMMP, providing instruction to the design team and Contractor as required, and issuing preventive and/or corrective action requests, as required.

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

- Prepare and implement an EMMP (including reporting requirements) throughout detailed design and prior to construction, to ensure Metrolinx is compliant with the commitments listed in this EPR, 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 by the Contractor;
- Undertake all additional studies/work as outlined in Sections 4 and 7 of this EPR prior to Project implementation;
- Review and confirm all permits and approvals prior to the construction phase as described in Section 6 of this EPR. Secure all required permits/approvals prior to Project implementation;
- Implement all mitigation measures as documented in this EPR throughout the detailed design, construction and operations/maintenance phases of the Project, as appropriate;
- All construction activities will be monitored by a qualified Environmental Inspector who will review the effectiveness of the mitigation measures and construction 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 construction process.

7.1 Detailed Design Commitments

Future commitments to be completed throughout detailed design and prior to construction of the BRCE Project are identified in Table 7-1 below as it relates to the natural, cultural, social and built environments.

7.2 Construction Commitments

Future commitments to be completed during the construction phases of the BRCE Project are identified in Table 7-2 below as it relates to the natural, cultural, social and built environments.

Table 7-1: Summary of Future Detailed Design Commitments

Feature	Future Commitment
Natural Environment	
Significant Wildlife and Terrestrial Environment	Metrolinx will coordinate compensation with public agencies through implementation of the Vegetation Compensation Protocol for Metrolinx RER Projects for any removals of portions of PSW, Non-Significant and unevaluated wetlands, Significant Woodlands, ANSIs and Significant Valleylands, Significant and Candidate SWH, and Habitat for SCC.
	Detailed clearing and ESC Plans will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects for areas subject to conservation authority regulations and for any removals of portions of PSW, Non-Significant and unevaluated wetlands, Significant Woodlands, ANSIs and Significant Valleylands, Significant and Candidate SWH, and Habitat for SCC. During the detailed design phase, the rail infrastructure will be designed to avoid the loss of any Confirmed Habitat of Endangered or Threatened species to the extent possible.
	Construction laydown areas will be located to avoid natural features (Candidate and Confirmed) to the extent possible. Any construction laydown areas or easements located within Candidate or Confirmed Habitat of Endangered or Threatened species will be subject to applicable requirements under the ESA, 2007.
	If Osprey nests cannot be accommodated in their current position, the MNRF will be contacted to develop a relocation plan. In this instance a plan would be developed in consultation with the MNRF and may include installation of a nesting platform in an alternative location and removal of the existing nest outside of the breeding season.
	Culvert design, land clearing, ESC Plans and restoration plans will be submitted to the TRCA and LSRCA for voluntary review.
	Detailed site surveys will be undertaken prior to construction to confirm the presence of the following species and the survey findings reported to the MNRF: • King Rail; • Least Bittern; • Eastern Whip-poor-will; • Blanding's Turtle; and • Little Brown Myotis, Northern Myotis, and Tri-colored Bat.
	Timing windows for any necessary removal of any Confirmed Endangered or Threatened Species habitat will be developed in consultation with the MNRF.
	Field surveys will be undertaken to confirm the number of Barn Swallow nests present at the known locations and whether the nests remain active. The design will avoid the loss of Barn Swallow nesting sites to the extent possible. Where loss or disturbance (e.g., due to any work on the bridges) cannot be avoided, the MNRF will be contacted and all requirements under the ESA, 2007, will be met, including any registration, compensation, replacement structures and/or permitting requirements.
	Wildlife exclusion fencing and escape features will be developed and designed in consultation with the TRCA/LSRCA and MNRF. Passage structures that accommodate movement of wildlife will be incorporated into the design of associated culverts or bridges where passage is currently limited. TRCA, LSRCA and MNRF will be consulted on the location and design of ecopassages.
	The frequency and timing of Environmental Inspections will be confirmed in consultation with municipalities, conservation authorities and the MNRF as required.
	A SMP will be developed. The plan will include a strategy to prevent Bank Swallow from nesting in stockpiled or exposed soils.
	Metrolinx will work with municipalities, TRCA, LSRCA and other landowners to create visual breaks using compensation plantings where feasible.
Drainage and Aquatic Environment	A detailed SWM plan will be prepared in accordance with the MOECC, conservation authority and municipality requirements.
	An ESC and Dewatering Plan will be developed in consultation with the TRCA and LSRCA and will conform to industry BMPs and recognized standard specifications. The ESC and Dewatering Plan will also take into account the GGHACA ESC Guidelines for Urban Construction (2006).

Feature	Future Commitment
	A SMP shall be prepared by a Qualified Professional prior to the construction phase to form part of the Construction Contract for managing soil materials on-site (including excavation, location of stockpiles, reuse, and off-site disposal).
	Conservation authorities will be engaged through the Voluntary Project Review process prior to construction regarding SWM plans for the BRCE Project and to coordinate any planned stormwater works for other projects being completed within proximity to the Barrie rail corridor.
	Further Geotechnical Investigations will be undertaken including soil and groundwater sampling prior to the construction phase of the BRCE Project to determine the extent of any contaminants and for consideration of a waste management strategy for any contaminated waste material identified on the site.
	A groundwater and soil management strategy including emergency response and communication plans will be developed to confirm proper mitigation and notification procedures are in place regarding groundwater quality during the BRCE Project construction and operations/maintenance.
	A survey of the study area will be completed to confirm the presence of domestic water wells. If domestic wells are discovered within the study area, provisions will be added to the Construction Contract Documents to ensure that the Contractor provides adequate quality and quantity of water to affected well owners during the construction phase of the BRCE Project.
	Metrolinx will investigate potential for localized groundwater impacts and retain the services for a detailed Hydrogeological Study if recommended following completion of the Geotechnical Investigations. Metrolinx will consult with the applicable conservation authorities if Hydrogeological Studies are undertaken.
	Metrolinx will determine dewatering requirements as applicable for the construction works to determine if a PTTW or EASR is required and consult with the applicable conservation authority through the Voluntary Project Review process regarding construction dewatering.
	Metrolinx will coordinate any dewatering requirements with the other Project works that may be ongoing in the study area.
	An Aquatic Habitat Assessment will be prepared to identify specific effects and mitigation associated with detailed culvert and bridge design plans and fish habitat loss and/or disturbance.
	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.
Trees	An update of the tree removal count of the rail infrastructure, GO Stations improvements and the Bradford Layover Facility will occur prior to construction.
	A tree inventory which accounts for the detailed grading, contractor work zones and proposed clearing will be completed to illustrate TPZ and their protection measures (types and locations), and tree removal zones.
	Design will avoid the loss of Butternut trees to the extent possible and detailed site investigations will be undertaken to confirm whether any additional Butternut trees are present within areas to be cleared.
	A BHA must be completed by a Certified Butternut Health Assessor for all Butternut trees that must be removed to accommodate the BRCE Project. The approach for the BHA will be conducted in consultation with the MNRF, and all findings will be reported to the MNRF. All requirements under the ESA, 2007 will be met, including any registration, Butternut Compensation Planting Plans and/or permitting requirements. If more than 10 retainable trees must be removed, it is recognized that the exemption regulation does not apply and a permit and/or ministerial approval may be required.
	The BMP for tree management and acceptable arboricultural standards will be identified prior to construction. Recommendations will include: Ash woody debris management to prevent spread of Emerald Ash Borer, pruning of limbs to be carried out by or under the direction of a Certified Arborist, felled woody debris to be scattered to prevent creation of unsightly piles.
	Detailed tree removal, restoration, and compensation plans will be prepared prior to Project construction in coordination with a Certified Arborist and/or Landscape Architect to assist with species selection, planting locations and measures to confirm establishment success.
	A Landscape Plan will be developed to stabilize and revegetate any disturbed areas surrounding buildings and facilities. The Landscape Plan shall include provisions for replacement plantings comprised of high quality non-invasive species.

Feature	Future Commitment
	Metrolinx is currently consulting with conservation authorities and municipalities to establish a Vegetation Compensation Protocol for Metrolinx RER Projects. 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.
	Metrolinx will continue to adhere to municipal By-laws and policies for tree removals on municipal land and private properties adjacent to the rail ROW. The opportunity to salvage existing vegetation, particularly sensitive species, for transplanting from within the project boundaries will also be explored.
	Vegetation removal will be kept to a minimum and limited to within the construction footprint, where feasible.
	Trees adjacent to work zones in jurisdictions outside of the City of Toronto may experience impacts to critical rooting areas as a result of grading impacts, contractor work zones including laydown areas, construction easements, and accesses. Trees within or adjacent to the work zones, as defined by the detailed design, will be assessed to determine if trees will be impacted and require compensation.
	Metrolinx will continue to communicate and engage with the municipalities throughout detailed design and prior to construction of the BRCE Project to confirm that any municipal concerns are addressed to the greatest extent possible.
Cultural Environment	
Archaeological Resources	All required AA (Stage 2 and Stage 3 if recommended by the Stage 2 AA) will be completed in advance of any ground disturbance/construction activities. All work will be completed by a licenced consultant archaeologist. This will apply to the following sites: • Various zones of archaeological potential located on both sides of the rail corridor and in the vicinity of GO Stations as shown on Figures 32 to 53 in the Stage 1 Archaeological Assessment in Appendix C; • Heritage Glen site (Borden #BcGv-20); and • Allandale site (Borden #BcGw-69).
	Cemetery Investigations and a Stage 2 Archaeological Assessment that also includes archival research on properties with known or potentially containing cemeteries will be completed. This applies to the following sites: • St. Helen's Historic Church (Mile 3.35); • Mt. Sinai Memorial Park (Mile 9.30); • Maple United Church Cemetery (Mile 18.18); • St. Paul's Cemetery (59.18); and • LeFroy United Church (Mile 51.92).
	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, and include provisions in the construction contract(s) as recommended by archaeological assessment(s). Should the proposed BRCE Project ROW extend beyond the land previously reviewed for archaeological potential, additional archaeological work will be completed as required. If human remains are confirmed to be present, then local law enforcement and the Office of the Chief Coroner for Ontario will be immediately notified to review the discoveries and confirm that the site is not of forensic interest. Non-forensic findings will be subsequently communicated to the Cemeteries Registrar. Any documented human remains will be subjected to protection and avoidance by effects proposed by the BRCE Project.

Cultural Heritage Resources	Metrolinx will complete HIAs for directly affected CHRs in accordance with the applicable Standards and Guidelines during detailed design or prior to construction. An HIA will be completed for the following properties: PHPs: • St. Clair Avenue West Bridge (Mile 5.24); • Stone Box Culvert – 1 (Mile 20.86); and • Bradford GO Station (Mile 41.60). Conditional PHPs: • Newmarket GO Station/Tannery Mall (Mile 34.35); and • 91 Franklin Street (Mile 34.44). For properties that may be indirectly affected, consultation with heritage staff at the respective municipality should be undertaken to review the detailed design for BRCE works, to determine if any heritage attributes have been identified and whether they may be indirectly impacted. If attributes are not identified, a CHER will be required during detailed design or prior to Project construction to determine if the property may be indirectly impacted. If required, an HIA will be completed during detailed design or prior to Project construction to confirm that impacts of heritage resources are appropriately mitigated. Potentially indirectly affected properties include: PHPPS: • Aurora GO Station (Mile 29.90). PHPs: • Maple GO Station (Mile 18.28); CHPs: • Former St. Clair Avenue Train Station, Listed, City of Toronto (Mile 5.31); • Farmscape-1, Listed, City of Vaughan (Mile 20.32); • Golf Range, Listed, City of Vaughan (Mile 20.76); • Farmscape-2, Property of interest by municipality, City of Vaughan (Mile 20.84); • Farmscape-5, Listed, City of Vaughan (Mile 21.63); • Sawyer/Cortelucci House, Designated Part IV OHA (Mile 53.90); and • Former Allandale Train Station (Mile 63.00). Adjacent Properties: • National Cash Register Company Factory, Designated, Part IV OHA (Mile 3.20); • Downsview Park and Airport, Listed, City of Toronto and the Federal Heritage Buildings Review Office (FHBRO) (Mile 10.00); and • Maple Village Heritage Conservation District (HCD), Designated Part V OHA (Mile 18.10-18.30); • Crawford and Maud Wells House, Designated Part IV OHA (Mile 23.20);

Feature	Future Commitment
	• Thomas Jaffrey Robertson House, Designated, Part IV OHA (Mile 33.90); and • Former Newmarket Train Station, Designated, Part IV OHA (Mile 34.35).
	Potential effects on adjacent CHRs listed in Table 4-5 and Table 4-11 due to increased vibration will be assessed during detailed design in accordance with *Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects* (Wilson, Ihrig & Associates Inc., et. al., 2012).
	In any area where a heritage resource will be directly affected a qualified Heritage Consultant should be retained to be on-site during construction, as required.
	Metrolinx will consult with the Town of Aurora on the design of the proposed bumping post at Aurora GO Station to ensure that they are complimentary to the heritage character of the Historic Railway Station.
Social and Built Environment	
Socio-Economic and Land Use Characteristics	Metrolinx will consult/engage and negotiate with affected businesses to determine appropriate mitigation to minimize effects.
	Metrolinx will undertake a review prior to the construction phase of the BRCE Project to identify temporary easements for construction or other purposes, temporary leased land for construction access/laydown and permanent property acquisition requirements to accommodate the BRCE Project work.
	A legal survey will be completed prior to construction to confirm property impacts.
	Metrolinx will consult/engage and negotiate with affected owners regarding land acquisition and easements required for the proposed works.
	Metrolinx will acquire the necessary property prior to the construction stage of the BRCE Project and provide fair market value compensation to affected property owners in accordance with applicable laws.
	Metrolinx will complete site assessments for any land being acquired, leased or requiring a construction easement and determine what properties require further site assessment work.
	Metrolinx will notify all landowners with a structure (e.g., building, fence, garden, parking area etc.) encroaching onto the existing ROW by mail that structures will need to be removed by the property owner.
	Metrolinx will continue to consult with the Town of Innisfil on the acquisition of aggregate resource lands in the Lefroy-Belle Ewart area.
	Metrolinx will seek to develop an aesthetically pleasing design for public-facing retaining walls or other appropriate project infrastructure in consultation with municipalities/adjacent landowners. Metrolinx will confirm final type, location and height of retaining walls and noise walls.
	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.
	Metrolinx will work with the City of Vaughan to identify potential effects and develop mitigation in relation to the proposed community garden at the Vaughan City Hall and the future Block 18 District Park at Mile 17.06.
Air Quality, Noise, and Vibration	Mitigation measures such as the noise barriers will be investigated to reduce the noise effects at identified sensitive areas.
	Mitigation measures such as the installation of ballast mats and/or trenches will be investigated to reduce the vibration effects at identified sensitive areas.
	Wherever feasible, foundations for infrastructure will be designed to minimize the need or extent of pile driving.
Traffic and Transportation Infrastructure	New ridership forecasts were made available in February 2017 that will be reviewed and inform the detailed design phase of the BRCE Project.
	The updated GO Transit Rail and Station Access Plan (Metrolinx, 2016) will be reviewed to inform the detailed design phase of the BRCE Project.
	Metrolinx will carry out further review of traffic operations to contribute to recommended intersection treatments for site access.
	Metrolinx will coordinate work with municipalities carrying out other planned road projects within proximity to the Barrie rail corridor.

Feature	Future Commitment
	Metrolinx will consult/engage and coordinate with municipalities with existing and proposed trails within the Barrie rail corridor and work with municipalities to create trail access to stations, where feasible, prior to construction of each station.
	The Construction Contract Documents will include provisions for traffic, transit, cyclist and pedestrian management strategies to address potential traffic infiltration, operations and safety concerns.
	Metrolinx will prepare site-specific Traffic Control and Management Plans to maintain reasonable access through the work zone (e.g., maintain one lane in each direction, where possible) for the affected municipality to review.
	Metrolinx will review road works and improvements proposed for the site access. Where it is not possible to maintain access, consult with the affected property owners to establish a suitable mitigation strategy to be implemented.
	Metrolinx will continue ongoing consultations with the Country Day School (Mile 25.31) prior to construction and prior to construction to address crossing concerns and to address access to portions of the school property bisected by the ROW.
	Metrolinx will prepare a detailed safety assessment for each crossing and provide preliminary screening for improvement requirements for coordination and discussion with municipalities.
	As per requirements under the new Railway SMS Regulations, risk assessments will need to be conducted for stations, track and new layover facilities. Any changes affecting Rail Operations must have a risk assessment. All mitigations identified must be identified prior to the finalisation of any train schedules.
	Metrolinx will consult with affected transit corporations with regard to the detailed design.
	Metrolinx will continue to work with the City of Toronto to coordinate the design of the West Toronto Railpath Extension and the design of the proposed Bloor-Davenport GO Station.
Utilities and Municipal Infrastructure	Existing utility crossings and utilities present along the Barrie rail corridor will be further reviewed to determine protection or relocation/removal requirements to be included in the Construction Contract Documents. This will include consultation with the affected utility owner.
	The Subsurface Utility information will be cross-referenced to check for discrepancies in the utility record information. Any inconsistencies between the utility crossing agreement information and the utility investigation will be further investigated.
	During the detailed design phase of the Project, Metrolinx will look at opportunities to use low impact construction methodologies for structures including bridges and culverts, where feasible.
	Detailed structural investigations will be carried out for any identified culverts/structures to confirm condition, integrity and any potential modifications that may be required to accommodate the Project works.
	A Topographical Survey will be completed prior to construction to confirm existing clearance for any structures.
	Detailed Geotechnical Investigations will be completed prior to construction to confirm the structural integrity of the underlying soils and preliminary recommendations for foundation designs.
	A Designated Substances Survey for any buildings or structures that require demolition will be undertaken and this provision will be included in the Construction Contract Documents. Where these assessments identify the presence of designated substances, 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.

Table 7-2: Summary of Future Construction Commitments

Feature	Future Commitment
Natural Environment	
Significant Wildlife and Terrestrial Environment	A qualified Environmental Inspector will be present throughout the construction period to confirm that protection measures identified in the protocols and plans prepared prior to construction and included in the Construction Contract are implemented, maintained and enforced. This inspector is responsible for determining the need and timing of additional expertise, such as a Certified Arborist.
	The Vegetation Compensation Protocol for Metrolinx RER Projects will be implemented.
	Wetlands will be restored as necessary to maintain the stability and function of the wetland and will be developed in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects and approved landscaping plans developed prior to construction.
	In Valleylands, work on steep slopes will be limited to the extent possible.
	Clearing and grubbing will occur from the track-side of the natural area and a detailed ESC Plan will be developed to limit damage to the remaining natural areas.
	Any vegetation clearing will take place outside of the breeding bird timing window. 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 Ecologist confirms that the birds have fledged and the nest is no longer active.
	Implementation of any significant Osprey Nesting, Perching and Foraging mitigation e.g., installation of a nesting platform in an alternative location and removal of the existing nest outside of the breeding season.
	Disturbed areas of crayfish habitat will be restored to their original condition.
	If a nesting migratory bird or SAR be encountered, all work will cease within the immediate work area and the MNRF will be contacted within 48 hours or two business days.
	ESC measures will be implemented prior to construction and maintained during the construction phase in accordance with the ESC Plan. All disturbed areas of the construction site will be stabilized and re-vegetated as soon as conditions allow. Where re-vegetation is required, a native seed mix, which does not contain invasive species, will be used. .
	A herbicide application plan will be developed as required by the Contractor and will be submitted to the applicable conservation authority for review
	An Environmental Spills Prevention and Response Plan will be developed to ensure proper mitigation and notification procedures are in place regarding soil quality during BRCE Project construction. Hazardous or deleterious substances (including stockpiled material) will be used, stored and transported in a manner that prevents any of the substances from entering a natural feature.
	In accordance with the SMP, the Contractor will develop procedures for disposal of excavated material.
Aquatic	Wet weather restrictions will be applied during site preparation and excavation. Work will be avoided in areas of natural features during periods of excessive precipitation and/or excessive snow melt.
	All requirements under the Fisheries Act will be met including any Self-Assessments or permitting.
	All requirements under the OWRA, R.S.O. 1990, c. O.40 with respect to the quality of water discharging into natural receivers will be met.
	All in-water work will be conducted in accordance with the timing windows to be identified in the Aquatic Habitat Assessment.
Trees	TPZs will be established in accordance with the applicable municipal by-law; barriers will be installed around trees to be protected using plywood clad boarding or an equivalent material approved by the municipality; no stockpiles, storage or disturbance to grade will occur within the TPZ to minimize soil compaction and root damage.
	Butternut tree monitoring as determined by MNRF and Metrolinx will be conducted by a Certified Butternut Health Assessor.

Feature	Future Commitment
	Vegetation removal will be kept to a minimum and limited to within the construction footprint, where feasible. Silt fencing and/or protective tree barrier will be installed, where possible, and maintained to clearly define the construction footprint and prevent accidental damage to vegetation or intrusion to adjacent vegetated areas. The opportunity to salvage existing vegetation, particularly sensitive species, for transplanting from within the project boundaries will also be explored.
	A Certified Arborist will review for hazardous limbs and trees for removal prior to commencement of use of the second track. Trees will be trimmed by a qualified Professional to limit tree damage.
Cultural Environment	
Archaeological Resources	Known cemeteries will be protected and avoided by any BRCE Project effects, including a temporary barrier to be erected around the known extent of the cemetery and “no go” instructions issued for all on-site crews as a precautionary measure. This will apply to the following cemeteries: • Mt. Sinai Memorial Park (Mile 9.30); • Maple United Church Cemetery (Mile 18.18); • St. Paul’s Cemetery (59.18); and • Cemeteries associated with St. Helen’s Historic Church (Mile 3.35) and LeFroy United Church (Mile 51.92), if found as a result of Cemetery Investigations conducted prior to construction.
	To minimize the risk of impacting an ossuary during construction of the BRCE Project, a licenced consultant archaeologist will be present to monitor the removal of topsoil for all lands within the study area identified to possess potential for an ancestral Huron-Wendat ossuary. This applies to the following sites, as shown on Figures 32 to 53 in the Stage 1 Archaeological Assessment in Appendix C: • The Hope site (AlGv-199); and • Allandale site (Borden #BcGw-69).
	In the event that previously undocumented archaeological remains are found during land clearing, construction or any other ground disturbance activity, the proponent or person discovering the archaeological resources will cease all work or alteration of the site immediately, and the licenced consultant archaeologist, approval authority, and the Cultural Programs Unit of the Ministry of Tourism Culture and Sport (MTCS) will be immediately notified. If human remains are confirmed to be present, then local law enforcement and the Office of the Chief Coroner for Ontario will be immediately notified to review the discoveries and confirm that the site is not of forensic interest. Non-forensic findings will be subsequently communicated to the Cemeteries Registrar. Any documented human remains will be subjected to protection and avoidance by effects proposed by the BRCE Project.
Cultural Heritage Resources	Mitigation and monitoring measures from the HIAs/Strategic Conservation Plans and/or any municipal agreements will be implanted during the construction.
	Any tree removal on CHR properties will be compensated in accordance with the Vegetation Compensation Protocol for Metrolinx RER projects.
	Staging and construction activities will be suitably planned and undertaken to avoid impacts to identified CHRs to the extent practical.
	Post-construction landscaping and rehabilitation plans will be undertaken in a manner that is sympathetic to the overall setting with appropriate/sympathetic historic plant materials to the extent practical.
	If any topsoil is removed from lands acquired from the Smith property, located in Aurora and owned by the OHT, associated rehabilitation will include the use of clean topsoil which is free of weeds and invasive species.
Social and Built Environment	
Air Quality, Noise, and Vibration	BMPs will be implemented to control fugitive dust emissions, noise and vibration during construction.
	Dust from the work areas will be controlled through suppressants (e.g., water).
	The Contractor will develop noise and vibration monitoring plans prior to construction.

Feature	Future Commitment
	The Contractor will develop a preventative and mitigation protocol for impacts including a complaint response protocol for dust, noise and vibration emissions that may be caused during construction. The complaint response protocol will include a plan outlining how the public is to be notified of their options for lodging a complaint.
	Noise barriers will be constructed to mitigate noise effects to sensitive areas.
	Ballast mats or similar vibration mitigation measures will be constructed to mitigate vibration effects to sensitive areas.
	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.
	Construction activities that are expected to be particularly noisy will be scheduled 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 by Metrolinx in advance.
Traffic and Transportation Infrastructure	Metrolinx will provide advance notification of construction works to affected municipalities, adjacent owners, transit companies, school bus companies, emergency service providers and the general public to inform them of the timing and duration of construction activities including anticipated road, trail and/or lane closures, and detour routes to avoid the work zone, for example.
	The contractor will evaluate and assess construction methods and staging commitments. Construction activities will be scheduled and staged to avoid impacts to existing train schedules to the extent possible.
	Metrolinx will notify private owners of rail operations to allow for coordination of crossing times.
Utilities and Municipal Infrastructure	Pre-construction and post-construction surveys of buildings, structures and railway protection and monitoring will be undertaken.
	Protection and relocation of utilities.
	The Contractor will develop procedures for disposal of excavated materials, including contaminated soils, in accordance with the MOECC requirements.
	The Contractor will evaluate and assess construction methods and staging to minimize potential impacts to the surrounding properties and develop mitigation plans in consultation with technical agencies, emergency service providers and the public.
	The Contractor will evaluate and assess construction methods and staging to minimize potential impacts to the surrounding properties and develop mitigation plans in consultation with technical agencies, emergency service providers and the public.

7.2.1 *Future Consultation*

Future consultation commitments to be carried by Metrolinx prior to construction phase include:

- Consultation with rail authorities (e.g., CPR, CNR and BCRY) and affected transit corporations (e.g., TTC, YRT).
- Continued consultation with the public, adjacent property owners, business owners, emergency service providers, local councillors and other key stakeholders.
- Continued review, consideration and discussion with the Town of Bradford West Gwillimbury, MNRF, LSRCA and other stakeholders during the next phases of the Project with respect to an alternative site for the Bradford Layover Facility located on the east side of the rail corridor at the Line 9 level crossing in the Town of Bradford West Gwillimbury.
- Consult and coordinate work with ongoing municipally-led Class EAs and/or other planned infrastructure projects that may impact or be impacted by the BRCE Project.
- Consult and coordinate work with other ongoing Metrolinx Projects teams including but not limited to Davenport Diamond Grade Separation, Caledonia GO Station, and Downsview Park GO Station, Rutherford Road Grade Separation, Barrie Layover Facility Expansion, and Bradford GO Station Temporary Layover.

7.3 Addendum Process

The TPAP includes provisions in Section 15 of O. Reg. 231/08 for proponents to make changes to a transit project after the Statement of Completion is submitted to the Director, EAB at the MOECC, and the Regional Director, Central Region Office of the MOECC. In compliance with Section 15(1) of the Regulation, Metrolinx will prepare an addendum to the EPR if there is a proposed change to the BRCE Project that is inconsistent with the EPR after the Statement of Completion is issued. Changes that are inconsistent with the EPR generally include changes where the potential environmental effects were not originally addressed in the EPR. If the proposed change would result in a lesser impact than planned for and meets the mitigation intents identified in the EPR, it may be deemed to be consistent with the EPR and therefore no addendum is required.

Changes to the BRCE Project may also be required if there is a significant lapse of time (e.g., ten years or greater) between the Notice of Completion and the start of construction. In this instance, a formal review of the BRCE Project will be carried out by Metrolinx (in accordance with Section 16 of O. Reg. 231/08) to consider changes that have taken place since submission of the Statement of Completion. These changes could include new conditions in the study area, new engineering standards that could affect the preferred design, or new technologies for mitigation measures, for example.

In the event, Metrolinx determines that an addendum is required; a Notice of EPR Addendum will be placed in pertinent local newspapers, and posted on the Metrolinx Website. In addition, the Notice must also be provided to the Director (EAB), the Regional Director (MOECC Central Region Office), every property owner within 30 metres of the site of the change, Aboriginal communities that were given a Notice of Commencement, and any other person who Metrolinx believes may be interested in the change to the project. The EPR addendum must include the following information:

- A description of the proposed change;
- The reason for the proposed change;
- An assessment and evaluation of any impacts that the proposed change might have on the environment;
- A description of any proposed measure for mitigating any negative effects that the proposed change might have on the environment; and
- A statement of whether the proponent (Metrolinx) is of the opinion that the proposed change is significant (or not), and the reasons for the opinion.

It is noted that if changes to the BRCE Project indicate that an addendum is required, Metrolinx may choose to proceed with the Project changes in accordance with Part II of the EAA. Moreover, the requirement for an addendum does not apply to a change that is required to comply with another Act, a regulation made under another Act, or an order, permit, approval or other instrument issued under another Act.

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