

LAKESHORE EAST RAIL CORRIDOR EXPANSION (DON RIVER TO SCARBOROUGH GO STATION) PROJECT ENVIRONMENTAL PROJECT REPORT

VOLUME 1
MAIN REPORT

September 2017



Distribution List

# Hard Copies	PDF Required	Association / Company Name
	✓	Metrolinx
	✓	AECOM Canada Ltd.

Statement of Qualifications and Limitations

The attached Report (the “Report”) has been prepared by AECOM Canada Ltd. (“AECOM”) for the benefit of the Client (“Client”) in accordance with the agreement between AECOM and Client, including the scope of work detailed therein (the “Agreement”).

The information, data, recommendations and conclusions contained in the Report (collectively, the “Information”):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the “Limitations”);
- represents AECOM's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to AECOM which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

AECOM shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. AECOM accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

AECOM agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but AECOM makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable construction costs or construction schedule provided by AECOM represent AECOM's professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Since AECOM has no control over market or economic conditions, prices for construction labour, equipment or materials or bidding procedures, AECOM, its directors, officers and employees are not able to, nor do they, make any representations, warranties or guarantees whatsoever, whether express or implied, with respect to such estimates or opinions, or their variance from actual construction costs or schedules, and accept no responsibility for any loss or damage arising therefrom or in any way related thereto. Persons relying on such estimates or opinions do so at their own risk.

Except (1) as agreed to in writing by AECOM and Client; (2) as required by-law; or (3) to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by Client.

AECOM accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information (“improper use of the Report”), except to the extent those parties have obtained the prior written consent of AECOM to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

AECOM: 2015-04-13

© 2009-2015 AECOM Canada Ltd. All Rights Reserved.

Authors



Report Prepared By:

Corinne Latimer, M.Sc., MCIP, RPP
Senior Environmental Planner



Report Reviewed By:

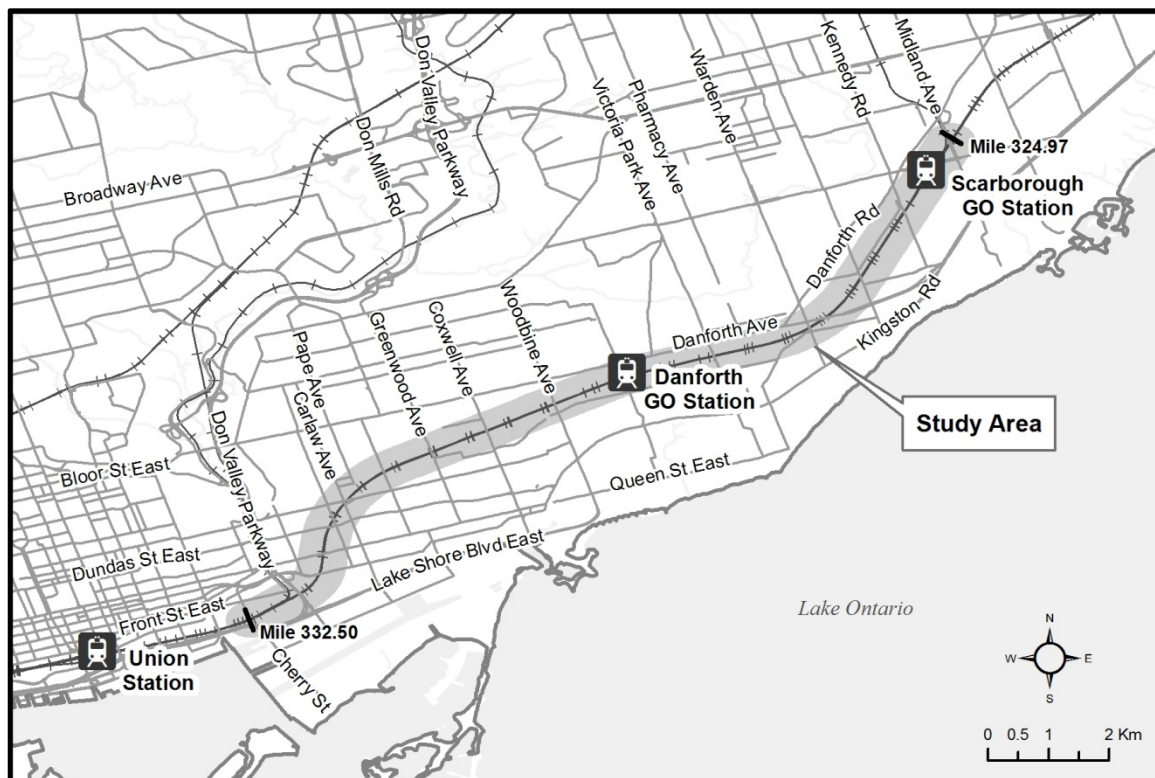
Ayhem Sadie, P.Eng.
Senior Railway Project Manager

Executive Summary

Project Overview

Metrolinx is completing a Transit Project Assessment Process (TPAP) under *Ontario Regulation (O. Reg.) 231/08, Transit Projects and Metrolinx Undertakings* (Transit Projects Regulation). The Lakeshore East Rail Corridor Expansion (Don River to Scarborough GO) Project (referred to herein as the Project) involves the addition of a fourth railway track and associated bridge widenings and culvert modifications on the Lakeshore East Rail Corridor between the Don River and the Scarborough GO Station. The 12 kilometre (km) Study Area, shown in **Figure ES-1** below, is defined as the segment of Lakeshore East Rail Corridor between the west boundary (north of the Don Yard, east of Cherry Street, west of the Don River) at Mi. 332.5 and the east boundary (Midland Avenue, east of Scarborough GO Station) at Mi. 324.97.

Figure ES-1: Study Area



The purpose of the Project is to improve accommodations on the Lakeshore East Rail Corridor as Metrolinx moves forward with the service expansions associated with the GO Expansion Program. Building on the 30-minute off-peak service introduced in June 2013, Metrolinx is moving forward with the GO Expansion Program, a program that will provide new travel choices on the GO Transit network across the Greater Toronto and Hamilton Area (GTHA), including a 15-minute electrified service in core areas. As such, train movements will continue to increase on the Lakeshore East Rail Corridor as more frequent service is introduced.

The EPR documents the findings of the TPAP with respect to existing environmental conditions, potential effects assessment, associated mitigation and monitoring, stakeholder and public consultation, and commitments to future work.

Study Process

The TPAP is a proponent-driven, self-assessment process that provides a defined framework for the proponent to follow in order to complete the accelerated assessment of the potential environmental effects and decision-making within a 120-day regulated assessment timeline, shown in **Figure 2-1** of this EPR. Following this period, the regulation provides an additional 30-day public review, followed by a 35-day Ministry of the Environment and Climate Change (MOECC) review.

In advance of the TPAP commencement, Metrolinx undertook introductory activities (such as studies for existing environmental conditions) and consultation through Pre-Planning Activities. The TPAP was officially initiated on May 18, 2017 through the 'Notice of Commencement and Public Meeting #2', commencing the regulated 120-day timeframe.

Further details describing the TPAP requirements, activities, and associated timelines are provided in **Section 2** of this EPR.

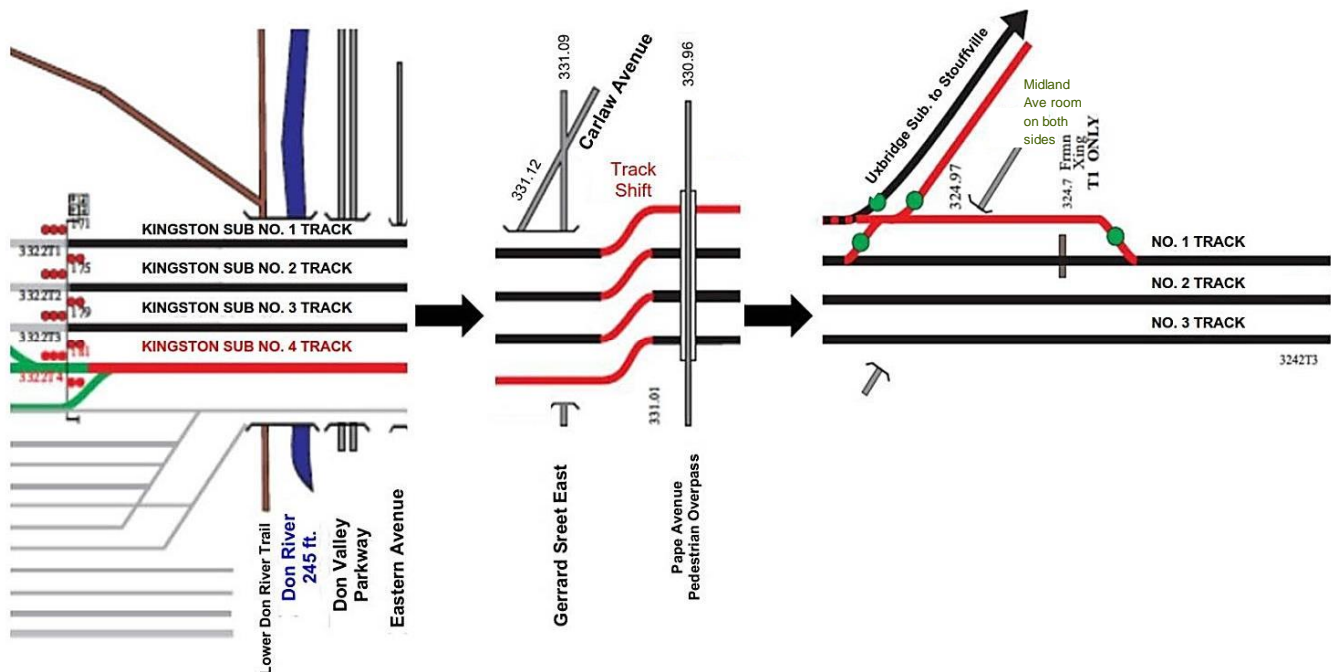
Project Description

The main elements of the preferred design include:

- Addition of a fourth track between the Don River Bridge and the Scarborough GO Station;
- The expansion will occur on the south side of the existing rail tracks between the Don River Bridge and Gerrard Street East, shifting to the north side of the existing rail tracks between Pape Avenue and Scarborough GO Station (see **Figure ES-2** below);
- Widening of bridges at Woodbine Avenue, Warden Avenue and Danforth Avenue;
- Modifying underneath the Birchmount Road Bridge;
- Modifications at Danforth GO Station;
- Retaining walls;
- Noise and vibration mitigation measures; and,
- Three (3) culvert modifications: east of Coxwell Avenue at Small's Creek (Mi. 329.50), east of Kennedy Rd. (Mi. 325.74) and Scarborough Junction (Mi. 325.55).

Further details describing the Project components are provided in **Section 3** of this EPR.

Figure ES-2: Simplified Track Shift Diagram



Assessment of Potential Effects and Proposed Mitigation Measures

The Project has the potential to create environmental condition changes, which may result in both positive and negative effects. These condition changes will be considered through consultation with the public and stakeholders throughout the Pre-Planning Activities and TPAP. Following the identification of existing conditions, an assessment of potential effects and proposed mitigation measures is completed based on the following information:

- An assessment and evaluation of the potential effects that the Project may have on the environment;
- A description of any measures proposed to mitigate any negative effects that the Project may have on the environment; and,
- A description of the means to monitor or verify the effectiveness of the proposed mitigation to reduce or eliminate adverse effects.

Below is a summary of the key findings of the technical studies. Details describing the potential effects and proposed mitigation measures are provided in **Section 5** of this EPR.

Terrestrial Features

Vegetation removal will occur during the dormant months for vegetation (recommended between November 1 and March 31 of any year) and will be kept to a minimum and limited to within the construction footprint. Where possible, stockpile materials and construction equipment will be stored within the construction footprint. Separate laydown and staging areas will likely be required which will be determined during Detailed Design. As laydown and staging areas are identified they will be subject to further environmental due diligence, as required. Construction fencing and/or silt fencing, will be installed, and maintained to clearly define the construction footprint and prevent accidental damage to vegetation or intrusion to adjacent vegetated areas. Construction fencing and/or silt fencing will be monitored and repaired as necessary throughout the construction period.

A planting plan will be either developed in consultation with the City of Toronto and/or the TRCA, or provided as a standardized approach developed by Metrolinx in consultation with the agencies. Permits and approvals related to City of Toronto Tree By-laws and municipal tree injury/removal permits will be obtained as required. On-site inspection will be undertaken as required during construction by a qualified Arborist to ensure that only specified trees are removed, fencing is intact and there is no damage caused to the remaining trees and adjacent vegetation communities. Further details describing potential effects and mitigation with respect to vegetation are provided in **Section 5.1.1** of this EPR.

No wetlands were identified within the Study Area that could be potentially affected by the Project.

Of the bats identified to potentially occur within the Greater Toronto Area (GTA), four (4) SAR are listed as Endangered and they and their habitats are protected under the Endangered Species Act (ESA), including Eastern Small-footed Bat, Little Brown Bat, Northern Long-eared Bat, and Tri-colored Bat. Snag surveys are to be completed, subject to scope of work developed in consultation with Ministry of Natural Resources and Forestry (MNRF) during Detailed Design, in all forest and swamp communities where vegetation removal is proposed. Surveys will be conducted following the *Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis and Tri-coloured Bat* (MNRF, 2017) or as amended through consultation with MNRF regarding the scope of work. According to this protocol, any treed forest or swamp ecosites that include snags with DBH of at least 10 cm shall be considered suitable bat maternity roost habitat. Tree removal in suitable bat maternity roost habitat identified through snag surveys, shall be scheduled to occur outside of the bat roosting season and further mitigation measures and monitoring may be required based on the results of additional surveys and consultations with the MNRF. Further details describing potential effects and mitigation with respect to SAR are provided in **Section 5.1.1** of this EPR.

All works must be completed in compliance with the *MBCA*. Timing for the breeding bird season varies by habitat and weather conditions. Vegetation removal should be scheduled to occur outside of May 1st to August 15th. If vegetation must be removed between May 1st and August 15th, nest and nesting activity searches will be conducted by a qualified Biologist no more than 24 hours prior to vegetation removal. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (OBBA, 2001). See **Section 5.1.1.4** for additional mitigation.

Vegetation removal required for construction (i.e., staging) may be required in areas outside of the Lakeshore East Rail Corridor; while impacts to Deciduous Forest (FOD) (containing SAR or SOCC plant species) and designated natural heritage features (e.g., Ravine and Natural Feature Protection areas) cannot be completely avoided, design refinements will be considered during Detailed Design to reduce impacts to FOD and natural heritage features where possible. See **Section 5.1.1.5** for further detail.

Background reviews indicated the potential for Butternut (along with several regionally rare plant species) to occur within the Study Area; however, Butternut was not observed during field investigations completed in July 2016. If Butternuts are identified during Detailed Design within 50 m of the Lakeshore East Rail Corridor, a sample shall be taken from each individual for genetic testing to determine purity/hybridity.

Aquatic Features

The use of machinery in or around water poses risks of fuel contamination and spills from equipment during construction and operation which can potentially limit the ability of aquatic species to carry out their life processes. Mitigation measures include planning in-water works in accordance with the warm water timing window (July 1st until March 31st), implementing measures to contain and stabilize any waste material (a site specific Spill Prevention and Response Plan) and implementing an Erosion and Sediment Control Plan to minimize the risk of sedimentation to the waterbody during all phases of construction.

The need for in- or near-water works will be determined during Detailed Design. Based on Preliminary Design, it is anticipated that in- or near-water works may be required at Small's Creek. And as such, a Fisheries and Oceans Canada (DFO) Self-Assessment under the *Fisheries Act* will be undertaken by a qualified professional to determine appropriate mitigation measures and to confirm whether further assessment and review is required by DFO.

Further details describing potential effects and mitigation with respect to aquatic features are provided in **Section 5.1.2** of this EPR.

Soils and Groundwater

Potential effects due to the disturbance of existing contaminated sites and the release of contaminants could include reduction in soil quality due to accidental release of contaminants during construction. There is also the potential for sediments to enter watercourses as a result of site clearing, stockpiling, cut/fill activities, excavation and construction activities.

On- and off-site beneficial reuse of excess soil will be explored by the Project team and will be undertaken in accordance with *Excess Soil – A Guide to Best Management Practices* (MOECC, January 2014).

All contaminated materials will be handled according to applicable legislation, regulations and standard procedures.

Phase I Environmental Site Assessments (ESAs) will be completed for additional lands (permanent and temporary) required for the Project during the Detailed Design phase. Additional studies and mitigation will be implemented as warranted based on the findings of those investigations.

The following plans will be developed and implemented to mitigate potential construction effects: Erosion and Sediment Control Plan, Waste Management Plan, Soil Management Plan, Health and Safety Plan, and Spill Prevention and Response Plan.

Appropriate best management practices (e.g., spill prevention and response) will be implemented during operations and maintenance to mitigate potential impacts to soil and groundwater.

Further details describing the anticipated soils and groundwater effects and how they will be mitigated are provided in **Section 5.2** of this EPR.

Air Quality

Based on the Air Quality Baseline Conditions Report (provided in **Appendix B2A**), six (6) GO Transit Rail Corridors were assessed for potential effects in support of the Electrification TPAP, including the Lakeshore East Rail Corridor. The Air Quality Impact Assessment Report (provided in **Appendix B2B**) found that potential construction effects are minimal due to their temporary nature. A Dust Control Plan will be developed for implementation during construction. The impact assessment also found that electrification of the Lakeshore East Rail Corridor will result in reduced emissions once implemented. Further details describing the anticipated air quality effects and how they will be mitigated are provided in **Section 5.3** of this EPR.

Noise and Vibration

The Noise and Vibration Modelling Report (**Appendix B3**) evaluated the six (6) GO Transit Rail Corridors, including the Lakeshore East Rail Corridor, in support of the Electrification TPAP. The Report found that noise and vibration impacts are temporary in nature and largely unavoidable by implementing appropriate mitigation. A Construction Noise Management Plan and a Construction Vibration Mitigation and Monitoring Plan will be developed prior to construction, along with a complaint protocol for adjacent property owners. Project-specific noise and vibration

mitigation (e.g., noise barriers, rail dampeners and/or resilient wheels) will be further investigated based during Detailed Design. Further details describing the anticipated noise and vibration effects and how they will be mitigated are provided in **Section 5.4** of this EPR.

Socio-Economic and Land Use

The entire Study Area is subject to the planning policies of the City of Toronto Official Plan. The Study Area is currently comprised of predominantly low- and medium-density residential housing, institutional, and recreational land uses. Further details describing applicable planning policies, key socio-economic features, and the existing character of the Study Area are provided in **Section 4.5** of this EPR.

Pedestrian and cyclist access to recreational uses and parks and open spaces is not anticipated to be impacted during construction; however, construction equipment and activities may result in temporary aesthetic effects. In addition, retaining walls will be required in some locations and will result in some tree/vegetation removal. Retaining walls that may be notable from a public realm perspective will be reviewed by the Metrolinx Design Review Panel (MDRP). Property requirements for portions of public parkland will be confirmed during Detailed Design. Metrolinx is establishing a Vegetation Compensation Protocol for Metrolinx Regional Express Rail (RER) projects and vegetation that is removed will be compensated for in accordance with the provisions of this protocol:

- **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 along long stretches of 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 community types/ ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final 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).

Specific property requirements will be determined during Detailed Design. Ongoing consultation with affected landowners will help to identify appropriate site-specific mitigation measures. Effects on adjacent property owners related to construction activities are discussed under **Sections 5.3, 5.4 and 5.6**.

The construction associated with the Project will also result in direct and indirect economic benefits. Construction activities will create new employment opportunities and construction workers will provide some additional revenue opportunities to local businesses with respect to various supplies required and restaurant/food establishments.

Further details describing the anticipated socio-economic effects and how they will be mitigated are provided in **Section 5.5** of this EPR.

Traffic and Transportation

A Traffic Impact Study (see **Appendix B5**) showed that the potential effects of the bridge widening construction at each of the relevant bridge widening locations (Woodbine Avenue, Warden Avenue, and Danforth Avenue) will remain local. The construction staging conditions implemented at the bridge locations will not have a major effect on the roadway operations with respect to queues.

Potential effects to pedestrian and cycling activities during construction will be mitigated through the installation of appropriate way-finding, regulatory, and warning signs.

The Toronto Transit Commission (TTC) will be engaged through construction meetings and advance notification of construction works will help TTC to determine if extra service, or service modification, is required.

No further mitigation measures are required during operations as no effects are anticipated.

Further details describing the anticipated traffic impacts and how they will be mitigated are provided in **Section 5.6** of this EPR.

Cultural Heritage

A Cultural Heritage Screening Report (CHSR) was conducted to identify properties within the Study Area with recognized or potential cultural heritage value or interest. The results of the CHSR identified thirteen (13) Built Heritage Resources. As part of the evaluation, it was determined that two (2) of the potential heritage properties were identified to have potential direct impacts and (11) potential heritage properties were identified to have potential indirect impacts. Cultural Heritage Evaluation Reports (CHERs) were completed for the directly impacted properties: Carlaw Avenue Subway and Gerrard Street East Subway. It was determined that both properties met the criteria in O. Reg. 9/06 and have been identified as Provincial Heritage Properties. Although the effects are not expected to be negative, Heritage Impact Assessments (HIAs) are recommended for these properties. CHERs for the remaining eleven (11) potentially indirectly impacted properties will be completed during Detailed Design. The CHSR also recommended HIAs for the two (2) identified HCDs, the Designated Riverdale HCD and the Proposed Queen Street East HCD to be completed during Detailed Design. CHERs and HIAs completed during Detailed Design will be provided to the Ministry of Tourism, Culture and Sport (MTCS) by Metrolinx.

Further details describing the anticipated cultural heritage effects and how they will be mitigated are provided in **Section 5.7** of this EPR.

Archaeology

The findings of the Stage 1 Archaeological Assessment (AA) determined that portions of the Study Area retain the potential for archaeological discoveries and therefore, a Stage 2 AA will be completed during Detailed Design. Should previously unknown or unassessed archaeological resources be uncovered during construction activities, these lands may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological field work in compliance with Section 48 (1) of the *Ontario Heritage Act*.

Further details describing the anticipated effects to archaeological resources and how they will be mitigated are provided in **Section 5.8** of this EPR.

Climate Change and Sustainability

Section 6 of this EPR provides an overview of climate change and its potential effects on the Project. Metrolinx has developed a Five Year Strategy 2015-2020 that outlines priorities and objectives that provide a framework to guide work in all parts of the organization. Modifications to Project design/design solutions may be appropriate to reduce vulnerability to changes in some of the climate/weather parameters noted herein.

Upon future electrification of the Lakeshore East Rail Corridor, Metrolinx will also follow the mitigation measures identified as part of the Electrification Project.

Consultation Process

Metrolinx offers a wide range of methods to communicate with the general public, review agencies, property owners, Indigenous communities, and other interested groups. The following forums and activities will be used to provide updates and solicit comments and feedback on the Project:

- | | |
|--|------------------------------------|
| ▪ Project Website | ▪ Agency E-mail Distribution List |
| ▪ Stakeholder Meetings | ▪ Project E-mail Distribution List |
| ▪ Public Meetings | ▪ Mailings |
| ▪ Notifications/Newspaper Advertisements | ▪ Meetings with Elected Officials |

The Project Website (www.metrolinx.com/DonRiverScarborough) was implemented and dedicated to keep the public up-to-date on the latest developments of the Project, provide notice of Public Meetings held in November 2016 and June 2017, serve as a virtual library to document materials presented at Public Meetings and other Project documentation, and provided a means for the public to comment on the Project.

Metrolinx held two (2) rounds of Public Meetings at locations in the City of Toronto, which were promoted through local newspaper advertisements, as well as e-mail, addressed mail (within approximately 30 m of the Study Area) or unaddressed admail to local residents (between 30 m to 200 m via unaddressed admail), technical review agencies, identified stakeholder groups, and Indigenous communities (via e-mail and addressed mail). These Public Meetings provided an opportunity for the public to speak directly with Metrolinx and the Project team. The results of the Public Meetings are summarized in **Section 7.1.3** and **Appendix C** of this EPR.

In addition, Metrolinx is conducting stakeholder outreach and consultation through meetings and workshops with provincial and municipal review agencies, Indigenous communities, adjacent property owners, and community groups. Individual briefings have also been, and will continue to be, held with the City of Toronto to provide progress updates pertaining to specific Project interests. The objective and outcomes of these stakeholder meetings are summarized in **Section 7.2** of this EPR.

Key milestones of the TPAP include the Notice of Commencement and Notice of Completion, which inform stakeholders of the 120-day regulated assessment timeline commencement and subsequent study completion when the EPR is made available for stakeholder, including public, review and comment. These notices are sent by e-mail to the MOECC Special Project Officer, MOECC Environmental Approvals Branch Director, and MOECC Environmental Approvals Branch Regional Director. The Notice of Completion was issued to the public on September 14, 2017 and published in local newspapers. The Notice of Completion was also posted to the Project Website and at the Danforth and Scarborough GO Stations from September 13, 2017 until October 16, 2017. The Notice of Completion was also e-mailed to stakeholders (including property owners on the Project Mailing List, government review agencies and Indigenous communities) and attendees of PM #1 and #2, where e-mail was available. Property owners within 30 m of the Study Area and Indigenous communities were sent addressed mail while property owners between 30 m to 200 m were sent unaddressed admail.

Addendum Process

An addendum to the EPR may be required if Project developments result in any design variations from what was assessed in this EPR during the approvals, Detailed Design, and construction processes. The TPAP includes provisions in *O. Reg. 231/08* for proponents to make changes to a transit project after the Statement of Completion is submitted to the Director of the Environmental Assessment and Approvals Branch of the MOECC and the MOECC Regional Director. In compliance with *O. Reg. 231/08*, Metrolinx will prepare an addendum to the EPR if there is a proposed change to the Project that is inconsistent with the EPR after the Statement of Completion is issued. Further details describing the EPR addendum process and requirements are provided in **Section 8.3** of this EPR.

Future Commitments and Monitoring

O. Reg. 231/08 requires future commitments, including required permits and approvals, to be documented as part of the TPAP to facilitate Project implementation in accordance with the Project-specific mitigation measures and monitoring activities described in this EPR to ensure the Project does not result in negative impact on matters of provincial interest related to the natural environment, cultural heritage value or interest, or constitutionally protected Indigenous or treaty rights. All applicable permits, licenses, approvals, and monitoring requirements under environmental laws will be reviewed, confirmed, and obtained during the applicable phase of the Project implementation (e.g., Detailed Design, construction). A complete table of future commitments is provided in **Table 8-1** of this EPR.

An Environmental Mitigation and Monitoring Plan (EMMP) will be developed to outline the responsibility for carrying out monitoring and reporting activities, including timing and frequency of monitoring activities, as well as the compliance process. The EMMP will include all mitigation measures, categorized by project phase, and will identify the party responsible for implementation.

Table of Contents

	page
1. Introduction.....	1
1.1 Project Overview.....	1
1.2 Purpose of the Transit Project.....	2
1.3 Description of the Study Area	3
1.4 Overview of Environmental Project Report (EPR)	4
2. Study Process.....	5
2.1 Transit Project Assessment Process (TPAP)	5
2.1.1 Pre-Planning Activities.....	5
2.1.1.1 Existing Environmental Conditions	5
2.1.1.2 Public and Stakeholder Consultation	7
2.1.2 Key Steps of the TPAP.....	7
2.1.3 Environmental Project Report.....	8
2.1.4 Objection Process, Minister's Review and Statement of Completion	8
3. Project Description.....	9
3.1 Existing Rail Infrastructure	9
3.2 Key Design Criteria.....	10
3.2.1 Track Spacing and Clearances.....	10
3.2.2 Design Speed.....	10
3.2.3 Construction Laydown and Staging Areas	13
3.2.4 Trackwork.....	13
3.2.5 Retaining Walls and Grading.....	13
3.2.6 Electrification Accommodations.....	13
3.3 Preferred Track Alignment	13
3.3.1 Description of the Preferred Alignment.....	14
3.4 Existing Grade Separation Structures	15
3.5 Bridges	15
3.5.1 Birchmount Road Bridge	15
3.5.2 Danforth Avenue Bridge	16
3.5.3 Warden Avenue Bridge	16
3.5.4 Woodbine Avenue Bridge.....	16
3.6 Culverts	16
3.7 Stations.....	17
3.8 Utilities.....	17
3.9 Property Impacts.....	17
4. Existing Conditions.....	19
4.1 Natural Environment	19
4.1.1 Methods	19

4.1.2	Designated Features	20
4.1.2.1	Provincially and Locally Significant Wetlands.....	20
4.1.2.2	Areas of Natural and Scientific Interest.....	20
4.1.2.3	Environmentally Significant Areas	20
4.1.2.4	Conservation Authority Regulated Areas	22
4.1.2.5	Terrestrial Natural Heritage Target System – Toronto and Region Conservation Authority	22
4.1.2.6	City of Toronto Official Plan – Natural Heritage System	22
4.1.2.7	Ravine and Natural Feature Protection By-law – City of Toronto.....	23
4.1.2.8	Vegetation Compensation Protocol	23
4.1.3	Naturalized Areas and Vegetation Communities.....	23
4.1.3.1	Ecological Land Classification Communities	23
4.1.3.2	Vascular Plant Inventory	24
4.1.4	Wildlife and Wildlife Habitat	24
4.1.4.1	Herpetofauna	24
4.1.4.2	Breeding Birds	26
4.1.4.3	Mammals	26
4.1.4.4	Wildlife Habitat.....	27
4.1.4.5	Terrestrial Species at Risk and Species of Conservation Concern	31
4.1.5	Fish and Fish Habitat	35
4.1.5.1	Watershed Description.....	35
4.1.5.2	Existing Watercourse Crossings.....	35
4.1.5.3	Aquatic Species at Risk (SAR) and Species of Conservation Concern (SOCC).....	37
4.2	Soils and Groundwater	39
4.2.1	Methods	39
4.2.2	Geological Setting	39
4.2.2.1	Topography and Physiography.....	39
4.2.2.2	Overburden Geology.....	39
4.2.2.3	Bedrock Geology	40
4.2.3	Existing Hydrogeological Setting	40
4.2.4	Groundwater Resources.....	40
4.2.5	Depth to Groundwater Table	41
4.3	Air Quality	41
4.3.1	Methods	41
4.3.2	Existing Conditions.....	45
4.4	Noise and Vibration.....	45
4.4.1	Methods	45
4.4.1.1	Receptors	46
4.4.1.2	Noise	46
4.4.1.3	Vibration	47
4.4.2	Existing Conditions.....	47
4.4.2.1	Existing Service Rail Traffic.....	47
4.4.2.2	Receptors	47
4.4.2.3	Noise	48
4.4.2.4	Vibration	48
4.5	Socio-Economic and Land Use.....	48
4.5.1	Methods	48
4.5.2	Planning Context.....	48

4.5.2.1	City of Toronto Official Plan (June, 2015)	48
4.5.3	Existing Land Use	56
4.5.3.1	Neighbourhoods	57
4.5.3.2	Residential	57
4.5.3.3	Commercial	57
4.5.3.4	Institutional	58
4.5.3.5	Employment	58
4.5.3.6	Recreational	58
4.5.3.7	Parks and Open Spaces	59
4.5.4	Planned Land Use	59
4.6	Traffic and Transportation	59
4.6.1	Traffic Volumes and Operations in Study Area	59
4.6.2	Active Transportation Patterns and Volumes at Danforth GO Station	61
4.6.3	Public Transit Service	62
4.7	Utilities	62
4.8	Cultural Environment	63
4.8.1	Cultural Heritage	63
4.8.1.1	Methods	63
4.8.1.2	Findings	63
4.8.2	Archaeology	64
4.8.2.1	Methods	64
4.8.2.2	Known Archaeological Sites	65
4.8.2.3	Archaeological Potential Analysis	65
5.	Assessment of Potential Effects and Proposed Mitigation Measures	69
5.1	Natural Environment	70
5.1.1	Terrestrial Features	70
5.1.1.1	Vegetation Cover and Designated Natural Areas	70
5.1.1.2	Wetlands	72
5.1.1.3	Wildlife Habitat	72
5.1.1.4	Breeding Birds	73
5.1.1.5	Terrestrial Species at Risk and Special Concern Species	74
5.1.2	Aquatic Features	77
5.1.2.1	Potential Construction Effects	77
5.1.2.2	Potential Operational Effects	77
5.1.2.3	Mitigation	77
5.2	Soils and Groundwater	78
5.2.1	Potential Construction Effects	78
5.2.2	Potential Operations Effects	79
5.2.3	Mitigation	79
5.3	Air Quality	80
5.3.1	Potential Construction Effects	81
5.3.2	Potential Operations Effects	81
5.3.3	Mitigation	82
5.4	Noise and Vibration	85
5.4.1	Potential Construction Effects	86
5.4.1.1	Noise	86

5.4.1.2	Vibration	86
5.4.2	Potential Operations Effects	88
5.4.2.1	Noise	88
5.4.2.2	Vibration	88
5.4.3	Mitigation.....	90
5.4.3.1	Noise	90
5.4.3.2	Vibration	91
5.5	Socio-Economic and Land Use	100
5.5.1	Residential, Commercial and Institutional Uses.....	100
5.5.1.1	Potential Construction Effects.....	100
5.5.1.2	Potential Operations Effects.....	100
5.5.1.3	Mitigation	100
5.5.2	Recreational Uses, Parks and Open Spaces.....	101
5.5.2.1	Potential Construction Effects.....	101
5.5.2.2	Potential Operations Effects.....	101
5.5.2.3	Mitigation	101
5.5.3	Aesthetics.....	102
5.5.3.1	Potential Construction Effects.....	102
5.5.3.2	Potential Operations Effects.....	102
5.5.3.3	Mitigation	102
5.5.4	Utilities	103
5.5.4.1	Potential Construction Effects.....	103
5.5.4.2	Potential Operations Effects.....	103
5.5.4.3	Mitigation	103
5.5.5	Property	103
5.5.5.1	Potential Construction Effects.....	103
5.5.5.2	Potential Operations Effects.....	104
5.5.5.3	Mitigation	104
5.5.6	Planned Land Use.....	105
5.5.6.1	Potential Construction Effects.....	105
5.5.6.2	Potential Operations Effects.....	105
5.5.6.3	Mitigation	105
5.6	Traffic and Transportation	105
5.6.1	Potential Construction Effects.....	105
5.6.2	Potential Operations Effects	107
5.6.3	Mitigation.....	107
5.7	Cultural Heritage.....	107
5.7.1	Potential Effects	107
5.7.2	Mitigation.....	108
5.8	Archaeology.....	109
5.8.1	Potential Effects	109
5.8.2	Mitigation.....	110
6.	Climate Change and Sustainability	111
6.1	Potential Effects of Climate Change on the Project.....	111
6.2	Sustainability.....	113
7.	Consultation Process.....	114

7.1	Consultation Activities.....	114
7.1.1	Project Website	114
7.1.2	Stakeholder Meetings.....	114
7.1.3	Public Meetings.....	114
7.1.3.1	Public Meeting #1	114
7.1.3.2	Public Meeting #2	116
7.1.4	Notice of Commencement	118
7.1.5	Circulation of Draft Environmental Project Report.....	118
7.1.6	Notice of Completion of Environmental Project Report	119
7.2	Consultation with Review Agencies and Stakeholders	119
7.2.1	Metrolinx Design Review Panel	122
7.3	Consultation with the Public.....	123
7.4	Consultation with Indigenous Communities.....	123
7.5	Consultation with Elected Officials and Community Organizations.....	126
7.6	Ongoing Engagement	129
8.	Future Commitments and Monitoring	131
8.1	Canadian Environmental Assessment Act 2012 (CEAA 2012) Review	131
8.2	Permits and Approvals Required.....	131
8.2.1	Federal.....	131
8.2.1.1	Fisheries and Oceans Canada	131
8.2.1.2	Transport Canada	132
8.2.2	Provincial	132
8.2.2.1	Ministry of the Environment and Climate Change	132
8.2.2.2	Ministry of Natural Resources and Forestry	132
8.2.2.3	Ministry of Tourism, Culture and Sport.....	133
8.2.3	Timing Windows and Preventative Measures	133
8.2.4	Municipal.....	134
8.2.4.1	Toronto and Region Conservation Authority	135
8.2.4.2	Utilities.....	135
8.3	Addendum Process.....	135
8.4	Future Commitments	136
9.	References	150

List of Figures

Figure 1-1:	Study Area.....	3
Figure 2-1:	Transit Project Assessment Process	6
Figure 3-1A:	Existing and Proposed Rail Infrastructure within the Study Area	11
Figure 3-1B:	Existing and Proposed Rail Infrastructure within the Study Area	12
Figure 3-2:	Simplified Track Shift Diagram	14
Figure 4-1:	Terrestrial Natural Heritage Background Review	21
Figure 4-2:	Aquatic Features.....	38
Figure 4-3:	Air Quality Baseline Conditions Study Area	42
Figure 4-4:	Air Quality Monitoring Stations Included in the Characterization of Baseline Conditions	44

Figure 4-5A:	Receptor and Existing Barrier Locations.....	49
Figure 4-5B:	Receptor and Existing Barrier Locations.....	50
Figure 4-5C:	Receptor and Existing Barrier Locations.....	51
Figure 4-6A:	Existing Socio Economic Conditions.....	52
Figure 4-6B:	Existing Socio Economic Conditions.....	53
Figure 4-6C:	Existing Socio Economic Conditions.....	54
Figure 4-6D:	Existing Socio Economic Conditions.....	55
Figure 4-7A:	Results of Stage 1 Archaeological Assessment.....	67
Figure 4-7B:	Results of Stage 1 Archaeological Assessment.....	68
Figure 5-1:	Summary of Annual NOx Emissions.....	83
Figure 5-2:	Summary of Annual CO Emissions.....	83
Figure 5-3:	Summary of Annual VOC Emissions.....	84
Figure 5-4:	Summary of Annual PM2.5 Emissions.....	84
Figure 5-5:	Summary of Annual CO ₂ e Emissions.....	85
Figure 5-6:	Anticipated Construction Vibration Level at Various Distances to Receptors by Vibration Source.....	87
Figure 5-7A:	Technically Feasible Noise Barriers for Diesel RER and Electric RER.....	93
Figure 5-7B:	Technically Feasible Noise Barriers for Diesel RER and Electric RER.....	94
Figure 5-7C:	Technically Feasible Noise Barriers for Diesel RER and Electric RER.....	95
Figure 5-7D:	Technically Feasible Noise Barriers for Diesel RER and Electric RER.....	96
Figure 5-7E:	Approximate Locations of Vibration Mitigation.....	97
Figure 5-7F:	Approximate Locations of Vibration Mitigation.....	98
Figure 5-7G:	Approximate Locations of Vibration Mitigation.....	99
Figure 5-8:	TTC Routes within the Study Area.....	106

List of Tables

Table 1-1:	GO Expansion Program Service Rail Traffic Data.....	2
Table 1-2:	Technical Report Assessment Areas.....	3
Table 1-3:	Summary of EPR Requirements.....	4
Table 3-1:	Design Zone Speeds and PSO.....	10
Table 4-1:	ESAs within the Study Area and the Natural Environment Assessment Area.....	20
Table 4-2:	Herpetofauna Records within the Natural Environment Assessment Area.....	24
Table 4-3:	Mammal Records within the Natural Environment Assessment Area.....	27
Table 4-4:	Results of Breeding Bird Surveys.....	29
Table 4-5:	SAR and SOCC Screening within the Natural Environment Assessment Area.....	32
Table 4-6:	Aquatic Species Records from the Don River within the Natural Environment Assessment Area.....	36
Table 4-7:	NHIC Rare Fish Species Records.....	37
Table 4-8:	Summary of MOECC Water Well Record Information.....	41
Table 4-9:	Summary of Air Quality Criteria.....	43
Table 4-10:	Summary of Suburban Baseline Air Quality Conditions.....	45
Table 4-11:	Existing Rail Service Traffic (Diesel).....	47
Table 4-12:	Existing Pedestrian Traffic Volumes and Patterns at Danforth GO Station.....	61
Table 4-13:	TTC Routes Crossing the Lakeshore East Rail Corridor within the Study Area.....	62
Table 4-14:	Known Archaeological Sites within the Study Area.....	65
Table 5-1:	Evaluation Factors and Related Criteria.....	69
Table 5-2:	ELC Vegetation Communities Affected by Vegetation Removal.....	71

Table 5-3:	Annual Emissions from Diesel Locomotives	82
Table 5-4:	Recommended Vibration Levels (from FTA)	86
Table 5-5:	Vibration Assessment Results for GO and Freight Trains	89
Table 5-6:	Service Frequency and Ridership for Potentially Impacted TTC Routes.....	107
Table 5-7:	CHER Summary	108
Table 7-1:	Review Agencies and Stakeholder Consultation.....	120
Table 7-2:	Consultation with Indigenous Communities	124
Table 7-3:	Summary of Outreach to Elected Officials and Community Organizations.....	126
Table 8-1:	Summary of Future Commitments and Monitoring Requirements	137

Appendices

Appendix A. Preferred Design Plates

Appendix B. Technical Reports

- B1. Natural Environment Effects Assessment Report
- B2a. Air Quality Baseline Conditions Report
- B2b. Air Quality Impact Assessment Report
- B3. Noise and Vibration Modelling Report
- B4. Socio-Economic and Land Use Effects Assessment Report
- B5. Traffic Impact Study Report
- B6a. Cultural Heritage Screening Report
- B6b. Cultural Heritage Evaluation Reports
- B7. Stage 1 Archaeological Assessment Report

Appendix C. Consultation Materials

- C1. Contact Lists
- C2. Notices
- C3. PM Summary Reports
- C4. Agency Letters (sent/received)
- C5. Agency Review Comment/Response Tables
- C6. TAC Meeting Minutes
- C7. Stakeholder Meeting Summaries
- C8. Communication Tracker and Email Copies
- C9. Indigenous Meeting Materials and Meeting Minutes
- C10. Elected Official Meeting Materials and Summaries

Glossary of Terms

AA	Archaeological Assessment
AAQC	Ambient Air Quality Criteria
ANSI	Area of Natural and Scientific Interest
ASDB	Archaeological Sites Database
BCI	Bats Conservation International
CAAQS	Canadian Ambient Air Quality Standards
CEAA	<i>Canadian Environmental Assessment Act</i>
CHER	Cultural Heritage Evaluation Report
CHSR	Cultural Heritage Screening Report
CNR	Canadian National Railway
COSSARO	Committee on the Status of Species at Risk in Ontario
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DBH	Diameter at Breast Height
DFO	Fisheries and Oceans Canada
DRM	Design Reference Manual
EA	Environmental Assessment
EASR	Environmental Activity and Sector Registry
EC	Environment Canada
ECA	Environmental Compliance Approval
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification
EPR	Environmental Project Report
ESA	Ontario's <i>Endangered Species Act</i> , 2007
FTA	Federal Transit Administration
GHG	Greenhouse Gases
GTA	Greater Toronto Area
GTHA	Greater Toronto and Hamilton Area
GTR	Grand Trunk Railway
ha	hectares
HCD	Heritage Conservation Districts
HIA	Heritage Impact Assessment
km	kilometres
lb	pounds
LRT	Light Rail Transit
LSE	Lakeshore East
m	metres
m ²	metres squared
MBCA	<i>Migratory Birds Convention Act</i>
MDRP	Metrolinx Design Review Panel
Minister	Minister of the Environment and Climate Change
MMAH	Ministry of Municipal Affairs and Housing
MNRF	Ministry of Natural Resources and Forestry
MOECC	Ministry of the Environment and Climate Change
MPH	miles per hour
MTCS	Ministry of Tourism, Culture and Sport.
MTO	Ministry of Transportation
NAPS	National Air Pollution Surveillance program
NPA	<i>Navigation Protection Act</i>
OBBA	Ontario Breeding Bird Atlas
O. Reg.	Ontario Regulation
OCS	The Overhead Catenary System (OCS)

Glossary of Terms

OWRA	<i>Ontario Water Resources Act</i>
PAH	polycyclic aromatic hydrocarbons
PM	Particulate Matter
PM	Public Meeting
PM _{2.5}	fine particulate matter
PTTW	Permit to Take Water
PSO	A slow order or Permanent Slow Order (PSO) is a local speed restriction on a rail line which is set below the tracks normal speed limit
PSW	Provincially Significant Wetland
RER	Regional Express Rail
ROW	Right-of-Way
RTP	Regional Transportation Plan
SAR	Species at Risk.
SARA	Federal <i>Species at Risk Act</i> .
SARO	Species at Risk in Ontario.
SOCC	Species of Conservation Concern
SWH	Significant Wildlife Habitat
TAC	Technical Advisory Committee
TNHS	Terrestrial Natural Heritage System
TPAP	Transit Project Assessment Process
TRCA	Toronto and Region Conservation Authority
TTC	Toronto Transit Commission
USRC	Union Station Rail Corridor
V/C Ratio	Volume to Capacity Ratio
WTFN	Williams Treaties First Nations
ZOI	Zone of Influence

1. Introduction

1.1 Project Overview

The Metrolinx Regional Transportation Plan (RTP), titled “The Big Move”, outlines the strategic development guide for future Metrolinx expansion. The RTP identifies the need for increased and improved transit service in the Greater Toronto Hamilton Area (GTHA) over a 25-year period. The RTP identifies priority transit initiatives to be implemented within the next 15 years to provide significant improvements to the GTHA transportation network.

Metrolinx is completing a Transit Project Assessment Process (TPAP) under *Ontario Regulation (O. Reg.) 231/08, Transit Projects and Metrolinx Undertakings* (Transit Projects Regulation). The Lakeshore East Rail Corridor Expansion (Don River to Scarborough GO) Project (referred to herein as the Project) involves the addition of a fourth railway track and associated bridge widenings and culvert modifications on the Lakeshore East Rail Corridor between the Don River (Mi. 332.5) and Scarborough GO Station (Mi. 324.97). The proposed works include:

- Addition of the fourth track between the Don River Bridge and the Scarborough GO Station;
- The expansion will occur on the south side of the existing rail tracks between the Don River Bridge and Gerrard Street East, shifting to the north side of the existing tracks between Pape Avenue and Scarborough GO Station;
- Widening of three bridges at Woodbine Avenue, Warden Avenue and Danforth Avenue;
- Modifying the structure underneath the Birchmount Road Bridge;
- Modifications at Danforth GO Station;
- Retaining walls;
- Noise and vibration mitigation measures; and,
- Three culvert modifications: east of Coxwell Avenue at Small’s Creek (Mi. 329.50), east of Kennedy Road (Mi. 325.74), and Scarborough Junction (Mi. 325.55).

Metrolinx is implementing the GO Expansion Program, which will enable faster and more frequent train service along the Lakeshore East Rail Corridor. This Plan includes the expansion and improvement of the Lakeshore East Rail Corridor between the Don River and Scarborough GO Station to enhance safety, on-time performance, and operational flexibility/reliability in support of expanded rail service.

The potential environmental effects of the Project have been assessed following the TPAP requirements, as prescribed in *O. Reg. 231/08* under the *Environmental Assessment Act*. As part of the TPAP, this Environmental Project Report (EPR) has been prepared for stakeholder, including public and Indigenous community review. The EPR identifies the effects associated with the Project presented herein and the property envelope within which the Project can feasibly be constructed. Further refinement of the Project elements (e.g., grade separations, culverts etc.) will be advanced during Detailed Design.

It is anticipated that construction will occur from 2018 through 2021 in co-ordination with the electrification of this segment of the Lakeshore East Rail Corridor. Electrification-related construction is anticipated to extend beyond 2021. Further details regarding electrification of the GO Rail Network are provided in **Section 3.2.5**.

It shall be noted that although the construction of the fourth track is expected to be completed by 2021, service increases will not occur until Electrification-related construction is complete. No significant increases in diesel-powered trains along this segment of the Lakeshore East Rail Corridor are expected.

1.2 Purpose of the Transit Project

The purpose of this Project is to ensure service reliability for the future expansion of the Lakeshore East Rail Corridor by constructing a fourth track between the Don River and Scarborough GO Station. The construction of the fourth track, and associated infrastructure (i.e., structural modifications to 4 bridges, Danforth GO Station modifications and construction of retaining walls, where required) is necessary to support the future 15-minute electrified service along this portion of the GO Transit network. Although the expected timeline for the completion of the Project is 2021, there are no anticipated significant increases in diesel-powered train service. The future 15-minute service will commence following the completion of the Electrification project and the implementation of electric trains. The completion of the Electrification TPAP is expected in Fall 2017 and the construction of the electrification project is expected to be completed in 2025. In the event that electrification of the corridor is not implemented, an addendum to this TPAP will be necessary prior to document changes.

The Lakeshore East Rail Corridor is the second busiest of GO Transit's seven (7) corridors within the GTHA. Every weekday, this rail corridor accommodates 88 GO Train trips, carrying a total of approximately 55,000 passengers. Building on the 30-minute off-peak service introduced in June 2013, Metrolinx is moving forward with the GO Expansion Program that will provide new travel choices on the GO Transit network across the GTHA, including a 15-minute future electrified service along the Lakeshore East Rail Corridor. **Table 1-1** provides the projected number of trips based on 15-minute future electrified service.

Table 1-1: GO Expansion Program Service Rail Traffic Data

Section	Train Type	Number of Trains ¹	
		Daytime ²	Nighttime ³
Don River to Danforth GO	Eastbound Regular GO Train (Revenue)	63	17
	Eastbound Express GO Train (Revenue)	6	0
	Eastbound GO Train (Non-Revenue)	23	6
	Eastbound VIA Trains (Revenue)	18	0
	Westbound Regular GO Train (Revenue)	62	15
	Westbound Express GO Train (Revenue)	8	1
	Westbound GO Train (Non-Revenue)	22	5
	Westbound VIA Trains (Revenue)	16	1
	Stouffville GO Trains (Revenue and Non-Revenue)	148	32
	CN Freight Switchers ⁴	2	0
Danforth GO to Scarborough GO	Eastbound Regular GO Train (Revenue)	63	17
	Eastbound Express GO Train (Revenue)	6	0
	Eastbound GO Train (Non-Revenue)	23	6
	Eastbound VIA Trains (Revenue)	18	0
	Westbound Regular GO Train (Revenue)	62	15
	Westbound Express GO Train (Revenue)	8	1
	Westbound GO Train (Non-Revenue)	22	5
	Westbound VIA Trains (Revenue)	16	1
	Stouffville GO Trains (Revenue and Non-Revenue)	148	23
	CN Freight Switchers ⁵	2	0

Notes: 1. The Total Number of Trains per Day was taken from Metrolinx in a spreadsheet called "Total Equipment Trips Operated" (October 29, 2015) and is also included in Appendix G of the Draft Electrification EPR.

2. Daytime is between 0700h and 2300h.

3. Nighttime is between 2300h and 0700h.

4. Freight train travelling eastbound on the Kingston Subdivision.

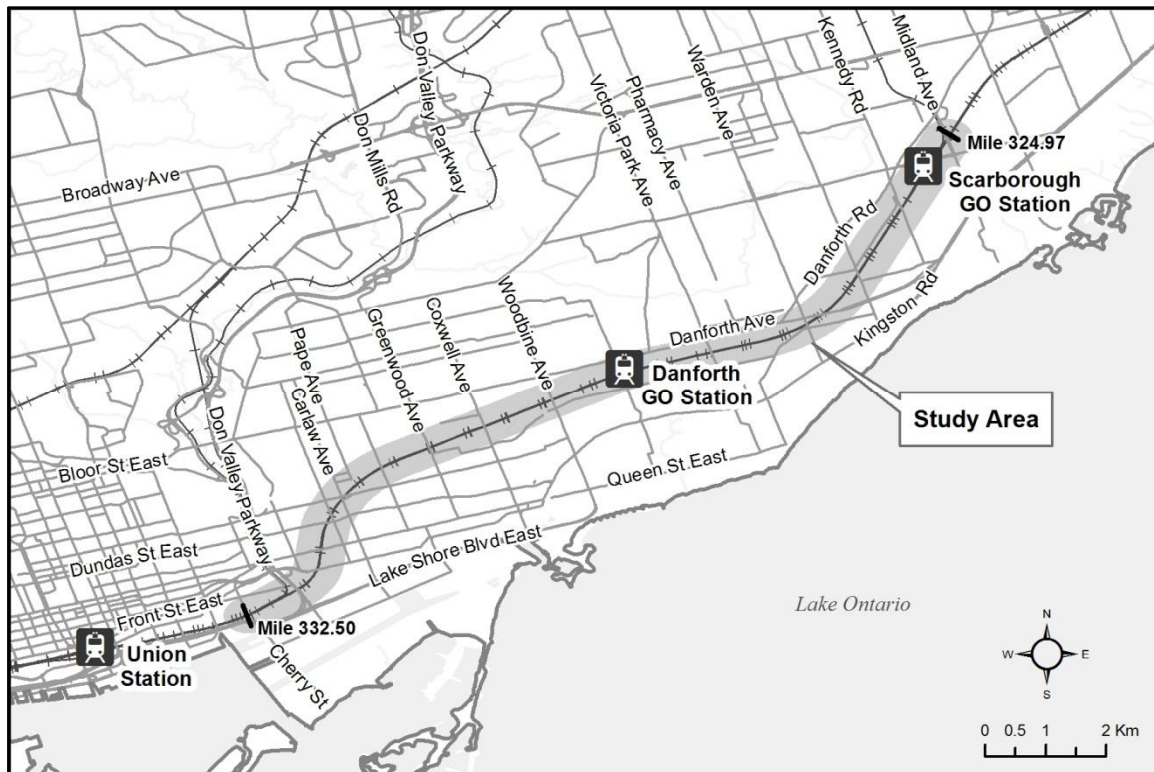
5. Freight train travelling southbound on the Uxbridge Subdivision.

1.3 Description of the Study Area

The Study Area boundaries of the 12 kilometre (km) Project, shown in Figure 1-1, are as follows:

- West boundary: north of the Don Yard, east of Cherry Street, west of the Don River (Mi. 332.50); and
- East boundary: Midland Avenue, east of Scarborough GO Station (Mi. 324.97).

Figure 1-1: Study Area



To complete the specific technical studies required for this TPAP, the Study Area includes a 300 m buffer beyond the existing rail corridor right-of-way (ROW) between the west and east boundary to account for environmental features that may be potentially affected by the proposed Project. Other specific Assessment Areas delineated for these technical studies are described in **Table 1-2**.

Table 1-2: Technical Report Assessment Areas

Technical Reports	Assessment Area
Natural Environment Existing Conditions and Environmental Effects Assessment Report	Terrestrial: Approximately 500 m on either side of the existing Lakeshore East Rail Corridor for desktop review and within the 300 m Study Area. Aquatic: 50 m upstream and 250 m downstream of each watercourse crossing. However, the downstream assess reach was shortened where safe land access was a factor.
Air Quality Assessment Report	30 m on either side of the existing Lakeshore East Rail Corridor.
Noise and Vibration Impact Assessment Report	300 m on either side of the existing Lakeshore East Rail Corridor
Socio-Economic and Land Use Impact Assessment Report	Study Area plus a 300 m buffer offset on either side of the existing Lakeshore East Rail Corridor.
Traffic Impact Study	Includes area bounded by Coxwell Avenue to the west, O'Connor Drive / St. Clair

Table 1-2: Technical Report Assessment Areas

Technical Reports	Assessment Area
	Avenue to the north, and Kingston Road to the south as well as to the east.
Cultural Heritage Screening Report	Lakeshore East Rail Corridor and adjacent properties.
Stage 1 Archaeological Assessment Report	Research information drawn from Ministry of Tourism, Culture and Sport (MTCS) Archaeological Sites Databased (ASDB) for a listing of registered archaeological sites within a 1 kilometre (km) radius, reports of previous archaeological assessment within 50 m.

1.4 Overview of Environmental Project Report (EPR)

Table 1-3 summarizes the information that is required in the EPR, as applicable to this Project and as specified in pages 33-34 of the *Guide to Ontario's TPAP* (Ministry of the Environment and Climate Change (MOECC), 2014), and the associated section of the EPR where it has been addressed.

Table 1-3: Summary of EPR Requirements

EPR Requirement	Section of EPR
A statement of the purpose of the transit project and a summary of any background information relating to the Project.	Section 1
A final description of the transit project including a description of the preferred design method.	Section 3
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 4
A description of all studies carried out, including a summary of all data collected or reviewed and a summary of all results and conclusions.	Sections 4 and 5
The assessments, evaluation and criteria for any impacts of the preferred design method and any other design methods that were considered once the project's transit project assessment process commenced.	Section 5
A description of any proposed measures for mitigating any negative impacts the transit project might have on the environment.	Section 5
If mitigation measures are proposed, a description of the proposal for monitoring or verifying the effectiveness of the mitigation measures.	Sections 5 and 8
A description of any municipal, provincial, federal, or other approvals or permits that may be required.	Sections 5 and 8
A consultation record.	Section 7

2. Study Process

2.1 Transit Project Assessment Process (TPAP)

This EPR was prepared in accordance with *O. Reg. 231/08, Transit Projects and Metrolinx Undertakings* (Transit Projects Regulation). By following the TPAP, the Transit Projects Regulation exempts the proponent of the transit project (i.e., Metrolinx) from the requirements under Part II of the *Environmental Assessment Act*.

The TPAP is based on the principles and best practices of EA planning. As such, it requires the proponent to make decisions based on sound approaches and methods, in consultation with stakeholders. The TPAP is a self-assessment process that allows proponents to build on past planning decisions. Although proponents are not required to consider alternatives to transit as part of the process, they must consider alternative designs and identify potential environmental impacts and mitigation measures when evaluating and recommending a plan.

The TPAP also requires proponents to complete the assessment within a six-month regulated time limit following the publication of a Notice of Commencement. This time frame includes an up to 120-day consultation and documentation period, a 30-day public review period, and a 35-day period in which the Minister of the Environment and Climate Change may review objections. To be eligible for action by the Minister, objections to the project must relate to a potential negative impact on a matter of provincial importance relating to the natural environment, cultural heritage values or interests, or a constitutionally protected Aboriginal or Treaty Right.

Metrolinx undertakes introductory activities and consultation through Pre-Planning Activities prior to the commencement of the TPAP. Following completion of the Pre-Planning Activities, the Notice of Commencement is issued. It is at this point that the regulated 120-day timeframe commences. For this project, Metrolinx issued a combined 'Notice of Commencement and Public Meeting #2' on May 18, 2017.

The prescribed steps of the TPAP are outlined in **Figure 2-1**.

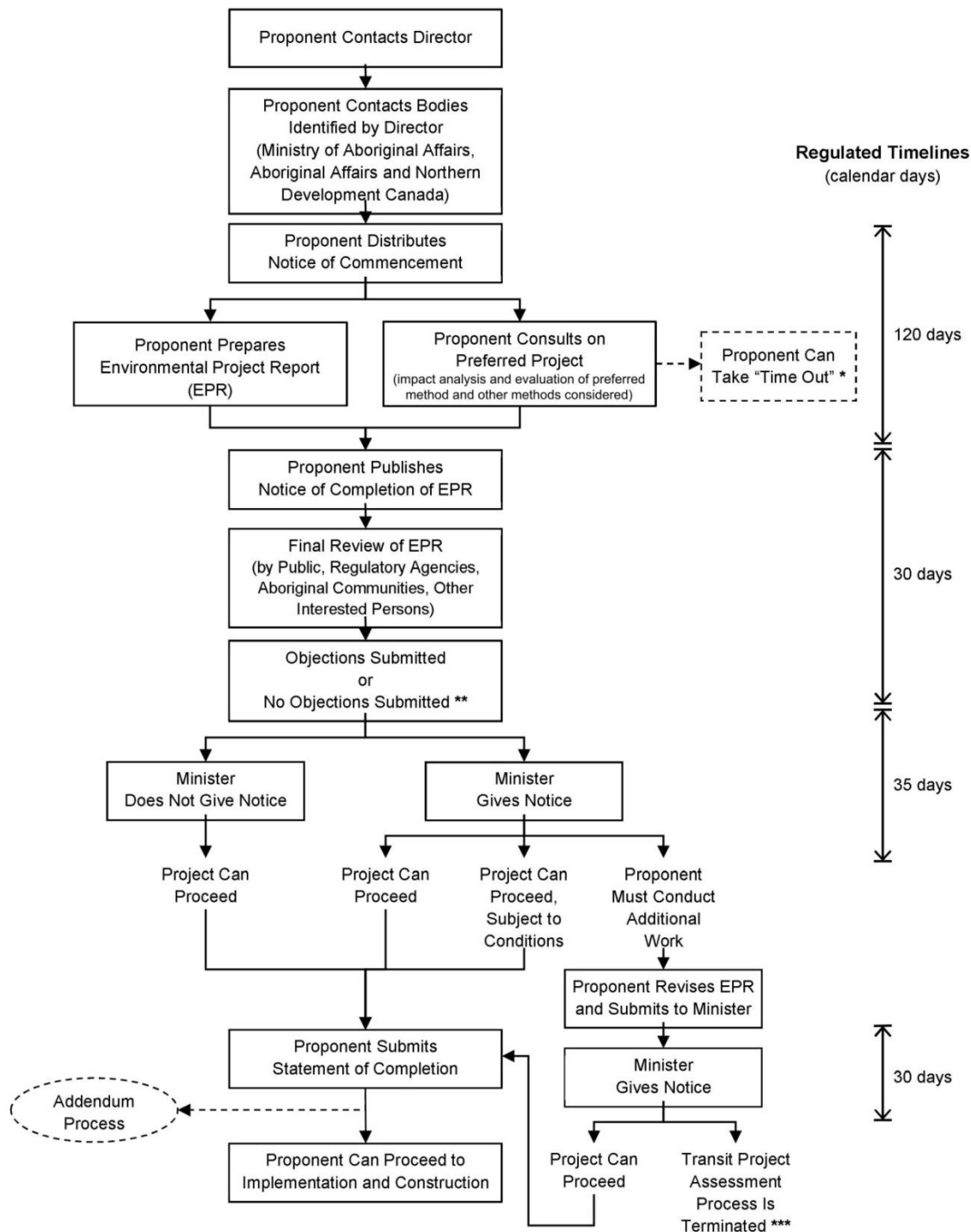
2.1.1 Pre-Planning Activities

The Pre-Planning Activities of this Project involved the following main activities prior to commencing the TPAP process.

2.1.1.1 Existing Environmental Conditions

The existing environmental conditions within the overall Study Area and within discipline-specific study areas were established as part of the pre-planning activities. Each of the primary environmental factors were assessed by practitioners using industry standard techniques. Studies were undertaken to document the existing environmental conditions in the following areas:

- Natural Environment;
- Soils and Groundwater;
- Air Quality;
- Noise and Vibration;
- Socio-Economic and Land Use;
- Traffic and Transportation;
- Utilities;
- Cultural Heritage; and,
- Archaeology.

Figure 2-1: Transit Project Assessment Process¹

¹ * Proponent can take a "time out" only when there is potential negative impact on a matter of provincial importance that relates to the natural environment or has cultural heritage value or interest or on a constitutionally protected Aboriginal or treaty right.

** Given the Minister's authority to act, concerns or objections should be on the basis that a proposed transit project may have a potential negative impact on a matter of provincial importance that relates to the natural environment or has a cultural heritage value or interest or on a constitutionally protected Aboriginal or treaty right.

*** Proponent must follow an approved class environmental assessment process (refer to Part II.1 of Ontario's Transit Project Assessment Process Guide) or the process under Part II of the Environmental Assessment Act.

2.1.1.2 Public and Stakeholder Consultation

Consultation for this Project occurred in two (2) main stages – prior to the Notice of Commencement for the TPAP (including the release of the draft Environmental Project Report for technical agency review); and following the Notice of Commencement of the TPAP. To build strong relationships and get a complete understanding of local issues in the surrounding communities, and to ensure communities stay engaged and informed, Metrolinx consulted with the public and a range of stakeholders prior to officially commencing the TPAP. A further description of the consultation program followed by Metrolinx during both stages is described in **Section 7**.

Pre-TPAP consultation activities were conducted to inform Indigenous communities and technical review agencies of the Project. This included, but was not limited to, meetings with representatives from the City of Toronto, Toronto and Region Conservation Authority (TRCA), MTCS, utility companies, local community groups, local businesses, Indigenous communities and elected officials.

Metrolinx has implemented a Stakeholder Engagement Strategy that includes web-based information, e-mail communications, proactive outreach to community groups, meetings with Indigenous communities and public meetings. Two (2) rounds of Public Meetings were held in locations in the City of Toronto: one (1) in November 2016 during Pre-Planning Activities; and one (1) during the TPAP in June 2017. Public meetings were promoted through the Project website (www.metrolinx.com/DonRiverScarborough), local newspaper advertisements, and mailings and/or e-mails to local residents, technical review agencies, identified stakeholder groups, and Indigenous communities. The Public Meetings and focused stakeholder specific meetings provide an opportunity to speak directly with the Project Team. In this manner, the stakeholders are be introduced to the Project and encouraged to provide comments on the assessment of existing environmental conditions and potential environmental effects within the Study Area.

2.1.2 Key Steps of the TPAP

Metrolinx issued the Notice of Commencement to begin the 120-day TPAP on May 18, 2017. The TPAP defines a series of activities that allows the process to be completed within approximately six (6) months. These activities involve the following steps:

- Contact with the MOECC to help identify Indigenous communities that may be interested in the Project;
- Issue Notice of Commencement of the TPAP;
- Environmental effects assessment and mitigation development and consultation with the public and stakeholders;
- Issue Notice of Completion of the EPR (within 120 days of the Notice of Commencement);
- Provide 30 days for the public, review agencies, Indigenous communities and other interested persons to review the EPR;
- Provide 35 days for the Minister of the Environment and Climate Change to review the EPR; and
- Proponent submits a Statement of Completion.

O. Reg. 231/08 provides a process by which the proponent may take a 'time out' during the 120-day TPAP consultation and documentation process. This may be used only when issues arise during the 120-day period concerning a potential negative impact on a matter of provincial importance that relates to the natural environment or has cultural or heritage value or interest, or a constitutionally protected Aboriginal or treaty right. If a time out is taken, then notice of this must be provided to the Director and Regional Director of the MOECC and posted on the Project website. Once the issue has been addressed, the proponent may resume the TPAP by notifying the Director and Regional Director of the MOECC.

2.1.3 Environmental Project Report

The documentation of the TPAP, as provided in this EPR, is submitted to MOECC and filed for public review within 120 days of publishing the Notice of Commencement. This EPR documents the existing environmental conditions within the Study Area, the potential environmental effects of the Project, recommended mitigation measures, the consultation process followed, and future commitments for the Project.

2.1.4 Objection Process, Minister's Review and Statement of Completion

The submission of this EPR and the issuance of the Notice of Completion triggers the 30-day public review period. During this time, if members of the public, regulatory agencies, Indigenous communities, or other interested persons have concerns about this transit Project, objections can be submitted to the MOECC. After the 30-day review period has ended, any objections received will not be considered, and the Minister has 35 days within which certain authority may be exercised.

Persons wishing to submit an objection for the Minister to consider should provide the following information:

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

Whether or not there is public objection, the Minister may act within the 35-day period to issue one of the following three notices to the proponent:

- Notice to Proceed with the transit project as planned in its EPR;
- Notice that requires the proponent to take further steps, which may include further study or consultation; or
- Notice allowing the proponent to proceed with the transit project subject to conditions.

The Minister may give notice allowing the proponent to proceed with the transit project; however, the Minister can only take action if there is potential for a negative impact on a matter of provincial importance that relates to the natural environment or has cultural heritage value or interest, or on a constitutionally protected Aboriginal or treaty right. If the Minister issues a notice to proceed with the transit project as planned, or if the Minister does not act within the 35-day period, Metrolinx will issue a Statement of Completion and proceed to implementation. The Statement of Completion will indicate that Metrolinx intends to proceed with the transit project in accordance with either:

- The EPR;
- The EPR subject to conditions set out by the Minister; or
- The Revised EPR.

The construction or implementation of a transit project subject to the TPAP cannot begin until the TPAP requirements have been satisfied.

3. Project Description

Metrolinx is completing a TPAP under *O. Reg. 231/08* to evaluate expanding and improving the Lakeshore East Rail Corridor between the Don River and Scarborough GO Station (Mi. 332.50 to Mi. 324.97) in the City of Toronto. The proposed works include:

- Addition of a fourth track between the Don River Bridge and the Scarborough GO Station;
- The expansion will occur on the south side of the existing rail tracks between the Don River Bridge and Gerrard Street East, shifting to the north side of the existing rail tracks between Pape Avenue and Scarborough GO Station;
- Widening of bridges at Woodbine Avenue, Warden Avenue and Danforth Avenue;
- Modifying the structure underneath the Birchmount Road Bridge;
- Modifications at Danforth GO Station;
- Retaining walls;
- Noise and vibration mitigation measures; and,
- Three culvert modifications: east of Coxwell Avenue and Small's Creek (Mi. 329.50), east of Kennedy Road (Mi. 325.74), and Scarborough Junction (Mi. 325.55).

The Preferred Design of the Project is provided in **Appendix A**. The main elements of the preferred design are detailed in this section.

3.1 Existing Rail Infrastructure

The existing Lakeshore East Rail Corridor runs in an east-west direction from the Union Station Rail Corridor (USRC) in the west to Oshawa GO Station in the east, along the Metrolinx Kingston and GO Subdivisions. The Study Area boundaries for this EA along the Lakeshore East Rail Corridor Expansion Don River to Scarborough GO Station are:

- West boundary: north of Don Yard, east of Cherry Street, west of Don River
- East boundary: Midland Avenue, east of Scarborough GO Station

This portion of the Lakeshore East Rail Corridor contains three (3) in-service mainline railway tracks and multiple non-mainline railway sidings. To accommodate additional capacity and achieve service improvements, Metrolinx intends to add one new mainline track in this section for a total of four tracks to allow for future expansion of the rail service.

Within the Study Area, the Lakeshore East Rail Corridor intersects with a number of municipal roads in the City of Toronto. All the road crossings within the Study Area are already grade-separated and are as follows:

- | | | |
|-----------------------|------------------------|------------------------------|
| ▪ Don Valley Parkway | ▪ Jones Avenue | ▪ Warden Avenue |
| ▪ Eastern Avenue | ▪ Greenwood Avenue | ▪ Danforth Avenue |
| ▪ Queen Street East | ▪ Coxwell Avenue | ▪ Birchmount Road |
| ▪ Dundas Street East | ▪ Woodbine Avenue | ▪ Kennedy Road |
| ▪ Logan Avenue | ▪ Main Street | ▪ St. Clair Avenue East, and |
| ▪ Carlaw Avenue | ▪ Victoria Park Avenue | ▪ Midland Avenue |
| ▪ Gerrard Street East | | |

Existing and proposed rail infrastructure within the Study Area is shown in **Figures 3-1A** and **3-1B**.

Additionally, the Lakeshore East Rail Corridor crosses a total of two watercourses within the Study Area, the Don River and Small's Creek, as also shown **Figures 3-1A** and **3-1B**. The GO Don River Bridge, built in 1926, is located at Mi. 332.5 and currently carries five railway tracks. The Don River Bridge, currently in active use, does not require modification work as part of this Project.

Four (4) of the existing grade separated structures bridges (Woodbine Avenue, Warden Avenue, Danforth Avenue, and Birchmount Road) will need structural modification to accommodate the new fourth track. Each of these bridges is described in more detail in **Section 3.5**.

The Danforth GO Station and Scarborough GO Station are also located within the Study Area and provide commuters with access to rail services to downtown Toronto, Oshawa GO Station, and Stouffville GO Station in the Regional Municipality of York.

Additional GO/SmartTrack stations are proposed within the Study Area and will be subject to separate assessment under the TPAP.

3.2 Key Design Criteria

A number of key design criteria were assumed in developing the preferred design, in consultation with the Metrolinx Design Reference Manual (DRM) and relevant City of Toronto road design standards.

3.2.1 Track Spacing and Clearances

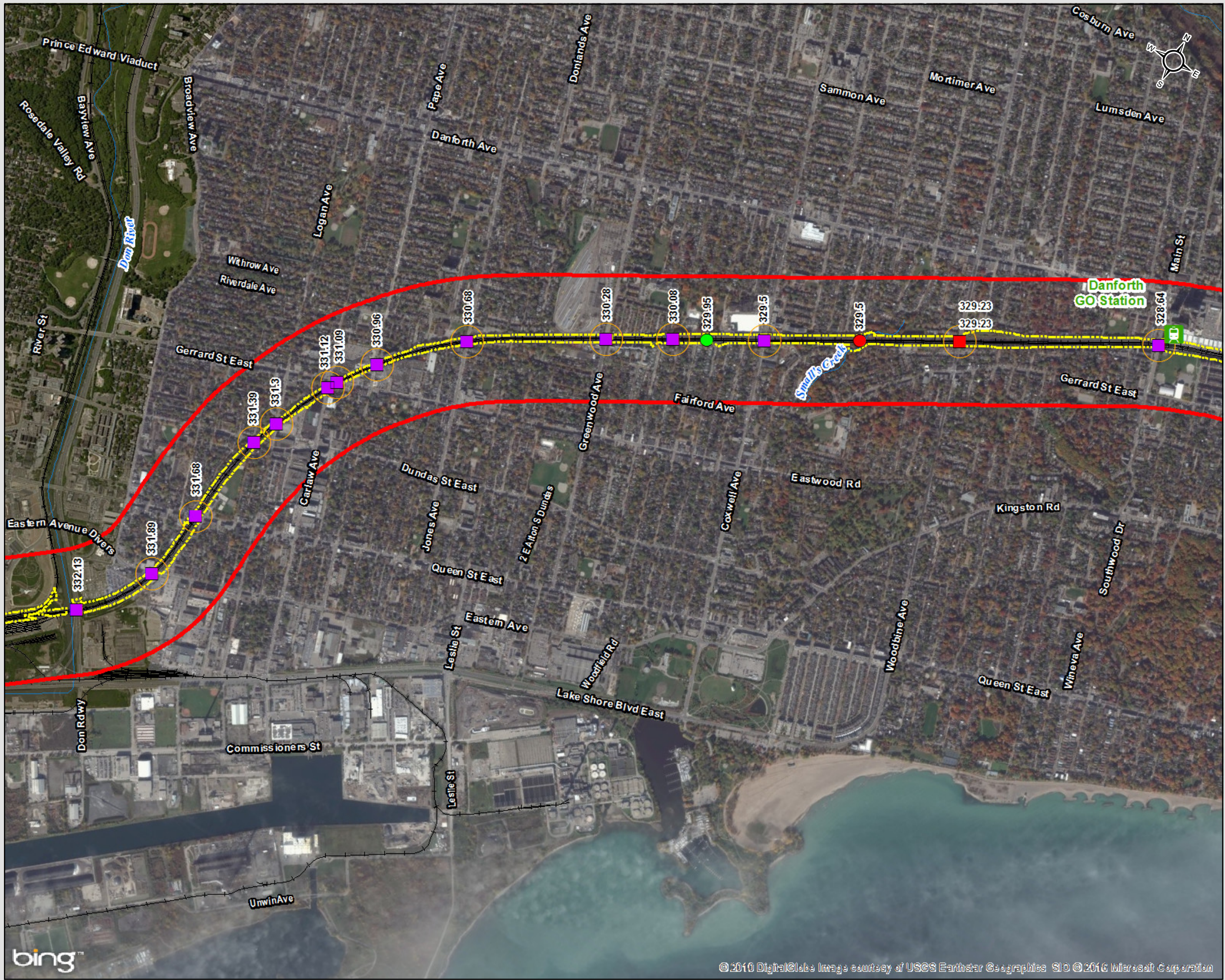
Track spacing between the new fourth track and the existing mainline tracks will be offset by a minimum of 13 ft. (3.96 m). In general, the new fourth track alignment is designed to match the existing mainline track vertical profile to provide a constant horizontal offset. At GO Stations which contain island platforms, track centres will be at 35 ft. (10.67 m). The clearance envelope for all structures over or beside the new tracks will be set as per the Metrolinx DRM. For bridge widenings the existing road clearances will be maintained.

3.2.2 Design Speed

The design of the fourth track will be developed to optimize and improve on existing zone speeds for the Don River to Scarborough GO Station of the Lakeshore East Rail Corridor. However, there are multiple Permanent Slow Orders (PSO) along the corridor where local speed restrictions apply below the Lakeshore East Rail Corridor's design speed limit as shown in **Table 3-1**. Track speed for the fourth track will be designed to improve existing conditions and maximize GO service efficiency.

Table 3-1: Design Zone Speeds and PSO

Approximate Location	Mileage	Passenger (MPH)	Freight (MPH)
Zone Speeds			
USRC	332.40	90 (145 km/h)	60 (97 km/h)
PSO			
Birchmount Road – west of Main Street	326.50 – 328.80	80 (129 km/h)	60 (97 km/h)
West of Greenwood Avenue – Logan Avenue	330.40 – 331.30	80 (129 km/h)	60 (97 km/h)
Logan Avenue – east of USRC	331.30 – 332.25	60 (97 km/h)	60 (97 km/h)



- Legend**
- Existing Bridge
 - Proposed Bridge Widening
 - Existing Culvert
 - Proposed Culvert Modification
 - Existing Grade Separation
 - Study Area (300m Buffer)
 - Lakeshore East Rail Corridor
 - GO Stations
 - Watercourse
 - Waterbody
 - Ontario Railway Network

0 175 350 700
m
1:18,000
MTM 3Degree, NAD 27

Contains information licensed under the Open Government Licence – Toronto, and Open Government Licence – Canadas. Bing Maps Aerial - © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2014 Microsoft Corporation
This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Metrolinx Lakeshore East Rail Corridor Expansion
(Don River to Scarborough Go Station) Project
Environmental Project Report

**Existing and Proposed
Rail Infrastructure
within the Study Area**

April 2017

AECOM

Figure 3-1A



- Legend**
- Existing Bridge
 - Proposed Bridge Widening
 - Existing Culvert
 - Proposed Culvert Modification
 - Existing Grade Separation
 - Study Area (300m Buffer)
 - Lakeshore East Rail Corridor
 - GO Stations
 - Watercourse
 - Waterbody
 - Ontario Railway Network

0 175 350 700
m
1:18,000
MTM 3Degree, NAD 27

Contains information licensed under the Open Government Licence – Toronto, and Open Government Licence – Canadas. Bing Maps Aerial - © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2014 Microsoft Corporation This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Metrolinx Lakeshore East Rail Corridor Expansion (Don River to Scarborough Go Station) Project Environmental Project Report

Existing and Proposed Rail Infrastructure within the Study Area

April 2017

AECOM

Figure 3-1B

Map Document: P:\0315654\400-Technical\02-Environmental Assessment (TPAP)\GIS\IMXD\0315654_KeyInfrastructure_Seg1_EPR.mxd
2016-10-28 11:01:57 AM

© 2010 DigitalGlobe Image courtesy of USGS Earthstar Geographics SIO © 2016 Microsoft Corporation

3.2.3 Construction Laydown and Staging Areas

Separate construction laydown and staging areas will be required at various locations along the rail corridor. These locations will be confirmed during Detailed Design and will be subject to further environmental due diligence, as required.

3.2.4 Trackwork

The rail used for the Project will be 136 pounds (lb) continuous welded rail for both mainline and special trackwork. Mainline track will be constructed on concrete ties, while crossings and track switches will be constructed on wood ties.

3.2.5 Retaining Walls and Grading

Grading for the new fourth track will be designed with the intent to minimize additional land acquisition requirements and reduce footprint impacts as warranted and feasible. In some cases retaining walls are proposed within the Lakeshore East Rail Corridor to reduce impacts to notable treed areas. In general, a standard 2:1 side slope will be provided with a 1 m flat bottom ditch (in cut sections). Where the standard grading impacts the property line, a reinforced side slope of 1:1.5 may be provided to reduce the amount of land required to tie back to the original ground surface without impacting the property line.

During Detailed Design, property requirements will be further investigated. Where expanding the corridor grade is not feasible, retaining walls will be constructed. Currently proposed new retaining walls are shown on the design plates in **Appendix A**. The design of significant public facing retaining walls and corridor facing retaining walls that may be notable from a public realm perspective will be reviewed by the Metrolinx Design Review Panel (MDRP).

3.2.6 Electrification Accommodations

Electrification of the Lakeshore East Rail Corridor (among other Metrolinx corridors) is being addressed in a separate GO Rail Network Electrification TPAP.

The track and grading design accommodates the proposed Overhead Catenary System (OCS) pole layout locations, in addition to other electrification requirements, for future electrification of the Lakeshore East Rail Corridor.

To accommodate the electrification of the tracks and also provide space for the final locations of the longitudinally running utilities (CN Fibre Optic/GO Signals), a ductbank may be installed along the corridor.

Construction is anticipated to occur from 2018 through 2022 in co-ordination with the Electrification of this segment of the Lakeshore East rail corridor. Electrification-related construction is anticipated to extend beyond 2022.

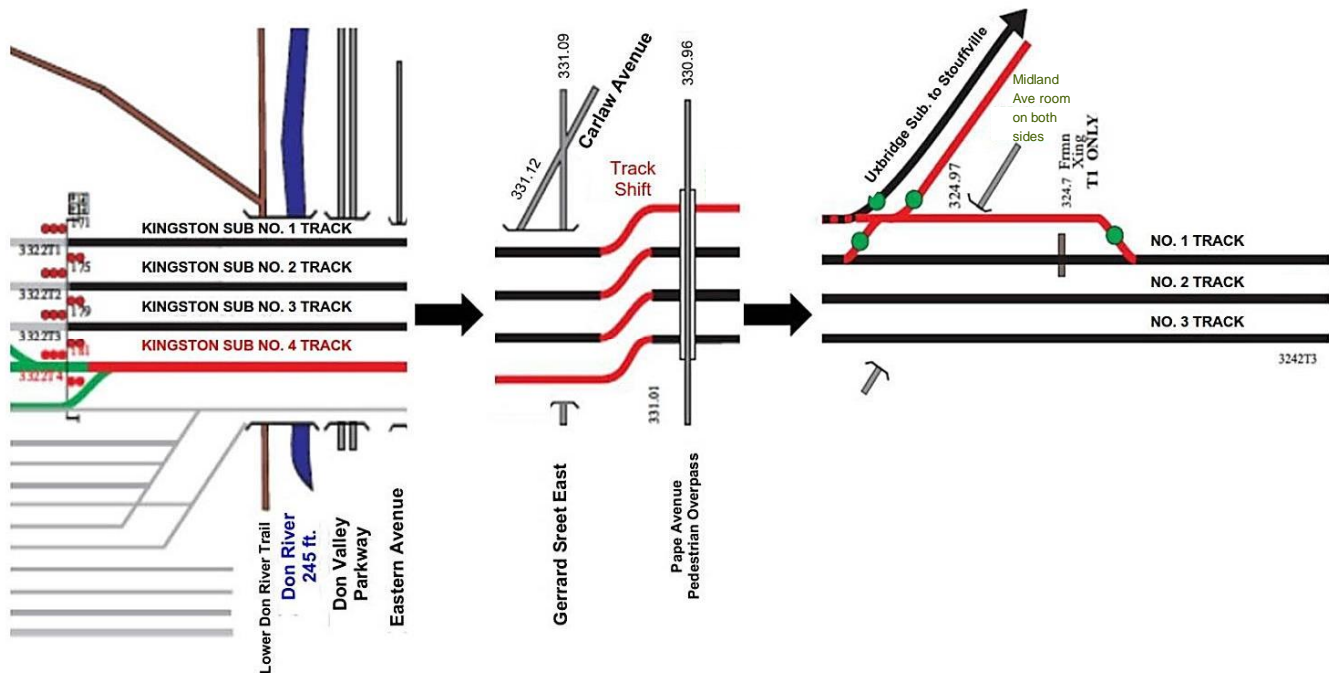
3.3 Preferred Track Alignment

The preferred track alignment takes into account the existing track configuration, the future rail service operations and speeds required, the topography and existing bridge structures within the existing Lakeshore East Rail Corridor, and a desire to minimize potential impacts to adjacent property to accommodate the additional fourth track.

3.3.1 Description of the Preferred Alignment

The description of the alignment travels east to west. The label of “Track 1” represents the track on the northernmost side to “Track 4” on the southernmost side of the corridor. An example of a simplified track shift is provided in **Figure 3-2**.

Figure 3-2: Simplified Track Shift Diagram



The new track ties into the existing fourth track to the west of Scarborough GO Station. A new crossover is proposed west of Kennedy Road between Track 1 and Track 2. The track continues on the north side below the Woodrow Avenue pedestrian bridge and below the modified structure at Birchmount Road. Refinements to track alignments (within the footprint of the Study Area) will occur during Detailed Design, along with any associated technical studies to assess potential impacts, where required.

The new track maintains a wider offset to the existing Track 2 as it travels across the existing grade separation structures at Danforth Avenue and Warden Avenue. To the west of Warden Avenue, the track spacing narrows down from the existing Track 2 prior to extending over the existing grade separation at Victoria Park Avenue.

The fourth track contains track separation from the existing Track 2 through Danforth GO Station. The Danforth GO Station future platforms will consist of two (2) islands. The platforms will also be relocated approximately 170 m east to allow the track not to impact the existing Main Street overpass.

Travelling west additional crossovers between Track 1 and Track 2 are required within the existing interlocking west of Main Street. The existing rail over road bridge structure at Woodbine Avenue will be widened to accommodate the new fourth track. The track maintains track geometry and travels over existing grade separation structures including Coxwell Avenue, Woodfield Road pedestrian tunnel, Greenwood Avenue and Jones Avenue. No structural modifications are needed at these locations.

The track expansion will shift from the north to the southwest of Jones Avenue. Moving west, the fourth track travels along the south side of the corridor until it ties into the USRC. The fourth track is able to fit along the existing

grade separation structures beneath Pape Avenue pedestrian overpass and above Gerrard Street East, Carlaw Avenue, Logan Avenue, Dundas Street East and Queen Street East.

West of Queen Street East, a No. 12 track switch will be relocated to extend to the service track along the south side of the corridor. Travelling west, all tracks travel over the Eastern Avenue grade separation towards the Don River Bridge where all tracks tie into the USRC.

The preferred track alignment is presented in **Appendix A**.

The potential environmental effects associated with the preferred track alignment and associated works are discussed in **Section 5** of this EPR.

3.4 Existing Grade Separation Structures

Grade separations serve to separate cars, pedestrians and cyclists from train traffic, improving travel speed and capacity of the roadway, minimizing delays and reducing the risk of collisions. This is of primary importance for roads that accommodate high traffic volumes and speeds.

No new grade separations are proposed to accommodate the fourth track expansion, as all roads are already grade separated. The fourth track construction will occur along many existing grade separation structure within the Study Area.

In addition to the rail over road structures, road over rail structures must accommodate the new fourth track. The fourth track alignment provides a constant offset to the mainline track; however, the location beneath road overpasses must accommodate bridge piers and other permanent structures.

3.5 Bridges

The following bridge structures will be widened or modified on the north side to accommodate the fourth track:

- Birchmount Road (Mi. 326.50) between the north pier and north abutment;
- Danforth Avenue (Mi. 327.01);
- Warden Avenue (Mi. 327.16); and,
- Woodbine Avenue (Mi. 329.23).

Murals under existing bridges may be impacted to some extent during construction. Mural reinstatement/extension will be co-ordinate with City staff and/or the local Councillor and community as appropriate.

Based on the preliminary design, functional impacts are anticipated to the City road rights-of-way. These functional impacts are only anticipated to be temporary through the staging of the construction, which will be determined through Detailed Design and reviewed with the City.

3.5.1 Birchmount Road Bridge

The Birchmount Road Bridge was built in 1957 which carries vehicular traffic over the Metrolinx Lakeshore East Rail Corridor. The structure was designed as a continuous three (3) span reinforced concrete structure, supported on intermediate concrete piers and concrete abutments. Its total span is 165 feet and an overall width of 62 feet. The structure appears to have been built as designed. The structure has functioned continuously as an overpass

structure since its construction in 1957. Details related to the heritage value of this bridge are presented in **Table 5-7**.

3.5.2 Danforth Avenue Bridge

The Danforth Avenue structure, built in 1923, consists of concrete abutments and a riveted steel plate girder structure that forms a two span crossing over Danforth Avenue, approximately 200 m east of Warden Avenue. The structure carries two (2) rail lines over Danforth, while a separate, newer span added in 2006 carries an additional third track over Danforth Avenue immediately east of the structure. Details related to the heritage of this bridge are presented in **Table 5-7**.

3.5.3 Warden Avenue Bridge

The Warden Avenue Bridge was constructed in 1951 after acquiring the Grand Trunk Railway (GTR). The bridge currently functions as a railway bridge. A mural was completed in 2013 on road facing components of the bridge, celebrating the history of Scarborough and the two neighbourhoods joined by the underpass (Oakridge and Birch Cliff).

3.5.4 Woodbine Avenue Bridge

The Woodbine Avenue Bridge was constructed in 1954 by CNR shortly after acquiring the GTR. The bridge functions as a railway bridge, with recent repairs completed in 2001. There is a mural on road facing components of the bridge called the 'THE RADICAL ENCOMPASS Project' that represents the entrance way into the surrounding communities.

3.6 Culverts

There are numerous existing culvert crossings along the Lakeshore East Rail Corridor. Due to the fourth track expansion, some of these culverts will need to be modified to accommodate the extra width and grading of the track.

Three (3) culverts are proposed to be modified. These culverts are as follows:

- Scarborough Junction (Mile 325.55);
- East of Kennedy Road (Mile 325.74); and
- East of Coxwell (Mile 329.50 – Small's Creek).

Further detailed reviews of these culverts will be conducted during Detailed Design. This will determine the type and extent of modifications required. The associated details will be reviewed with the City of Toronto and appropriate agencies during Detailed Design. The need for in- or near-water works will be determined during Detailed Design. Based on Preliminary Design, it is anticipated that in- or near-water works may be required at Small's Creek. Stormwater management will also be reviewed and addressed during Detailed Design.

A map showing all the existing culverts within the Study Area, including culverts that require modification is provided in **Figures 3-1A and 3-1B**.

3.7 Stations

Danforth GO Station and Scarborough GO Station are the existing stations within the Study Area (see **Figures 3-1A** and **3-1B**). No modifications at Scarborough GO Station will be required to accommodate the fourth track. However, the connection to the Stouffville Rail Corridor to the east of the station is under development by Metrolinx and will be co-ordinated with the design of the Lakeshore East Rail Corridor at a future stage.

Modifications to the Danforth GO Station will be required to accommodate the new fourth track. This will occur during Detailed Design, and will include any associated technical studies to assess potential impacts, where required. The modifications are not anticipated to extend beyond the Study Area.

Additional stations are proposed within the Study Area and will be subject to separate assessment under the TPAP.

A map showing the GO Stations within or adjacent to the Study Area is provided in **Figures 3-1A** and **3-1B**.

The City of Toronto is undertaking the Danforth Avenue Planning Study, which examines pedestrian connectivity adjacent to the rail corridor between Main Street and Victoria Park Avenue, including Danforth GO Station. This Study aims to ensure appropriate, safe and easy pedestrian connections between Main Street subway station, Danforth Avenue, and the future Danforth GO Station. In co-ordination with City Planning, Metrolinx is addressing potential links through the Danforth GO Station Connectivity Study, separately from this study.

3.8 Utilities

Numerous utilities such as Bell, CN Fibre Optic, Signals, power, and gas utilities are located within the Lakeshore East Rail Corridor. The utilities run in a variety of directions. In general, there are two (2) configurations of utilities which shall be dealt with separately. The utilities which run perpendicular to the tracks (i.e., cross the tracks) will be protected for any works being done across the utilities with the construction of the fourth track and grading. Co-ordination will be required with each individual utility during Detailed Design and proper crossing agreements must be reached with each utility.

Utilities which run longitudinally along the track will need to also be protected. During Detailed Design, co-ordination with these utilities will occur in order to remove, or temporarily relocate any utilities which may be impacted by the new fourth track grading.

3.9 Property Impacts

The ultimate intent of the Preliminary Design of the fourth track expansion along Lakeshore East Rail Corridor is to minimize property impacts and reduce the property acquisition requirements by utilizing engineering solutions to retain the track structure caused by expansion of the track corridor. Areas where engineering solutions were not possible include:

- At the east-end tie-in where the grade is significantly higher than the adjacent lands to the south side of the corridor. Approximately 942 metres squared (m^2) of additional property will be required in this location in addition to structural retaining walls.
- Six (6) properties along the north side of the corridor between the Danforth Avenue and Warden Avenue grade separation structures require additional property to be acquired. This is a result of the fourth track centreline impacting the property line. Therefore, a design including a ditch has been provided in this area with the additional property requirements marked out in the drawings.

- A 421 m² area east of Victoria Park Avenue will be required. This is due to the sudden decrease in available land (i.e., the property line shifting closer to the tracks). At this location, the property line lines up more-or-less with the extents of the sub-ballast.
- To accommodate the service track (lead into yard) to the east of the Don Valley Parkway Bridge, approximately 410 m² of property is required.

The potential environmental effects associated with the preferred track alignment and associated works are discussed in **Section 5** of this EPR.

4. Existing Conditions

This section of the EPR describes the natural, socio-economic, and cultural environments present within the Study Area in the context of the Lakeshore East Rail Corridor and provides the existing conditions against which the effects of the Project have been measured. The purpose of characterizing the existing environmental conditions is to establish a baseline condition to use for the assessment of potential effects and proposed mitigation measures in **Section 5**.

Information on the following components is presented in the sections below and is supplemented with detailed technical reports provided in **Appendix B**:

- Natural Environment;
- Soils and Groundwater;
- Air Quality;
- Noise and Vibration;
- Socio-Economic and Land Use;
- Traffic and Transportation;
- Utilities;
- Cultural Heritage; and,
- Archaeology.

Desktop analyses and field investigations were completed to characterize the existing conditions within the Study Area for each of the above components.

4.1 Natural Environment

For the purpose of the background information review, terrestrial and aquatic features and functions were identified within approximately 300 m of the Lakeshore East Rail Corridor between the Don River and Scarborough GO Station. An additional 500 m buffer described as the Natural Environment Assessment Area; surrounding the 300 m Study Area was investigated via desktop review to identify any additional natural features of interest. Terrestrial ecology field investigations focused on ground-truthing natural heritage resources within and overlapping the Lakeshore East Rail Corridor up to 120 m from the right-of-way, as such resources could potentially be impacted by the proposed Project. Aquatic ecology conducted in-field surveys at watercourse crossings.

The following sections summarize the key natural environment features identified through these desktop and field investigations. Refer to **Appendix B1** for a more detailed Natural Environment Effects Assessment.

4.1.1 Methods

Natural heritage features were identified based on information obtained from a variety of sources, including the Ministry of Natural Resources and Forestry (MNRF) online databases, mapping data, and correspondence, municipalities, TRCA correspondence and data provided, wildlife atlases, and other relevant background documents. Refer to **Appendix B1** for a comprehensive list of sources.

Multiple field investigations were completed within the appropriate season in 2016 to assess the various components of the terrestrial and aquatic ecosystems, as identified through the background review that may potentially be affected by the Project. These included the following surveys:

- Ecological land classification (ELC) surveys;
- Vascular plant surveys;
- Amphibian night surveys;
- Breeding bird surveys;
- Wildlife habitat assessments; and
- Aquatic features assessments.

4.1.2 Designated Features

The following sections document the key terrestrial features within the Natural Environment Assessment Area identified through desktop and field investigations.

4.1.2.1 Provincially and Locally Significant Wetlands

A review of mapping data and aerial photography for Provincially and Locally Significant Wetlands did not result in any findings within the Study Area or the Natural Environment Assessment Area. E-mail correspondence with MNRF Management Biologist, Margaret Bérubé, dated January 26, 2016, confirmed the absence of Provincially Significant Wetlands (PSW). There is, however, one unevaluated wetland within the Natural Environment Assessment Area located north of Gerrard Street East between Warden Avenue and Victoria Park Avenue, though it is located approximately 140 m from the Lakeshore East Rail Corridor and 174 m from the proposed track which falls outside of the immediate vicinity of the existing Lakeshore East Rail Corridor that could potentially be affected by the Project; as such no effects are anticipated and no further assessment is required.

4.1.2.2 Areas of Natural and Scientific Interest

A search was conducted using the *MNRF Make-a-Map: Natural Heritage Areas Application* (MNRF 2014a) and did not yield any Life Science nor Earth Science Areas of Natural and Scientific Interest (ANSIs) within the Study Area or the Natural Environment Assessment Area. Correspondence with MNRF Aurora District Office, dated January 26, 2016 confirmed these results. As such, no Project effects are anticipated and no further assessment is required.

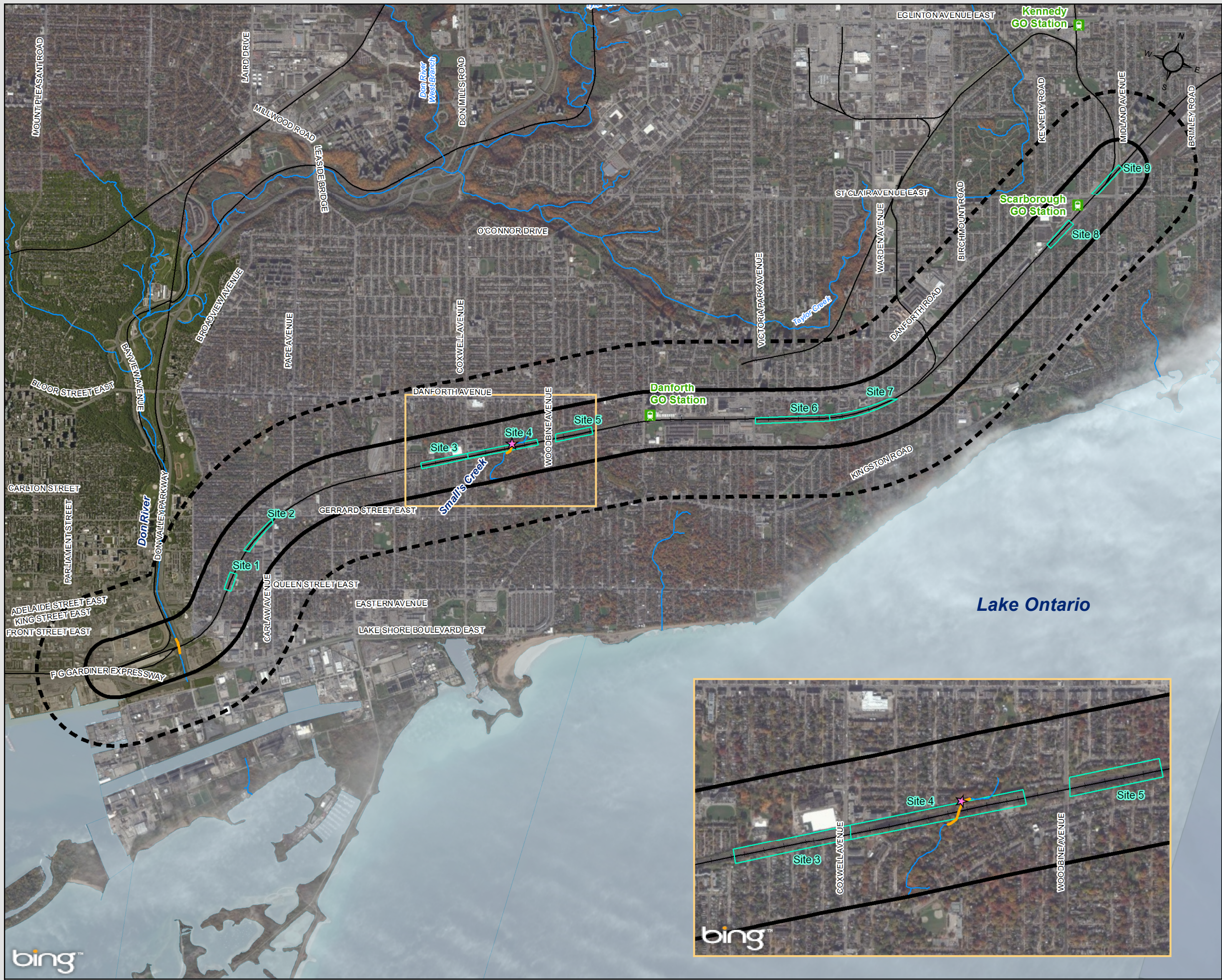
4.1.2.3 Environmentally Significant Areas

The Environmentally Significant Areas (ESAs) in the City of Toronto document (North-South Environmental Inc. et al., 2012) describes the presence of ESAs within the City. Using this reference document, ESAs occurring within the Natural Environment Assessment Area are summarized in **Table 4-1**. These areas are designated by the City of Toronto and represent the most locally and regionally significant terrestrial natural areas that form parts of the City's Natural Heritage System. The locations of these ESAs are provided in **Figure 4-1**.

Table 4-1: ESAs within the Study Area and the Natural Environment Assessment Area

ESA Name	ESA Description (where available)
Williamson Park	This ESA is 3.0 hectares (ha) in size and is located in the Waterfront valley system. It consists of deciduous upland, lowland and bottomland forests. The site has substantial seepage which supports wetland communities. There are two significant flora species and one significant fauna species found at this site, and it does not represent a significant stopover site for migrant songbirds.
North Shore Park	This ESA is 3.5 ha in size and is located in the Waterfront valley system. It consists of successional communities of mostly open meadows with small marsh areas and is home to four significant flora species.
Glen Davis Ravine	This 1.7 ha ESA located in the Waterfront Valley system consists of a forested, south-facing slope of a ravine with two significant flora species.
Warden Woods	This 34 ha ESA is part of the Don Valley system. It consists of a steep valley with a variety of habitats ranging from well-developed old field systems to red oak forested slopes. Seepage slopes are dominated by wetland plant species, including 16 significant flora species and is home to three significant vegetation communities. The marsh and swamp which are within this ESA provide 2.3 ha of water storage.

Map Document: P:\0315854\400- Technical\402 Environmental\Assessment (TPAP)\GIS\MXD\Wildlife Survey Locations 20160920.mxd
10/14/2016 9:27:59 PM



- Legend**
- Study Area
 - Assessment Area (500 m buffer)
 - Nocturnal Amphibian Calling Survey Station
 - Aquatic Habitat Assessment
 - 2016 Breeding Bird Survey Sites
 - Watercourse
 - GO Stations
 - Railway
 - Waterbody

0 250 500 1,000 1,500 2,000 2,500
1:39,000
NAD 83 Zone 17N

Contains information licensed under the Open Government Licence – Toronto, and Open Government Licence – Canadas. © 2010 DigitalGlobe Image courtesy of USGS Earthstar Geographics SIO © 2016 Microsoft Corporation This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Lakeshore East Rail Corridor Expansion
(Don River to Scarborough GO Station) Project
Environmental Project Report

Terrestrial Natural Heritage Features

September 2016

AECOM

Figure 4-1

With the exception of the Williamson Park ESA, all ESAs fall outside of the Study Area and are not expected to be affected by this Project. The Williamson Park ESA bisects the Lakeshore East Rail Corridor, falling within the immediate vicinity of the construction footprint. Typically, any development in, or within 120 m of, the boundaries of an ESA trigger the requirement for an Environmental Impact Study (EIS); in this case, Metrolinx is not subject to City of Toronto requirements though that requirement is met through submission of this EPR and the Natural Environment Effects Assessment (**Appendix B1**) to the City of Toronto for review and comment.

4.1.2.4 Conservation Authority Regulated Areas

The Study Area is located within the overall jurisdiction of TRCA. Under Section 28 of the *Conservation Authorities Act* (1998), Regulated Areas are established where development could be subject to flooding, erosion or dynamic beaches, or where interference with wetlands and alterations to shorelines and watercourses might have an adverse effect on those environmental features. There are two (2) TRCA Regulated Areas within the Study Area, associated with the Don River and Small's Creek, identified by the TRCA that may be affected by the Project. The TRCA will be consulted (as well as City of Toronto) to confirm the boundaries of these areas and wetlands at the Detailed Design phase of the Project.

As a provincial Crown corporation, Metrolinx will follow the Voluntary Project Review process as per the *Proponents and Projects Exempt from the TRCA Regulatory Approval Process* and request that TRCA reviews and comments on Detailed Design activities associated with Project construction, maintenance or emergency activities. Proponents are responsible for obtaining appropriate approvals independent of TRCA under the *Fisheries Act*, though the proponent can voluntarily seek confirmation from TRCA as to whether the proposed project includes appropriate *measures to avoid causing harm to fish and fish habitat* as per the Fisheries and Oceans Canada (DFO) Self-Assessment process requirements. Once TRCA concerns are satisfied, a Voluntary Project Review Letter is provided by TRCA staff.

4.1.2.5 Terrestrial Natural Heritage Target System – Toronto and Region Conservation Authority

The TRCA provided their mapping data for the limits of natural cover and their Terrestrial Natural Heritage System (TNHS) which contains the target system. This system was developed by the TRCA to identify natural features and areas that need to be protected and expanded within their jurisdiction in order to protect ecological functions and biodiversity (TRCA, 2007). Valley and stream corridors, wetlands, woodlands and meadows are key components of this target system. The TRCA also sets targets for improving the quality, integrity, quantity and connectivity of terrestrial natural features within the system (TRCA, 2007). Portions of the Study Area, including the Lakeshore East Rail Corridor, fall within the target system.

4.1.2.6 City of Toronto Official Plan – Natural Heritage System

As described in Section 3.4 of the City of Toronto's Official Plan, the Natural Heritage System and Inventory comprises the following features:

- Significant landforms and physical features;
- Watercourses and hydrological features;
- Valley slopes and floodplains, riparian zones;
- Terrestrial natural habitat types;
- Significant aquatic features; and,
- Species of concern and significant biological features that are subject to the Provincial Policy Statement (Ministry of Municipal Affairs and Housing (MMAH), 2014).

Map 9 of the City of Toronto Official Plan (June, 2015) identifies portions of the Natural Heritage System that are located within the Study Area.

4.1.2.7 Ravine and Natural Feature Protection By-law – City of Toronto

The following designated Ravine and Natural Feature areas lie within the immediate vicinity of the existing Lakeshore East Rail Corridor that, either adjacent to, or bisecting it completely, and could potentially be affected by the Project:

- **Williamson Park Ravine** which bisects the existing Lakeshore East Rail Corridor between Coxwell Ave and Woodbine Ave;
- Sections of **Hollis/Kalmar Park** between Warden Ave and Danforth Ave, just south of the railroad; and
- The **Don Valley River** Natural Feature area which bisects the Lakeshore East Rail Corridor.

4.1.2.8 Vegetation Compensation Protocol

Metrolinx is establishing a Vegetation Compensation Protocol for Metrolinx Regional Express Rail (RER) projects and vegetation that is removed will be compensated for in accordance with the provisions of this protocol:

- **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 along long stretches of 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 community types/ ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final 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).

4.1.3 Naturalized Areas and Vegetation Communities

4.1.3.1 Ecological Land Classification Communities

The TRCA provided Ecological Land Classification (ELC) data of the Study Area on February 18, 2016 (collected in or by circa 2003) as well as the locations of select flora and fauna. Vegetation communities were described using the First Approximation ELC for Southern Ontario (Lee et al., 1998). These records were used for analysis purposes in preparation for field investigations.

The same few vegetation communities that are commonly encountered in urban settings were identified along the length of the Lakeshore East Rail Corridor during the ELC surveys conducted on July 12, 13 and 29, 2016. The majority of these vegetation communities were cultural, meaning that the community has resulted from, or has been

maintained by, cultural or anthropogenic disturbances (Lee *et al.*, 1998). Illustrations of ELC delineations are provided in Figures 3-01 to 3-26 of Appendix A of the Natural Environment Effects Assessment (**Appendix B1**). Detailed descriptions noting dominant plants and community structure in each type of vegetation community identified during field investigations are provided in **Section 2.2.6.2** of the Natural Environment Effects Assessment (**Appendix B1**). The following vegetation communities were identified within the Study Area:

- Cultural Hedgerow (CUH);
- Dry-Moist Old Field Meadow (CUM1-1);
- Mineral Cultural Thicket (CUT1);
- Sumac Cultural Thicket (CUT1-1);
- Mineral Cultural Woodland (CUW1);
- Deciduous Forest (FOD) – identified through aerial photo interpretation; and
- Fresh-Moist Willow Lowland Deciduous Forest (FOD7-3).

4.1.3.2 Vascular Plant Inventory

A total of 163 vascular plant species were recorded during the inventory. Of these, 86 (53%) are native and 77 (47%) are non-native species. No Species at Risk (SAR) or Species of Conservation Concern (SOCC) plants were noted within the vegetation communities investigated in July 2016. Similarly, no SOCC or SAR plants were identified through the flora records provided by TRCA. However, several regionally rare plants within the City of Toronto have been identified including Balsam Fir (*Abies balsamea*), Poison Ivy (*Toxicodendron radicans ssp. negundo*), Silky Dogwood (*Cornus amomum*), Wild Red Current (*Ribes triste*), Sycamore (*Platanus occidentalis*), American Prickly-ash (*Zanthoxylum americanum*) and Big Bluestem (*Andropogon gerardii*). A comprehensive list of all recorded vascular plants is provided in Appendix C of the Natural Environment Effects Assessment (**Appendix B1**).

4.1.4 Wildlife and Wildlife Habitat

4.1.4.1 Herpetofauna

The Ontario Reptile and Amphibian Atlas (Ontario Nature, 2015) was reviewed as part of the desktop background review. The results indicated records of 15 reptile and amphibian species which have been identified within four (4) 10 x 10 square km (km²) grids (ID: 17PJ33, 17PJ34, 17PJ43 and 17PJ44) that encompass the Study Area as shown in **Table 4-2**.

Table 4-2: Herpetofauna Records within the Natural Environment Assessment Area

Taxon	Common name	Scientific Name	S-rank ¹	ESA Status ²	SARA Status ³	Year Last Seen
Turtle	Red-eared Slider	<i>Trachemys scripta</i>	SNA	-	-	2014
Turtle	Blanding's Turtle	<i>Emydoidea blandingii</i>	S3	THR	THR-Schedule 1	2014
Turtle	Snapping Turtle	<i>Chelydra serpentina</i>	S3	SC	SC –Schedule 1	2014
Turtle	Midland Painted Turtle	<i>Chrysemys picta marginata</i>	S4	-	-	2012
Turtle	Northern Map Turtle	<i>Graptemys geographica</i>	S3	SC	SC-Schedule 1	2009
Turtle	Eastern Musk Turtle	<i>Sternotherus odouratus</i>	S3	SC	THR-Schedule 1	2003
Snake	Dekay's Brownsnake	<i>Storeria dekayi</i>	S5	-	-	2014
Snake	Eastern Gartersnake	<i>Thamnophis sirtalis sirtalis</i>	S5	-	-	2014
Snake	Milksnake	<i>Lampropeltis triangulum</i>	S4	-	-	2011
Snake	Red-bellied Snake	<i>Storeria occipitomaculata</i>	S5	-	-	1990
Amphibian	Eastern Red-backed Salamander	<i>Plethodon cinereus</i>	S5	-	-	2013
Amphibian	American Toad	<i>Anaxyrus americanus</i>	S5	-	-	2014

Taxon	Common name	Scientific Name	S-rank ¹	ESA Status ²	SARA Status ³	Year Last Seen
Amphibian	Green Frog	<i>Lithobates clamitans</i>	S5	-	-	2013
Amphibian	Northern Leopard Frog	<i>Lithobates pipiens</i>	S5	-	-	2013
Amphibian	Spring Peeper	<i>Pseudacris crucifer</i>	S5	-	-	2001

¹ **S-rank:** The natural heritage provincial ranking system (provincial S-rank) is used by the MNRF Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. The following status definitions were taken from NatureServe Explorer's (2015) National and Subnational Conservation Status Definitions available at <http://explorer.natureserve.org/nsranks.htm>:

SX - Presumed Extirpated—Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH - Possibly Extirpated (Historical)—Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for.
S1 - Critically Imperiled — Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.
S2 - Imperiled—Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.
S3 - Vulnerable—Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 - Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 - Secure—Common, widespread, and abundant in the nation or state/province.
SNR - Unranked—Province conservation status not yet assessed.
SU - Unrankable—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA - Not Applicable — A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S# - Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

Breeding Status Qualifiers

B - Breeding—Conservation status refers to the breeding population of the species in the province.
N - Nonbreeding—Conservation status refers to the non-breeding population of the species in the province.
M - Migrant—Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.
Note: A breeding status is only used for species that have distinct breeding and/or non-breeding populations in the province. A breeding-status S-rank can be coupled with its complementary non-breeding-status S-rank if the species also winters in the province, and/or a migrant-status S-rank if the species occurs regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. The two (or rarely, three) status ranks are separated by a comma (e.g., "S2B,S3N" or "SHN,S4B,S1M").

Other Qualifiers

? -Inexact or Uncertain—Denotes inexact or uncertain numeric rank. (The ? qualifies the character immediately preceding it in the S-rank.)

² **ESA Status:** The Endangered Species Act 2007 (ESA) protects species listed as Threatened and Endangered on the Species at Risk in Ontario (SARO) List on provincial and private land. The Minister lists species on the SARO list based on recommendations from the Committee on the Status of Species at Risk in Ontario (COSSARO), which evaluates the conservation status of species occurring in Ontario. The following are the categories of at risk:

END (Endangered) – A species facing imminent extinction or extirpation in Ontario.
THR (Threatened) – Any native species that, on the basis of the best available scientific evidence, is at risk of becoming endangered throughout all or a large portion of its Ontario range if the limiting factors are not reversed.
SC (Special Concern) – A species that may become threatened or endangered due to a combination of biological characteristics and identified threats.
NAR (Not at Risk) – A species that has been evaluated and found to be not at risk.

³ **SARA Status:** The Species at Risk Act (SARA) protects Species at Risk designated as Endangered, Threatened and Extirpated listed under Schedule 1, including their habitats on federal land. Schedule 1 of SARA is the official list of wildlife species at risk in Canada and includes species listed as Extirpated, Endangered, Threatened and of Special Concern. Once a species is listed on Schedule 1, they receive protection and recovery measures that are required to be developed and implemented under SARA. Species that were designated at risk by COSEWIC before SARA need to be reassessed based on the new criteria of the Act before they can be listed under Schedule 1. These species that are waiting to be listed under Schedule 1 do not receive official protection under SARA. Once the species on other schedules (2 and 3) have been reassessed, the other schedules are eliminated and the species is either listed under Schedule 1 or is not listed under the Act. The following are definitions of the SARA status rankings assigned to each species in the table above:

END (Schedule 1) – These species are listed as Endangered under Schedule 1 of SARA and receive species and habitat protection under SARA, as well as recovery strategies and action plans.
THR (Schedule 1) – These species are listed as Threatened under Schedule 1 of SARA and receive species and habitat protection under SARA, as well as recovery strategies and action plans.
SC (Schedule 1) – These species are listed as Special Concern under Schedule 1 of SARA and receive management initiatives under SARA to prevent them from becoming endangered and threatened.
No Status (No Schedule) – These species are evaluated and designated by COSEWIC but are not listed under Schedule 1 and therefore do not receive protection under SARA.
NAR (Not at Risk) – These species have either been assessed by COSEWIC as Not at Risk or there is not enough data to assess the status ranking of the species and therefore these are not listed on Schedule 1 nor do they receive protection under SARA.
Not Applicable (N / A) – These species have either been assessed by COSEWIC as Not at Risk or there is not enough data to assess the status ranking of the species and therefore these are not listed on Schedule 1 nor do they receive protection under SARA.
Source: Government of Canada, 2009: Frequently Asked Questions: What are the SARA schedules? Accessed on February 2015.
Available: <http://www.dfo-mpo.gc.ca/species-especes/faq/faq-eng.htm>

Targeted surveys for reptiles were not triggered at this phase of the Project; however, potential supporting habitat observed during ELC and other surveys was recorded if encountered, as well as any observations of individuals (visual, tracks, etc.).

Amphibian surveys were completed by qualified and experienced Biologists to assist in the identification of Significant Wildlife Habitat (SWH). Although the amphibian survey station appeared as potentially suitable amphibian breeding habitat with flowing water, there were no amphibians identified during any of the three (3) surveys conducted April 28, May 17 and June 29, 2016. Based on the results of the amphibian surveys, this potentially suitable breeding habitat is not significant due to the lack of amphibians heard calling.

4.1.4.2 Breeding Birds

Breeding bird surveys were conducted by a qualified Biologist, following the *Ontario Breeding Bird Atlas (OBBA) Guide for Participants* (2001) to determine species diversity and relative abundance within the naturalized areas in the immediate vicinity of the existing Lakeshore East Rail Corridor within the Study Area that could be potentially affected by the Project. Most of the potentially affected vegetation occurred as narrow strips along the Lakeshore East Rail Corridor; therefore, breeding bird surveys consisted of transects along areas where substantial units of vegetation were present that were determined through aerial-photo interpretation.

A total of 34 bird species were recorded between the two breeding bird surveys conducted on June 14 and June 28, 2016 along transects following the Lakeshore East Rail Corridor as shown in **Table 4-4**. The majority of the recorded bird species were common in Ontario and tolerant to disturbances associated with urban settings.

Two (2) SAR and one SOCC bird species were also recorded. Both SAR species, including Barn Swallow (*Hirundo rustica*) and Chimney Swift (*Chaetura pelagica*), are designated as Threatened under the *Endangered Species Act (ESA)* and were recorded as flyovers. Barn Swallows and Chimney Swifts often build their nests on human-made structures such as buildings and bridges (MNR, 2014b). The railway is surrounded by urban development consisting of residential, industrial and business buildings which likely provide nesting and roosting habitats for these species somewhere in the area; however, no nesting or roosting habitats for these SAR birds were identified within the Lakeshore East Rail Corridor. These species were likely flying over and foraging.

One (1) SOCC bird species, Wood Thrush (*Hylocichla mustelina*), designated as Special Concern under the *ESA* was recorded singing in Merrill Bridge Road Park. A juvenile Wood Thrush was also noted, which could be indicative that a nest was present in this woodland. Wood Thrush is also designated of regional concern (L3) in the TRCA jurisdiction. The only other species considered of regional concern (L3) observed during breeding bird surveys was Double-crested Cormorant (*Phalacrocorax auritus*). A number of species recorded during the breeding bird surveys are of concern in urban areas (L4), as designated by TRCA, including Barn Swallow, Chimney Swift, Gray Catbird (*Dumetella carolinensis*), Hairy Woodpecker (*Picoides villosus*), Indigo Bunting (*Passerina cyanea*), Red-eyed Vireo (*Vireo olivaceus*), Ring-billed Gull (*Larus delawarensis*), Rose-breasted Grosbeak (*Pheucticus ludovicianus*), Tree Swallow (*Tachycineta bicolor*) and White-breasted Nuthatch (*Sitta carolinensis*).

4.1.4.3 Mammals

According to the Atlas of the Mammals of Ontario (Dobbyn, 1994) and Bats Conservation International (BCI; 2016), there are several mammals that are known to occur within and in the vicinity of the Study Area, as shown in **Table 4-3** below.

Table 4-3: Mammal Records within the Natural Environment Assessment Area

Taxon	Common Name	Scientific Name	S-Rank ¹	ESA Status ²
Bat	Little Brown Myotis	<i>Myotis lucifugus</i>	S4	END
	Hoary Bat	<i>Lasiurus cinereus</i>	S4	-
	Silver-haired Bat	<i>Lasionycteris noctivagans</i>	S4	-
	Eastern Red Bat	<i>Lasiurus borealis</i>	S4	-
	Eastern Small-footed Myotis	<i>Myotis leibii</i>	S2S3	END
	Northern Long-eared Myotis	<i>Myotis septentrionalis</i>	S3	END
	Big Brown Bat	<i>Eptesicus fuscus</i>	S5	-
	Tri-coloured Bat	<i>Perimyotis subflavus</i>	S3?	END
Carnivore	Common Raccoon	<i>Procyon lotor</i>	S5	-
	Coyote	<i>Canis latrans</i>	S5	-
	Striped Skunk	<i>Mephitis mephitis</i>	S5	-
	Red Fox	<i>Vulpes vulpes</i>	S5	-
Hare	European Hare	<i>Lepus europaeus</i>	SNA	-
Mole	Star-nosed Mole	<i>Condylura cristata</i>	S5	-
Opossum	Virginia Opossum	<i>Didelphis virginiana</i>	S4	-
Rabbit	Eastern Cottontail	<i>Sylvilagus floridanus</i>	S5	-
Rodent	Beaver	<i>Castor canadensis</i>	S5	-
	Deer Mouse	<i>Peromyscus maniculatus</i>	S5	-
	Eastern Gray Squirrel	<i>Sciurus carolinensis</i>	S5	-
	Eastern Chipmunk	<i>Tamias striatus</i>	S5	-
	Groundhog	<i>Marmota monax</i>	S5	-
	House Mouse	<i>Mus musculus</i>	SNA	-
	Meadow Vole	<i>Microtus pennsylvanicus</i>	S5	-
	Porcupine	<i>Erethizon dorsatum</i>	S4	-
	Norway Rat	<i>Rattus norvegicus</i>	SNA	-
	Muskrat	<i>Ondatra zibethicus</i>	S5	-
	White-footed Mouse	<i>Peromyscus leucopus</i>	S5	-
Weasel	American Mink	<i>Mustela vison</i>	S4	-

Notes: See notes under **Table 4-2**.

The majority of the mammals identified through background review are considered common and secure throughout Ontario with the exception of four species of bats. Habitat for these is available within the Study Area; consultation with MNRF during Detailed Design will confirm if the targeted surveys recommended in **Section 5** will be required.

4.1.4.4 Wildlife Habitat

The Natural Environment Assessment Area and the Study Area are located within the Ecoregion – 7E (Lake Erie-Lake Ontario Ecoregion). The *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015e) contains information and criteria for identifying SWH, which are defined as areas that have important ecological features and functions and support sustainable populations of plants, wildlife and other organisms within this Ecoregion. The MNRF generally categorizes SWH into the following:

- Seasonal concentration areas;
- Rare vegetation communities or specialized habitats for wildlife;
- Habitats of species of conservation concern; and
- Animal Movement Corridors.

The results of the terrestrial field investigations were used to identify the presence of SWH in the Study Area.

Seasonal Concentration Areas

There are several bat species that can be found within and in the vicinity of the Study Area. In the summer, male and female bats of these species can generally be found roosting in a variety of structures including tree cavities, attics and buildings. Reproductive females form maternity colonies and rear their young during the sensitive maternity roosting period through June and July (MNRF, 2015f). Suitable bat maternity roost habitat may occur within the FOD7-3 and FOD communities in the Study Area. Although no suitable cavity trees were identified, visibility was limited as ELC surveys were conducted in July 2016 during the leaf-on season. No other habitats which could potentially support seasonal concentrations of animals were identified within the Study Area.

Table 4-4: Results of Breeding Bird Surveys

Inventory of Breeding Birds for Metrolinx Lakeshore East Rail Corridor Expansion Don River to Scarborough GO Station Project										Location:	Queen St. to Dundas St. E		Dundas St. E to Gerrard St. E		Woodfield Rd. and Coxwell Ave.		Coxwell Ave. to Kingsmount Park Rd.		Kingsmount Park Rd. to Woodbine Ave.		Victoria Park Ave. to Byng Ave.		Leyton Ave. to Kalmar Ave.		Aylesworth Ave. to Wilkie Ave.		St. Clair Ave. E and Midland Ave.		Total No. of Individuals per Species	
										Survey Date:	14/06/2016	28/06/2016	14/06/2016	28/06/2016	14/06/2016	28/06/2016	14/06/2016	28/06/2016	15/06/2016	29/06/2016	15/06/2016	29/06/2016	15/06/2016	29/06/2016	15/06/2016	29/06/2016	15/06/2016	2/069/2016		
Common Name	Scientific Name	ESA Status	SARA Status	COSEWIC Status	NHIC Status Ranking ¹	Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan ²	Area-sensitive Species ³	L-Rank ⁴	Protected under MBCA (Yes/No)	Temperature (T); End Time (ET) and Start Time (ST); Cloud Cover (CC)	T (°C): 12-18 ST: 06:00 ET:06:50 B.S.: 0-2 CC(%): 10	T (°C): 22 ST: 06:00 ET: 06:50 B.S.: 0-1 CC (%): 100	T (°C): 12-18 ST: 06:55 ET: 07:35 B.S.: 0-2 CC (%): 10	T (°C): 19-22 ST: 07:30 ET:08:00 B.S.: 0-1 CC (%): 100	T (°C): 12-18 ST: 07:45 ET:08:10 B.S.: 0-2 CC (%): 10	T (°C): 19-22 ST: 07:00 ET:07:25 B.S.: 0-1 CC (%): 100	T (°C): 12-18 ST: 08:20 ET:09:40 B.S.: 0-2 CC (%): 10	T (°C): 19-22 ST: 05:30 ET:06:50 B.S.: 0-1 CC (%): 100	T (°C): 12-22 ST: 05:40 ET:06:20 B.S.: 0 CC (%): 0	T (°C): 16 ST: 05:40 ET:06:15 B.S.: 1-2 CC (%): 100F	T (°C): 12-22 ST: 06:30 ET:08:00 B.S.: 0 CC (%): 0	T (°C): 16 ST: 06:30 ET:07:50 B.S.: 1-2 CC (%): 100	T (°C): 12-22 ST: 08:15 ET:08:45 B.S.: 0 CC (%): 2	T (°C): 12-22 ST: 08:15 ET:08:45 B.S.: 0 CC (%): 3	T (°C): 22 ST: 08:50 ET:09:20 B.S.: 0-2 CC (%): 0	T (°C): 20 ST: 08:55 ET:09:25 B.S.: 1 CC (%): 20	T (°C): 22 ST: 09:30 ET:10:00 B.S.: 0-2 CC (%): 0	T (°C): 22 ST: 09:30 ET:10:00 B.S.: 1 CC (%): 20		
American Crow	Corvus brachyrhynchos				S5			L5	No		1		1			1	1										1		5	
American Goldfinch	Carduelis tristis				S5			L5	Yes		1	1	1	1	1	1	1					1			2	1	1	1	1	13
American Robin	Turdus migratorius				S5			L5	Yes		6	4	1	1	2	2	3	4	3	1	5	3	4	2	2		3	1		47
Baltimore Oriole	Icterus galbula				S4	✓		L5	Yes									3	4	1										8
Barn Swallow	Hirundo rustica	THR		THR	S4			L4	Yes								1 - Flyover					2 - Flyovers								0
Blue Jay	Cyanocitta cristata				S5			L5	No							1				1	2	1								5
Brown-headed Cowbird	Molothrus ater				S4			L5	No														1	1						2
Chimney Swift	Chaetura pelagica	THR	THR Schedule 1	THR	S4	✓		L4	Yes		1 - Flyover					1 - Flyover		3 - Flyover	5 - Flyover		1 - Flyover									0
Common Grackle	Quiscalus quiscula				S5			L5	No				1			1					1	1	3		2	3				13
Double-crested Cormorant	Phalacrocorax auritus				S5			L3	No		1				1															2
Downy Woodpecker	Picoides pubescens				S5			L5	Yes			1			1		1				1		1							5
European Starling	Sturnus vulgaris				SNA			L+	No			1	2	1					1		1				1	1				8
Gray Catbird	Dumetella carolinensis				S4			L4	Yes								2	3			3	2	2	2	2		1			17
Hairy Woodpecker	Picoides villosus				S5		A	L4	Yes											1										1
House Finch	Carpodacus mexicanus				SNA			L+	Yes		1																			1
House Sparrow	Passer domesticus				SNA			L+	No		15	9	10	11	3	3	10	4	2	1	3	1	7	2	1		1			83
House Wren	Troglodytes aedon				S5			L5	Yes															1						1
Indigo Bunting	Passerina cyanea				S4			L4	Yes													1	1	1				1		4
Killdeer	Charadrius vociferus				S5			L5	Yes												1				1		1			3
Mourning Dove	Zenaida macroura				S5			L5	Yes					1					1		1		2		2		1	1		9
Northern Cardinal	Cardinalis cardinalis				S5			L5	Yes		1	1	1		1	2	1	1	3	2		1		2						16
Northern Mockingbird	Mimus polyglottus				S4			L5	Yes																		1	1		2
Red-eyed Vireo	Vireo olivaceus				S5			L4	Yes		3	1	2		0	1	2	3	1			1	1							15
Red-tailed Hawk	Buteo jamaicensis				S4			L5	No																			4		4
Red-winged Blackbird	Agelaius phoeniceus				S4			L5	No										1		3	2	2	2	10	6	4	2		32
Ring-billed Gull	Larus delawarensis				S5			L4	Yes		1		1		1		2			1	1		1		1					9
Rock Pigeon	Columba livia				SNA			L+	No		2		3	1							1		1		1	2				11
Rose-breasted Grosbeak	Pheucticus ludovicianus				S4	✓		L4	Yes											1										1
Song Sparrow	Melospiza melodia				S5			L5	Yes													1			1	1	2			5
Tree Swallow	Tachycineta bicolor				S4			L4	Yes													1			1					2
Warbling Vireo	Vireo gilvus				S5			L5	Yes														1							1
White-breasted Nuthatch	Sitta carolinensis				S5		A	L4	Yes		1						1	2					1							5
Wood Thrush	Hylocichla ustulata	SC		THR	S4	✓		L3	Yes							1														1
Yellow Warbler	Dendroica petechia				S5			L5	Yes												4	1								5
Total No. of Species Recorded:	34	Total No. of Individuals per Location:									33	18	23	16	10	11	21	22	14	11	29	21	29	12	25	15	14	12		336

Notes:

Glossary

ESA - Endangered Species Act (Provincial)

EXP - Extirpated - a species that no longer exists in the wild in Ontario but still occurs elsewhere.
END - Endangered - a species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act.
THR - Threatened - a species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
SC - Special Concern (formerly Vulnerable) - a species with characteristics that make it sensitive to human activities or natural events.

OMNR - Ontario Ministry of Natural Resources

SARA - Species at Risk Act (Federal)

EXP - Extirpated - a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END - Endangered - wildlife species that is facing imminent extirpation or extinction.
THR - Threatened - wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC - Special Concern a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Schedule 1 - The official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2 - Species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3 - Species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

COSEWIC - Committee on the Status of Endangered Wildlife in Canada

NHIC - Natural Heritage Information Centre

S1 - Critically Imperiled, often < 5 occurrences
S2 - Imperiled, often <20 occurrences
S3 - Vulnerable, often 80 or fewer
S3S4 - Uncertain between S3 and S4
S4 - Apparently Secure, common
S5 - Secure, common
SNA - Not Applicable — A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
SH - Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered.

TRCA L-Rank

L1 - Species of Concern regionally and almost certainly rare in the TRCA jurisdiction. Species are unable to withstand disturbance and occur in high-quality natural areas in natural settings.
L2 - Species of Concern regionally and probably rare in the TRCA jurisdiction. Species are unable to withstand disturbance and occur in high-quality natural areas in natural settings.
L3 - Species of Concern regionally throughout TRCA jurisdiction. Species are able to withstand minor disturbance. Species are generally secure in natural settings.
L4 - Species of Concern in urban areas but secure and not of concern in rural settings. Species able to withstand some disturbance.
L5 - Species not of Concern and generally secure throughout the TRCA jurisdiction, including urban and rural settings. Species are able to withstand high levels of disturbance.
L+ - Exotic and not native to TRCA jurisdiction.

Beaufort Wind Speed Codes

0 0-2 km/h, calm
1 3-5 km/h, light air movement
2 6-11 km/h, slight breeze, can feel on face
3 12-19 km/h, gentle breeze, leaves move on twigs
4 20-30 km/h, moderate breeze, small branches move
5 31-38 km/h, fresh breeze, moderate branches move
6 39-49 km/h, strong breeze, large branches move

References

- 1 - Ontario Ministry of Natural Resources. 2009. Natural Heritage Information Centre
- 2 - Ontario Partners in Flight. 2008. Ontario Landbird Conservation Plan: Lower Great Lakes/St. Lawrence Plain, North American Bird Conservation Region 13. Ontario Ministry of Natural Resources, Bird Studies Canada, Environment Canada.
- 3 - Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (Appendix G). 151 p plus appendices.
- 4 - Toronto Region and Conservation Authority (TRCA). Fauna Ranks and Scores, July 2016. Accessed on September 19, 2016. Available: <https://trca.ca/conservation/environmental-monitoring/environmental-monitoring-resource-library/>

Rare Vegetation Communities or Specialized Habitats for Wildlife

No rare vegetation communities were identified during ELC surveys conducted in July 2016. There is potential for specialized habitats for wildlife to occur in the Study Area. Candidate significant woodland amphibian breeding habitat was initially identified via aerial photograph interpretation within the riparian area of deciduous forest (FOD) located in Merrill Bridge Road Park (refer to Figure 3-10 in Appendix A of the Natural Environment Effects Assessment (**Appendix B1**) for location); however, this habitat was confirmed as not significant given the absence of amphibians, based on three rounds of nocturnal breeding amphibian call-count surveys completed in 2016. Therefore, no negative effects to habitat harbouring breeding amphibian populations are anticipated to result from this Project.

Habitats of Species of Conservation Concern

Potential habitat for SOCC within the Study Area was identified during the background information review. No provincially rare (S1-S3, SH) or Special Concern plants were observed during ELC surveys conducted in July 2016. Wood Thrush, listed as Special Concern under the *ESA*, was observed during breeding bird surveys in the FOD7-3 community located in Merrill Bridge Road Park.

Animal Movement Corridors

No potential animal movement corridors were identified within the Study Area or Natural Environment Assessment Area.

4.1.4.5 Terrestrial Species at Risk and Species of Conservation Concern

SAR with the potential of occurring in the Study Area were identified through background literature review, MNRF consultation, and habitat assessments completed in conjunction with the field investigations. This included screening the preferred habitat of each SAR and SOCC known to occur in the vicinity of the Natural Environment Assessment Area against the existing habitat conditions observed during the field investigations. **Table 4-5** highlights SAR and SOCC screening results, including the presence of suitable habitat within the Natural Environment Assessment Area. The results of this screening indicate that the following SAR and SOCC have the potential to occur within the Natural Environment Assessment Area based on the presence of suitable habitat:

Species not observed during field investigations:

- Eastern Small-footed Bat;
- Little Brown Bat;
- Northern Long-eared Bat;
- Tri-coloured Bat;
- Butternut;
- Common Nighthawk;
- Eastern Wood-pewee; and,
- Red-headed Woodpecker.

Species with confirmed observations during 2016 field investigations:

- Barn Swallow;
- Chimney Swift; and,
- Wood Thrush.

Table 4-5: SAR and SOCC Screening within the Natural Environment Assessment Area

Taxonomy	Species	COSEWIC Status	Presence of Suitable Habitat within the Study Area
SAR			
Mammals	Eastern Small-footed Bat <i>Myotis leibii</i>	END	Although no suitable cavity trees were identified during terrestrial field investigations, these were conducted in July 2016 during the leaf-on season which would have reduced visibility required to see suitable cavities on trees. Potentially suitable cavity trees for roosting bats may be present within the FOD7-3 community. Species-specific surveys were not completed.
Mammals	Little Brown Bat <i>Myotis lucifugus</i>	END	Although no suitable cavity trees were identified during terrestrial field investigations, these were conducted in July 2016 during the leaf-on season which would have reduced visibility required to see suitable cavities on trees. Potentially suitable cavity trees for roosting bats may be present within the FOD7-3 community. Species-specific surveys were not completed.
Mammals	Northern Long-eared Bat <i>Myotis septentrionalis</i>	END	Although no suitable cavity trees were identified during terrestrial field investigations, these were conducted in July 2016 during the leaf-on season which would have reduced visibility required to see suitable cavities on trees. Potentially suitable cavity trees for roosting bats may be present within the FOD7-3 community. Species-specific surveys were not completed.
Mammals	Tri-colored Bat <i>Perimyotis subflavus</i>	END	Although no suitable cavity trees were identified during terrestrial field investigations, these were conducted in July 2016 during the leaf-on season which would have reduced visibility required to see suitable cavities on trees. Potentially suitable cavity trees for roosting bats may be present within the FOD7-3 community. Species-specific surveys were not completed.
Plants	Butternut <i>Juglans cinerea</i>	END	The FOD7-3 community is considered to be potentially suitable for Butternut; however, this species was not recorded during the terrestrial field investigations where the new track is proposed within this vegetation community. Butternut may occur throughout other portions of the Study Area where it will not be out-competed by other vegetation, given its strong shade-intolerance.
Birds	Bank Swallow <i>Riparia riparia</i>	THR	No suitable banks or active sand or gravel pits were noted along the Lakeshore East Rail Corridor during terrestrial field investigations.
Birds	Barn Swallow <i>Hirundo rustica</i>	THR	There is an abundance of man-made structures within and in the vicinity of the Study Area including buildings, culverts and bridges that could provide suitable nesting habitat. Barn Swallows were observed flying over during the breeding bird surveys; however, no nesting structures were observed within the Lakeshore East Rail Corridor along bridges or culverts during any of the field investigations. Therefore, it is likely that Barn Swallows are nesting elsewhere in the Study Area, but not in the actual Lakeshore East Rail Corridor.
Birds	Bobolink <i>Dolichonyx oryzivorus</i>	THR	Generally, there are no large (>4 ha) open grassy fields within the Study Area. The majority of the area consists of treed areas and manicured parks with mowed lawns. The CUM1-1 communities identified within the Lakeshore East Rail Corridor are too small and linear to provide suitable habitat for this species. Therefore, this species does not occur as a breeding species within the Lakeshore East Rail Corridor.
Birds	Chimney Swift <i>Chaetura pelagica</i>	THR	There is an abundance of man-made structures within and in the vicinity of the Study Area including buildings, culverts and bridges that could provide suitable nesting habitat. Chimney Swifts were observed flying over during the breeding bird surveys; however, no suitable nesting structures were observed within the Lakeshore East Rail Corridor during any of the field investigations. Therefore, it is likely that Chimney Swifts are nesting elsewhere in the vicinity of the Study Area.

Table 4-5: SAR and SOCC Screening within the Natural Environment Assessment Area

Taxonomy	Species	COSEWIC Status	Presence of Suitable Habitat within the Study Area
Birds	Eastern Meadowlark <i>Sturnella magna</i>	THR	Generally, there are no large (>4 ha) open grassy fields within the Study Area. The majority of the area consists of treed areas and manicured parks with mowed lawns. The CUM1-1 communities identified within the Lakeshore East Rail Corridor are too small and linear to provide suitable habitat for this species. Therefore, this species does not occur as a breeding species within the Lakeshore East Rail Corridor.
Reptiles	Blanding's Turtle <i>Emydoidea blandingii</i>	THR	Suitable habitat for this species is not present within the Lakeshore East Rail Corridor or within the Study Area given the lack of wetlands present.
SOCC			
Birds	Black crowned night heron <i>Nycticorax nycticorax</i>	-	No suitable habitat for this species is present within the Lakeshore East Rail Corridor or within the Study Area.
Birds	Canvasback <i>Aythya valisineria</i>	-	No suitable habitat for this species is present within the Lakeshore East Rail Corridor or within the Study Area.
Birds	Caspian Tern <i>Hydroprogne caspia</i>	-	No suitable habitat for this species is present within the Lakeshore East Rail Corridor or within the Study Area.
Birds	Common Nighthawk <i>Chordeiles minor</i>	THR	Marginal habitat may be present for Common Nighthawk along the gravel railway bed; however, these areas are highly disturbed by trains and human presence such that it is highly unlikely that this species would be nesting there. However, more potentially suitable habitat outside of the Lakeshore East Rail Corridor and in the vicinity of the Study Area may be present on the roofs of buildings.
Birds	Eastern Wood-Pewee <i>Contopus virens</i>	SC	Suitable habitat is present within the Lakeshore East Rail Corridor and the Study Area in the form of CUW1 and FOD7-3. However, this species was not recorded during the breeding bird surveys.
Birds	Great Black-backed Gull <i>Larus marinus</i>	-	No suitable habitat is present for this species within the Lakeshore East Rail Corridor or Study Area.
Birds	Great Egret <i>Ardea alba</i>	-	No suitable habitat for this species is present within the Lakeshore East Rail Corridor or within the Study Area.
Birds	Peregrine Falcon <i>Falco peregrinus</i>	SC	Generally, Peregrine Falcons prefer to nest in tall buildings and skyscrapers. All of the buildings located along Don River to Scarborough GO Station were low-rise residential homes or industrial / manufacturing buildings. Therefore suitable habitat for this species is not present within the Lakeshore East Rail Corridor or the Study Area.
Birds	Redhead <i>Aythya Americana</i>	-	No suitable habitat for this species is present within the Lakeshore East Rail Corridor or within the Study Area.
Birds	Red-headed Woodpecker <i>Melanerpes erythrocephalus</i>	THR	Potentially suitable habitat for Red-headed Woodpecker may be present within the FOD7-3 community but none were recorded during breeding bird surveys.
Birds	Short-eared Owl <i>Asio flammeus</i>	SC	No suitable habitat is present for this species within the Study Area as there are no presences of extensive grasslands or marshes. Open areas such as CUM1-1 are generally too small and disturbed to be considered suitable habitat for this species.
Birds	Wood Thrush <i>Hylocichla mustelina</i>	THR	Suitable habitat for this species includes the FOD7-3 community, City Parks and CUW1 communities. This species was recorded during the breeding bird surveys at one location in a small isolated mature forest.
Reptiles	Eastern Musk Turtle (Stinkpot) <i>Sternotherus odouratus</i>	SC	Suitable habitat for this species is not present within the Lakeshore East Rail Corridor or within the Study Area given the lack of wetlands present.

Table 4-5: SAR and SOCC Screening within the Natural Environment Assessment Area

Taxonomy	Species	COSEWIC Status	Presence of Suitable Habitat within the Study Area
Reptiles	Northern Map Turtle <i>Graptemys geographica</i>	SC	No suitable habitat for this species is present within the Lakeshore East Rail Corridor or Study Area. The section of the Don River that intersects with the Study Area is fast moving with minimal basking structures. Furthermore, there are reinforced retaining walls on either side of the Don River within this section which do not provide suitable nesting habitat. The gravel/cobble present along the tracks are likely too big to be suitable for nesting and these areas are generally fenced off or located on a berm and away from large waterbodies and wetlands such that no suitable habitat for this species is present within the Lakeshore East Rail Corridor.
Reptiles	Snapping Turtle <i>Chelydra serpentina</i>	SC	No suitable habitat for this species is present within the Lakeshore East Rail Corridor or Study Area. The section of the Don River that intersects with the Study Area is fast moving with minimal basking structures. Furthermore, there are reinforced retaining walls on either side of the Don River within this section which do not provide suitable nesting habitat. The gravel/cobble present along the tracks are likely too big to be suitable for nesting and these areas are generally fenced off or located on a berm and away from large waterbodies and wetlands such that no suitable habitat for this species is present within the Lakeshore East Rail Corridor.

4.1.5 Fish and Fish Habitat

4.1.5.1 Watershed Description

The Study Area lies within the Don River watershed which falls under the jurisdiction of the TRCA. The Lakeshore East Rail Corridor passes through the Don River sub-watershed (TRCA, 2009b). The Don River is approximately 80% urbanized with almost half of the watershed dedicated to residential development (TRCA, 2009a; TRCA, 2009c). As one of the most disturbed watersheds in the TRCA's jurisdiction, the natural cover that remains is mostly along the larger valleys and in the headwaters which serve as wildlife refuges and a recreational magnet for the 1.2 million residents that live within its boundaries (TRCA, 2009a; TRCA, 2009c). The Don River watershed has suffered extensive degradation as a result of the removal of natural cover and the alteration of the hydrologic system through the spread of agriculture and subsequent urbanization of the watershed. Lack of effective stormwater control has resulted in flooding, erosion, poor water quality and degraded terrestrial and aquatic ecosystems. Rising population density has led to further development and expanded areas of impervious ground cover as well as a heavy use of public greenspaces and natural areas (TRCA, 2009c).

4.1.5.2 Existing Watercourse Crossings

A total of two (2) watercourse crossings, identified as the Don River and Small's Creek, exist along the Lakeshore East Rail Corridor within the Study Area and are mapped in **Figure 4-2**. An additional watercourse, Taylor/Massey Creek was identified outside of the Study Area (also shown in **Figure 4-2**) located within the larger 500 m buffer considered for the background desktop review; however, it is not anticipated to be directly or indirectly impacted by the Project and as such not discussed further.

On April 28, 2016, AECOM Ecologists conducted an aquatic habitat assessment to document the existing conditions of the two (2) watercourses along the Lakeshore East Rail Corridor.

A description of the two (2) known watercourses potentially affected by the Project is provided below. The description includes a summary of field results, with additional details and a photographic log of each watercourse crossing provided in **Appendix B1**.

Don River

The Project crosses the Don River at its western extent as shown in **Figure 4-2**. The total length of the Don River within the Study Area is approximately 603 m. The Natural Environment Assessment Area used for the background data review incorporates a total reach of 828 m.

Based on DFO's Species At Risk Mapping, no aquatic SAR were identified within the Don River within the Study Area. Based on consultation with the MNRF indicates that there are no aquatic SAR reported for the Study Area. Consultation with TRCA indicated that the Don River is considered a warmwater thermal regime providing habitat for a mixture generally common cool to warmwater forage and sport fish species intermittently tolerant of environmental perturbation. Detailed information with respect to the number of each species caught, their provincial rank, location and year found, and numbers caught are provided in **Table 4-6**.

The assessment of upstream and downstream reach shows evidence of prior re-alignment to accommodate urban transportation corridor development and is hardened with little natural features present. Overall, the Don River within the Study Area provides direct fish habitat important for migration, feeding and refuge; however, conditions are generally non-limiting throughout with no specialized (critically limiting spawning habitat) identified. Migratory species (i.e., Salmon) likely use the Don River as a seasonal migratory corridor to and from Lake Ontario as no barriers to fish use were identified.

Small's Creek

Small's Creek is a small urbanized water feature traversing the Study Area in a north-south direction, existing as a limited above groundwater feature just east of Coxwell Avenue and west of Woodbine Avenue. Small's Creek exists as truncated feature that has been generally re-directed below ground as a result of urban development and is limited to approximately 803 m of above grade water feature within the Study Area.

Based on DFO's Species at Risk Mapping, no aquatic SAR were identified within Small's Creek within the Study Area. Correspondence with MNRF Aurora District Office and TRCA indicated that the thermal regime for this watercourse is warmwater; however, there were no historical fish community records available for Small's Creek within the Study Area.

The assessment of upstream and downstream reach shows that this reach may provide limited marginal fish habitat, based on its intermittent nature, barriers to fish use, shallow water levels and dense vegetation choking the channel and poorly defined structure in places.

Aquatic Species Composition

Fish community records for the Don River were provided via TRCA correspondence dated February 18, 2016. These records range from 1949 to 2002 and are summarized in **Table 4-6** and their locations are mapped in **Figure 4-2**.

Table 4-6: Aquatic Species Records from the Don River within the Natural Environment Assessment Area

Species	Scientific Name	S-Rank ¹	Thermal Preference ²	Tolerance to Environmental Perturbation ²	Year Found	Total Number
Fathead minnow	<i>Pimephales promelas</i>	S5	Warmwater	Tolerant	1949	1
					2011	5
					1983	1
Alewife	<i>Alosa pseudoharengus</i>	SNA	Coldwater	Intermediate	1998	54
					1949	1
Common carp	<i>Cyprinus carpio</i>	SNA	Warmwater	Tolerant	1998	2
					2002	1
Spottail shiner	<i>Notropis hudsonius</i>	S5	Coolwater	Intermediate	2002	1
					1984	29
Emerald shiner	<i>Notropis atherinoides</i>	S5	Coolwater	Intermediate	1984	10
					1998	10
White sucker	<i>Catostomus commersoni</i>	S5	Coolwater	Tolerant	1983	1
					1998	2
					1984	3
					2002	21
Gizzard shad	<i>Dorosoma cepedianum</i>	S4	Coolwater	Tolerant	1998	1
Bluntnose minnow	<i>Pimephales notatus</i>	S5	Warmwater	Intermediate	1983	1
Creek chub	<i>Semotilus atromaculatus</i>	S5	Coolwater	Tolerant	1983	1
Goldfish	<i>Carassius auratus</i>	SNA	Warmwater	Tolerant	1983	1
Northern redbelly dace	<i>Phoxinus eos</i>	S5	Coolwater	Intermediate	1983	1
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	SNA	Coldwater	Intolerant	2002	1
Northern pike	<i>Esox lucius</i>	S5	Coolwater	Intermediate	2002	1
Pumpkinseed	<i>Lepomis gibbosus</i>	S5	Warmwater	Intermediate	2002	1

Notes: ¹ **S-rank:** The Natural Heritage provincial ranking system (provincial S-rank) is used by the MNRF Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. Definitions are as follows:

S1 Extremely rare in Ontario; usually 5 or fewer occurrences in the province or very few remaining individuals;

S2 Very rare in Ontario; usually between 5 and 20 occurrences in the province or with many individuals in fewer occurrences;

S3 Rare to uncommon in Ontario; usually between 20 and 100 occurrences in the province;

S4 Common and apparently secure in Ontario; usually with more than 100 occurrences in the province.

S5 Very common and demonstrably secure in Ontario.

SX Extirpated from Ontario.

SH Possibly Extirpated (Historical)

SNA Not Assigned

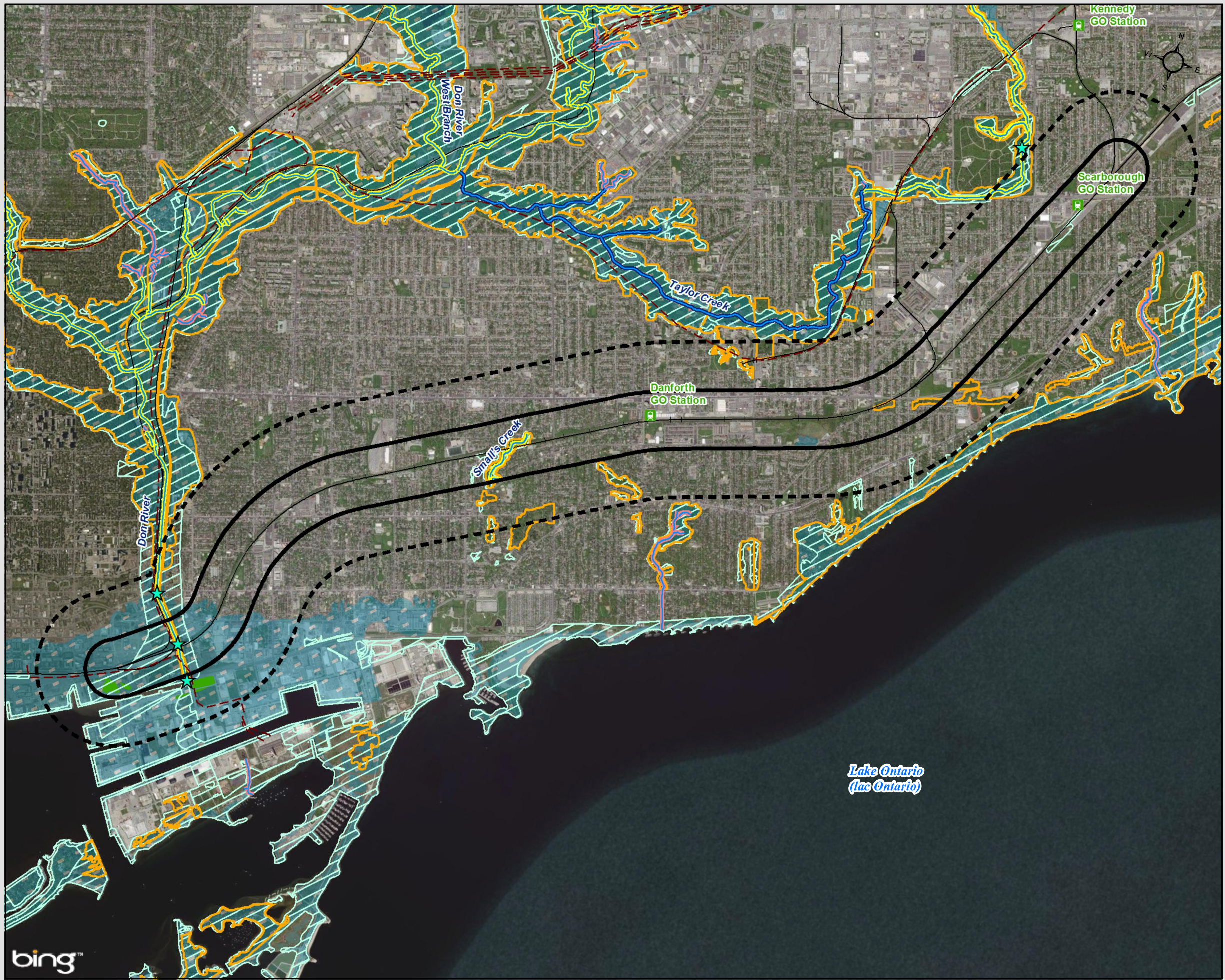
² Thermal preference and tolerance to environmental perturbation obtained from *The Ontario Freshwater Fish Life History Database* (<http://www.fishdb.ca/home.htm>).

4.1.5.3 Aquatic Species at Risk (SAR) and Species of Conservation Concern (SOCC)

NHIC Rare Species Records include historical documentation of Lake Sturgeon and Redside Dace in the larger watershed, as shown in **Table 4-7**. Within the assessed reach, suitable habitat conditions do not exist for either species. Further, based on the DFO's Species at Risk Mapping, MNRF and TRCA correspondence, no aquatic SOCC were identified within the Natural Environment Assessment Area.

Table 4-7: NHIC Rare Fish Species Records

Species	COSEWIC Status	COSSARO Status
Lake Sturgeon	Threatened	Threatened
Redside Dace	Endangered	Endangered



Legend

Study Area

Assessment Area (500 m buffer)

GO Station

Railway

Utility Line

Waterbody

TRCA Fish Sites

City of Toronto's Ravine and Natural Feature Protection

TRCA Regulation Limits

TRCA's Terrestrial and Natural Heritage System

City of Toronto's Official Plan Natural Heritage System

Watercourse Thermal Regime

Cold

Cool

Warm

Unknown

0 250 500 1,000 1,500 2,000 2,500
1:39,000
NAD 83 Zone 17N

Contains information licensed under the Open Government Licence – Toronto, and Open Government Licence – Canadas. © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2017 Microsoft Corporation . This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Lakeshore East Rail Corridor Expansion
(Don River to Scarborough GO Station) Project
Environmental Project Report

**Aquatic Natural Heritage
Features**

April 2017



Figure 4-2

4.2 Soils and Groundwater

4.2.1 Methods

For this assessment, a desktop study was conducted to provide a general characterization of existing local geological and hydrogeologic conditions of the Study Area. Available background data and information used to characterize the general soils and hydrogeologic conditions of the Study Area as it relates to regional physiographic and hydrogeological regimes was interpreted from available secondary source data including:

- Quaternary geological mapping from the Ontario Geological Survey (OGS);
- Bedrock geological mapping from OGS;
- Bedrock topography mapping from OGS;
- Ministry of the Environment and Climate Change (MOECC) Water Well Records; and
- Soil survey reports from the Ministry of Agriculture and Food.

In addition, consideration has been given to the Phase I and Phase II Environmental Site Assessments (ESAs) completed by SPL Beatty in 2011 (on file at Metrolinx) as part of due diligence activities for the Lakeshore East Rail Corridor from the Don Valley Parkway (City of Toronto) to Frenchman's Bay (City of Pickering).

4.2.2 Geological Setting

4.2.2.1 Topography and Physiography

The Study Area is located within two (2) distinct physiographic regions. The western portion of the existing rail corridor, from Don River to approximately Warden Avenue, lie within the Iroquois Plain, whereas the remaining northeastern portion of the Study Area is located within the South Slope physiographic region (Chapman and Putnam, 1984).

The Iroquois Plain is described as lowland bordering on Lake Ontario, representing the historic shoreline of Lake Iroquois during the last glacial period. Permeable sands and depositional features such as cliffs, bars, beaches and boulder pavements comprise much of the northern portion of the region. Along the present-day shoreline of Lake Ontario within the City of Toronto, the Iroquois Plain is dominated by sand plains, beveled till plains and beaches. The Study Area overlies a tract of sand plains and transects a prominent beach landform.

The northeastern portion of the Study Area, from approximately Warden Avenue to Midland Avenue, lies within the South Slope physiographic region. The South Slope is an area defined as the southern slope of the Oak Ridges Moraine. The Study Area lies within a region of the South Slope characterized as smoothed and faintly drumlinized.

The ground surface topography within the Study Area is characterized as flat to slightly undulating, with a decreasing elevation towards the east and a general southward decline toward Lake Ontario.

4.2.2.2 Overburden Geology

The bedrock within the Study Area is overlain by thick successions of unconsolidated sediments, known as overburden, which was deposited during the Quaternary Period. Overburden deposits within the Study Area were primarily deposited by glacial lakes and the Laurentide Ice Sheet during the Wisconsin glacialiation of the Pleistocene approximately 20,000 years ago. The Study Area was subject to a complex glacial history resulting in extremely complex stratigraphy in the overburden deposits.

Surficial geology within the Study Area is reported by Sharpe (1980) to consist of i) Modern alluvial deposits (clay, silt, sand, gravel, and organic remains) within the Don River Valley, ii) Coarse-textured glaciolacustrine deposits (sand and gravel) that dominate the western portions of the Study Area, iii) Clayey silt till (Halton Till) within the eastern portion of the Study Area and, vi) Silty clay to silt till (Sunnybrook Till) that occur as isolated outcrops in the vicinity of Union Station, at Pape Avenue and Greenwood Avenue. Man-made deposits of fill are expected to be present within areas of urban development and along the existing rail corridor; however these deposits are not shown on existing geological mapping by Sharpe (1980).

4.2.2.3 Bedrock Geology

According to the OGS (1991), bedrock formations of Upper Ordovician age underlie the Study Area, and are referred to as the Georgian Bay Formation and Blue Mountain Formation. The Georgian Bay formation is an interbedded grey-green to dark grey shale and fossiliferous calcareous siltstone to limestone. The Blue Mountain Formation gradationally underlies the Georgian Bay Formation and is described as a dark blue-grey to brown to black shale with thin interbeds of limestone or calcareous siltstone (Armstrong and Dodge, 2007).

Due to a lack of MOECC water well records that encounter bedrock within the Study Area, the depth to bedrock can only be interpreted from bedrock topography mapping available from the Ministry of Northern Development and Mines (Rogers *et al.*, 1961). In this mapping, the upper bedrock contact is reported to reside locally at depths ranging between 30 m and 75 m below ground surface (mBGS), with bedrock closest to surface within the Don River valley.

4.2.3 Existing Hydrogeological Setting

Surficial geology and physiography of the City of Toronto provides a foundation to characterize the general hydrostratigraphy of the lands within the Study Area. Hydrostratigraphy is the classification of various major stratigraphic units into aquifers and aquitards, with some simplification or combination of units with similar properties. An aquifer is classically defined as a geological unit that is sufficiently permeable to permit the extraction of a useable supply of water. Aquifer units within the Study Area are typically comprised of coarse-textured unconsolidated (overburden) sediments or shale and siltstone bedrock. Surficial coarse-textured overburden sediments within the Study Area are limited to local glaciofluvial/glaciolacustrine and alluvial deposits.

4.2.4 Groundwater Resources

An inventory of local private water wells (i.e., domestic, commercial, industrial, etc.) was performed within the Study Area by means of searching the MOECC Water Well Record database. A total of 472 water well records were found located within the Study Area. A review of the water well records indicates that the majority of wells extend to a depth less than 10 m and are used for the purpose of monitoring or test boreholes.

As shown in **Table 4-8**, available well records indicate that 54% of groundwater use in Study Area is for monitoring and/or dewatering purposes, followed by domestic use (<1%), and industrial / commercial use (<1%). The two (2) domestic water well records are decommissioning records for remnant groundwater supply wells and no longer exist within the Study Area. Approximately 39% of MOECC water well records did not specify the well use and therefore are classified as 'Unknown'. Approximately, 6% of the MOECC water well records indicate the well is not used, accounting for decommissioning records and dry wells.

Table 4-8: Summary of MOECC Water Well Record Information

Primary Water Use	Number of Well Records	Range of Well Depth (m)	Primary Well Type
Commercial/Industrial	2	14.6	1 Overburden, 0 bedrock, 1 Unknown
Domestic	2	8.0	1 Overburden, 0 bedrock, 1 Unknown
Monitoring/Test Hole/Dewatering	256	1.4 m to 54 m	256 Unknown
Not Used	29	3.1 m to 35.0 m	13 overburden, 3 bedrock, 13 Unknown
Unknown	183	4.2 m to 35 m	7 Overburden, 0 Bedrock, 176 Unknown

Most properties that indicated groundwater use based on MOECC Water Well Record information have been re-developed with residential subdivisions, high density residential buildings and/or commercial land use that is subsequent to the construction date of the suspected well. It should be noted that location inaccuracies of recorded water well supplies exist within the MOECC Water Well Information System from which the water well record information was obtained.

4.2.5 Depth to Groundwater Table

Given the relatively low number of MOECC water well records within the Study Area that provided static water levels, some difficulty was presented in characterizing the depth to the water table. Only four (4) MOECC well records were identified that report a static water level. The static water levels within these wells records range between about 1.3 m and 12.2 mBGS. Static water levels may fluctuate considerably in response to changes in precipitation patterns and seasonal fluctuations.

4.3 Air Quality

An Air Quality Baseline Conditions Report has been completed to establish baseline air quality conditions for six GO Transit rail corridors including the Lakeshore East Rail Corridor. This was completed in support of Electrification; however, the existing conditions information contained in the report provides details relevant to the Lakeshore East Rail Corridor Expansion from Don River to Scarborough GO Station. A copy of the Air Quality Baseline Conditions Report is provided in **Appendix B2a**. It is important to note that Electrification is subject to a separate standalone environmental assessment following the TPAP.

4.3.1 Methods

The approach involved an assessment of general background air quality in the study area. **Figure 4-3** shows the study area relevant to the Lakeshore East Rail Corridor Expansion from Don River to Scarborough GO Station.

Figure 4-3: Air Quality Baseline Conditions Study Area

The contaminants of interest are those associated with the currently operating diesel locomotives. The by-products of diesel combustion include inorganic gases, airborne particles, organic gases, particulate matter (PM), various trace metals found within the PM, and a class of organic compounds that is mainly associated with the PM (polycyclic aromatic hydrocarbons or PAH's). A selection of contaminants of greatest concern was reviewed in more detail. Specifically, the contaminants studied included:

- carbon monoxide;
- nitrogen dioxide;
- particulate matter less than 2.5 µm in diameter (PM_{2.5});
- particulate matter less than 10 µm in diameter (PM₁₀);
- formaldehyde;
- acetaldehyde;
- benzene;
- 1,3-butadiene; and
- benzo(a)pyrene.

Acrolein has previously also been identified as a contaminant of concern in similar transportation studies, however ambient monitored concentrations of acrolein are very limited. Ambient monitoring of acrolein occurred at only one station within the study area, and this station became inactive in 2006. As these data are very limited and may no longer be representative of the air quality in the vicinity of the rail corridors, it was excluded from further analysis.

The Province of Ontario has established criteria for concentrations of airborne contaminants. The Ambient Air Quality Criteria (AAQC's) are effects-based levels in air, based on health and/or other effects. They are used in environmental assessments, special air monitoring studies, and assessments of general air quality to determine the potential for adverse effects. In addition to provincial AAQC's, the Federal Government has established Canadian Ambient Air Quality Standards (CAAQS). These are health-based air quality objectives for pollutant concentrations in outdoor air. These objectives are being phased in, with the final and most stringent objective becoming active in the year 2020. Since these assessments also concern future concentrations, they typically use the most stringent 2020 CAAQSs as the relevant objectives, as is the case here. For this study, the CAAQS only applies to PM_{2.5} for which there is no AAQC. These criteria are summarized in **Table 4-9** below.

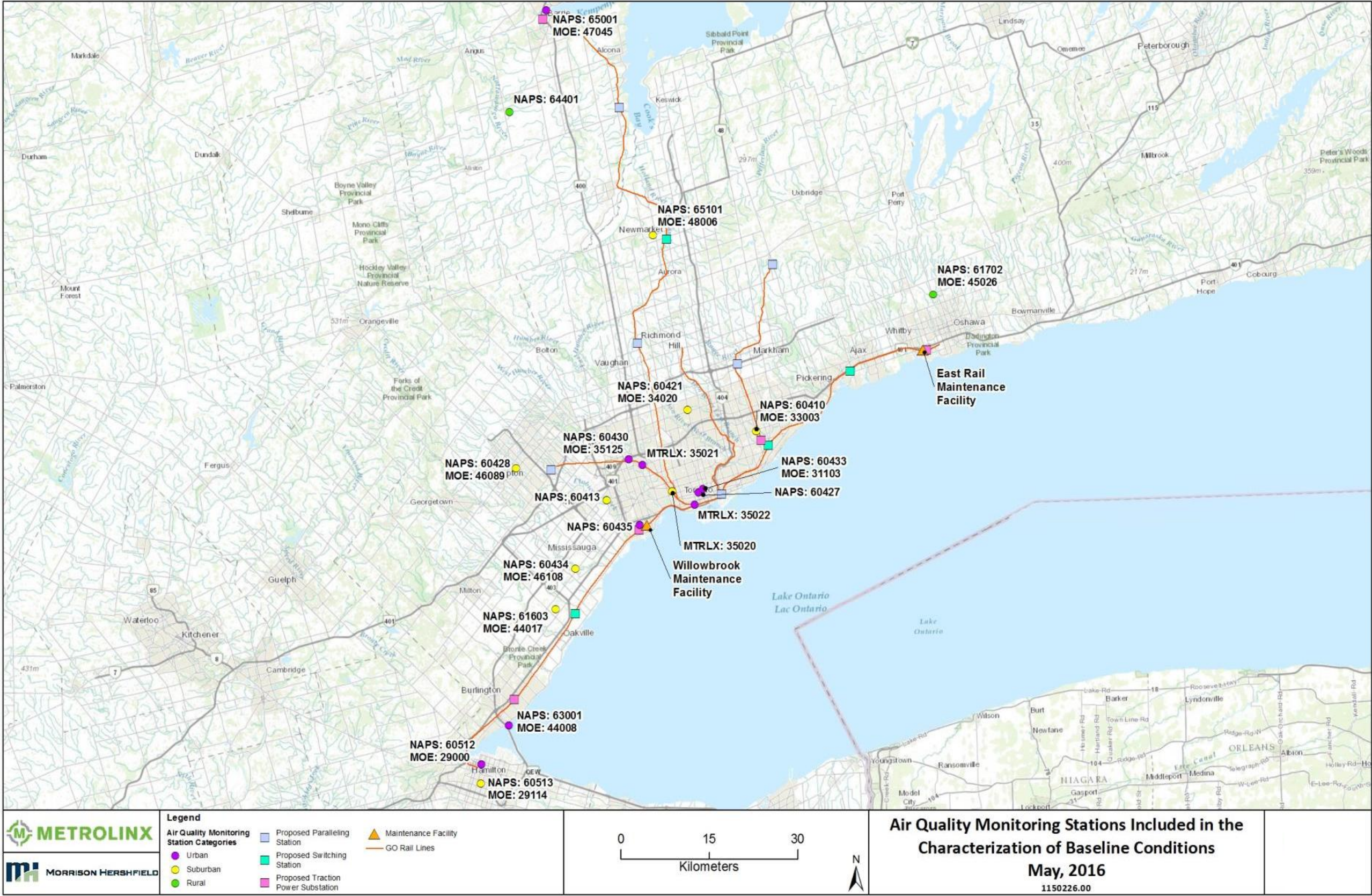
Table 4-9: Summary of Air Quality Criteria

Contaminant	Criterion ($\mu\text{g}/\text{m}^3$)			
	1-hr	24-hr	Annual	Other
Carbon Monoxide	36200	-	-	15700 (8-hr)
Nitrogen Dioxide	400	200	-	
PM _{2.5}	-	27	8.8	
PM ₁₀	-	50	-	
Formaldehyde	-	65	-	
Acetaldehyde	-	500	-	500 (1/2-hr)
Benzene	-	2.3	0.45	
1,3-Budadiene	-	10	2	
Benzo(a)Pyrene	-	0.00005	0.00001	

Greenhouse gases are also of concern as they relate to climate change. Greenhouse gas emissions are considered as part of the impact assessment in **Section 5.3**.

The concentrations of these contaminants in the vicinity of the rail corridors can be established through ambient monitoring or from computer models. Several ambient monitoring stations are already in place within the study area, and being operated by the MOECC, Metrolinx and under the National Air Pollution Surveillance program (NAPS). These stations have the advantage of providing actual concentration measurements rather than model predictions; however, monitoring can only be done at a limited number of locations. **Figure 4-4** shows the location of air quality monitoring stations included in the characterization of baseline conditions.

Figure 4-4: Air Quality Monitoring Stations Included in the Characterization of Baseline Conditions



4.3.2 Existing Conditions

To characterize baseline conditions, monitoring stations were identified as belonging to one of three land use categories: Urban, Suburban or Rural. The Lakeshore East Rail Corridor Expansion from Don River to Scarborough GO Station was identified as falling within the Suburban category – a land use category where baseline air quality is influenced by surrounding neighbourhoods but not from major emission sources and highways. **Table 4-10**, which is also found in Appendix A of the Air Quality Baseline Conditions Report (**EPR Appendix B2a**), shows the air quality statistics for the Suburban land use category, which represents an average of the data from the stations labelled as suburban in **Figure 4-4**.

Table 4-10: Summary of Suburban Baseline Air Quality Conditions

Contaminant	Criterion ($\mu\text{g}/\text{m}^3$)				Baseline Conditions								
					Percentile Concentrations				Percentile Averaging Period	Annual Mean ($\mu\text{g}/\text{m}^3$)	Maximum Concentration ($\mu\text{g}/\text{m}^3$)		
	1-hr	24-hr	Annual	Other	50th	70th	90th	99th			1-hr	24-hr	8-hr
Carbon Monoxide	36200	-	-	15700 (8-hr)	205	255	362	757	1-hr	229	2437	N/A	1509
Nitrogen Dioxide	400	200	-	-	18	27	47	80	1-hr	23	121	71	N/A
PM _{2.5}	-	27	8.8	-	5	8	14	28	1-hr	6.7	62	29	N/A
PM ₁₀	-	50	-	-	N/A	N/A	N/A	N/A	24-hr	N/A	N/A	N/A	N/A
Formaldehyde	-	65	-	-	N/A	N/A	N/A	N/A	24-hr	N/A	N/A	N/A	N/A
Acetaldehyde	-	500	-	500 (½-hr)	N/A	N/A	N/A	N/A	24-hr	N/A	N/A	N/A	N/A
Benzene	-	2.3	0.45	-	0.46	0.58	0.80	1.14	24-hr	0.57	N/A	1.77	N/A
1,3-Butadiene	-	10	2	-	0.03	0.05	0.07	0.12	24-hr	0.04	N/A	0.13	N/A
Benzo(a)Pyrene	-	0.00005	0.00001	-	N/A	N/A	N/A	N/A	24-hr	0.00018	N/A	0.0036	N/A

Within the Suburban land use category most contaminants remain well within the applicable criteria and somewhat lower than those in urban areas. However, annual average benzene and benzo(a)pyrene concentrations still exceed their criteria. Criterion for 24 hour concentration of PM_{2.5} is slightly exceeded. Data on PM₁₀ were unavailable for the Suburban land use category.

4.4 Noise and Vibration

A Noise and Vibration Modelling Report has been completed to predict existing and future noise and vibration levels for six GO Transit rail corridors including the Lakeshore East Rail Corridor and to assess potential impacts in accordance with the applicable guidelines. This was completed in support of Electrification; however, the existing conditions information contained in the report provides details relevant to the Lakeshore East Rail Corridor Expansion from Don River to Scarborough GO Station. A copy of the Noise and Vibration Modelling Report is provided in **Appendix B3**. It is important to note that Electrification is subject to a separate standalone environmental assessment following the TPAP.

4.4.1 Methods

Modelling was completed using the “Federal Noise and Vibration Impact Assessment” (FTA Protocol) (FTA, 2006) incorporated in Cadna/A. This approach to modelling was discussed with MOECC. Please refer to **Appendix B3** for additional information regarding the FTA prediction method.

4.4.1.1 Receptors

Receptors for this assessment include 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.

Receptors within the study area are mainly residential houses located adjacent to the 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. Preliminary modelling was completed for all these receptors; however, results are presented for selected representative receptors.

Residences have different setback distances and various degrees of visual screening from the railway corridor. Residences closest to the track (i.e., typically those adjacent to the right-of-way of the railway line) are anticipated to have the greatest Adjusted Noise Impact. At increasing distances from the corridor, the change in sound exposure levels due to a change in rail traffic or track location becomes less significant. Moreover, as the separation distance increases between the railway line and receptors, the sound environment becomes predominantly background sound unrelated to activities on the railway line. In practice, this means that sound levels are not evaluated at receptors beyond those nearest to the rail corridor.

The MOECC, formerly Ministry of the Environment and Energy (MOEE) and GO Transit developed a “Draft Protocol for Noise and Vibration Assessment” in December 1994 (MOEE/GO Draft Protocol) (MOEE, 1994). This document has been used as the primary guideline document for assessment of the rail noise and vibration levels.

The MOEE/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. Nighttime receptors are to be placed at the plane of the bedroom window that is most exposed to the noise source. In the present case, the residences are mainly located in an urban area where front and backyards have small surface areas. For simplicity, therefore, the daytime and nighttime receptors were collocated at a single horizontal position, at the most exposed façade of the dwelling.

The receptor height, however, differed between daytime and nighttime. Daytime sound levels were assessed at a height of 1.5 m above local grade. Nighttime sound levels were assessed at the bedroom window height, assumed to be 4.5 m above ground (i.e., the second storey bedroom window).

4.4.1.2 Noise

In keeping with the MOEE/GO Draft Protocol, the ambient sound level is defined as the sound existing at a receptor in the absence of the rail activity. At the nearest receptors along the rail corridor, the ambient noise was assumed to be significantly lower than the noise from existing rail activity and was therefore not assessed. 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 is taken as 55 dBA L_{EQ} (16-hr) daytime or 50 dBA L_{EQ} (8-hr) nighttime. Daytime is between 0700h and 2300h and nighttime is between 2300h and 0700h.

Existing noise barriers were defined as barriers built as of January 2016 or planned barriers identified during Environmental Assessments completed prior to January 2016.

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 this exercise.

Planned noise barriers were identified in information provided by Metrolinx (i.e., previously completed Environmental Assessments). 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 RER service.

4.4.1.3 Vibration

Vibration effects have been predicted in accordance with the methods of the United States Department of Transportation - Federal Transit Administration (FTA, 2006). Vibration levels are expressed in terms of root-mean-square (RMS) velocity in the vertical direction, which is the dominant axis for vibration generated from mobile sources such as trains and most closely correlated with human annoyance and perceptibility.

Receptors R021B, R023B, R037B and R043, near proposed new switches, and receptors R013, R027, and R031, near proposed new track, were the closest receptors to a change in the track configuration that could affect vibration levels; therefore, the vibration assessment focused on these seven receptors. Vibration levels decrease with increased distance from the source; therefore, other receptors at greater distance from the source are expected to show lower vibration levels.

4.4.2 Existing Conditions

4.4.2.1 Existing Service Rail Traffic

Table 4-11 outlines the existing rail service traffic modelled. All existing trains operate using diesel.

Table 4-11: Existing Rail Service Traffic (Diesel)

Train Type	Number of Trains	
	Daytime	Nighttime
Eastbound Regular GO Train (Revenue)	31	4
Eastbound Express GO Train (Revenue)	7	0
Eastbound GO Train (Non-Revenue)	0	6
Eastbound VIA Trains (Revenue)	18	0
Westbound Regular GO Train (Revenue)	31	6
Westbound Express GO Train (Revenue)	8	1
Westbound GO Train (Non-Revenue)	1	1
Westbound VIA Trains (Revenue)	16	1
Stouffville GO Trains (Revenue and Non-Revenue)	17	1
CN Freight Switchers ²	2	0

4.4.2.2 Receptors

The representative receptors evaluated within the study area are shown in **Figures 4-5A to 4-5C** and summarized in Table 1 of **Appendix B3**.

2. CN Freight Switchers include 1 freight train travelling eastbound on the Kingston Subdivision and 1 freight train travelling southbound on the Uxbridge Subdivision.

4.4.2.3 Noise

The location of existing noise barriers within the study area is shown in **Figures 4-5A to 4-5C**. Existing noise barriers are considered barriers built as of January 2016 or planned barriers identified during Environmental Assessments completed prior to January 2016.

The predicted daytime existing noise levels range from 49.0 dBA to 69.0 dBA and predicted nighttime existing noise levels range from 46.9 dBA to 64.0 dBA. The predicted existing noise levels by receptor are listed in Tables 3a and 3b of **Appendix B3**.

4.4.2.4 Vibration

The predicted existing vibration levels by selected receptors are listed in Table 5-5. The predicted existing vibration levels vary by speed over the track and distance to rail components.

4.5 Socio-Economic and Land Use

The existing land use and planning policy context of the Study Area and Socio-economic Assessment Area is documented in greater detail in the Socio-Economic and Land Use Impact Assessment Report provided in **Appendix B4**. A summary is provided below.

4.5.1 Methods

A desktop review of the Socio-economic Assessment Area (Study Area plus a 300 m buffer offset of the existing Lakeshore East Rail Corridor) was conducted using municipal planning documents and open data sources to identify significant socio-economic and land use features, including established neighbourhoods, residential uses, commercial areas, institutional uses, employment lands, recreational uses and parks and open spaces. The City of Toronto Open Data Catalogue was used to obtain geographic information system (GIS) data used in **Figures 4-6A to 4-6D**.

4.5.2 Planning Context

The Socio-economic Assessment Area is located within the City of Toronto, specifically within Ward 28 (Toronto Centre-Rosedale), Ward 30 (Toronto-Danforth), Ward 32 (Beaches-East York), Ward 35 (Scarborough Southwest), and Ward 36 (Scarborough Southwest). The City of Toronto Official Plan was reviewed to gather local land use policy context for the Study Area.

4.5.2.1 City of Toronto Official Plan (June, 2015)

The majority of the land use within the Socio-economic Assessment Area is designated as 'Neighbourhoods' in the Official Plan. This designation permits a full range of residential uses within lower scale buildings, as well as parks, schools, local institutions and small-scale stores and shops that serve local needs.

The 'Parks' and 'Natural Areas' designations also comprise a significant portion of the Socio-economic Assessment Area and are dispersed throughout. These designations are both sub-categories of the 'Natural Areas, Parks, and Other Open Space Areas' designation. The 'Parks' designation permits municipal parks and recreation trails, while the 'Natural Areas' designation is reserved for lands that are to be kept primarily in a natural state while also allowing for compatible recreational, cultural and educational uses and facilities that minimize adverse impacts on natural features and functions.

Figure 4-5A: Receptor and Existing Barrier Locations

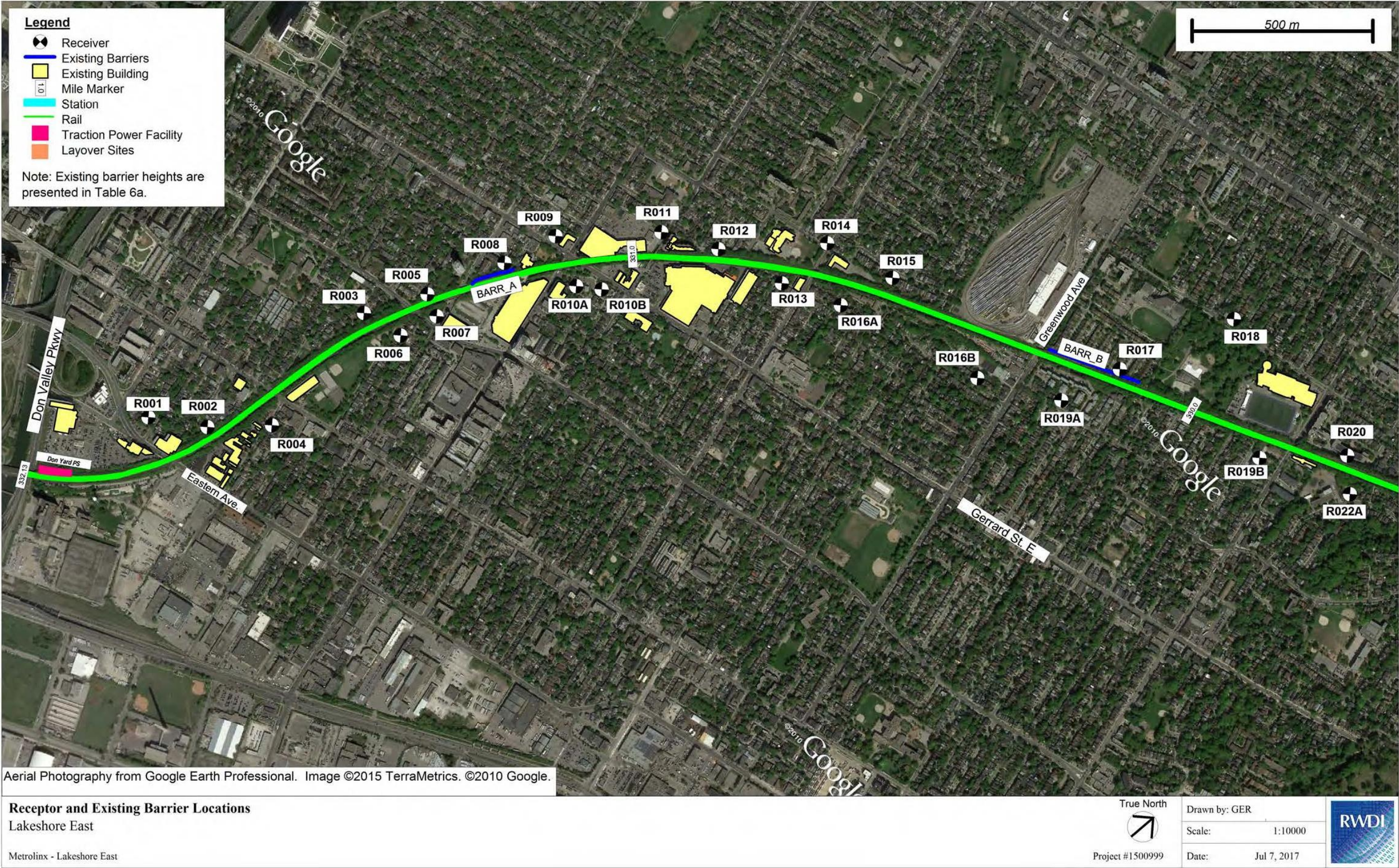
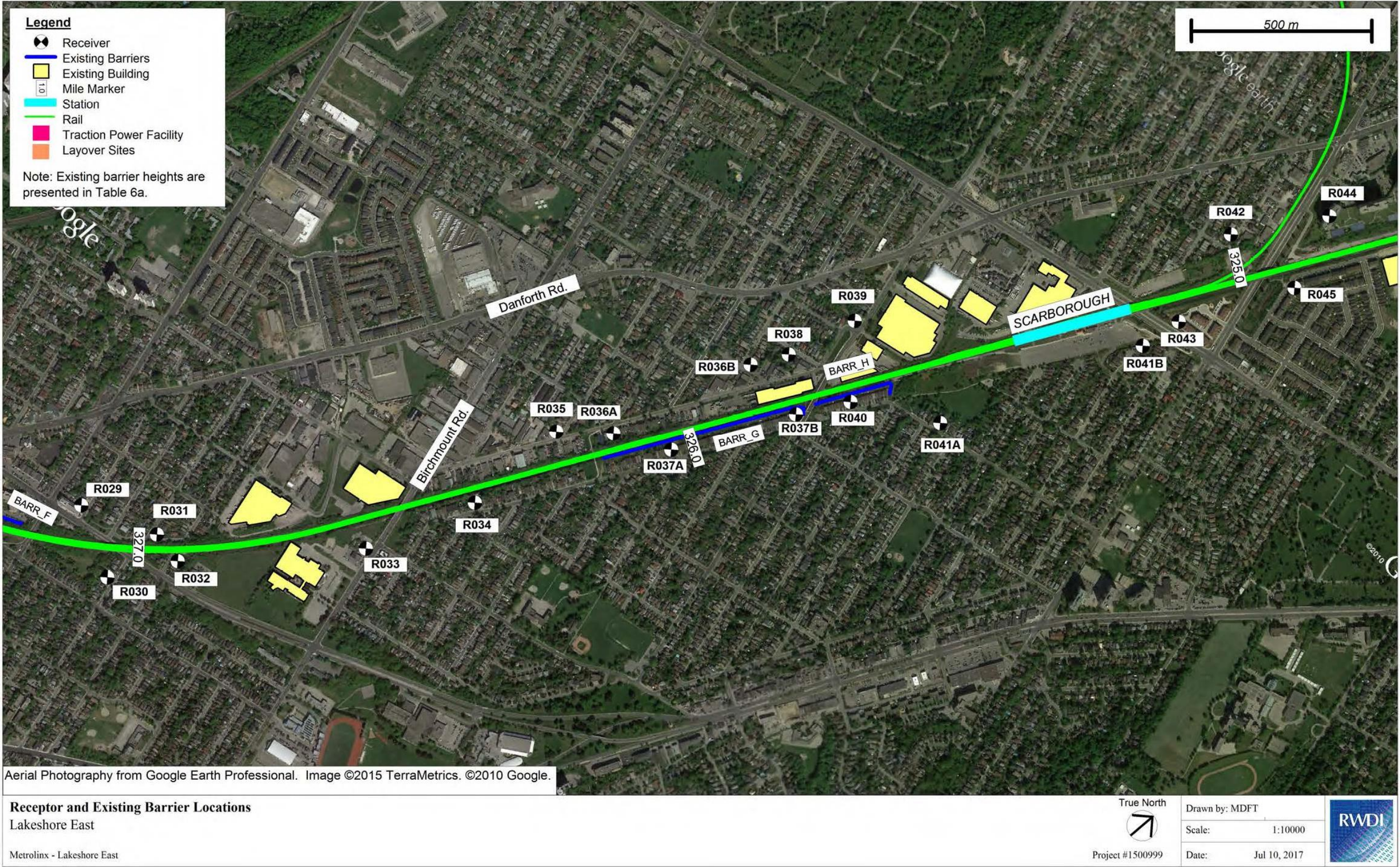
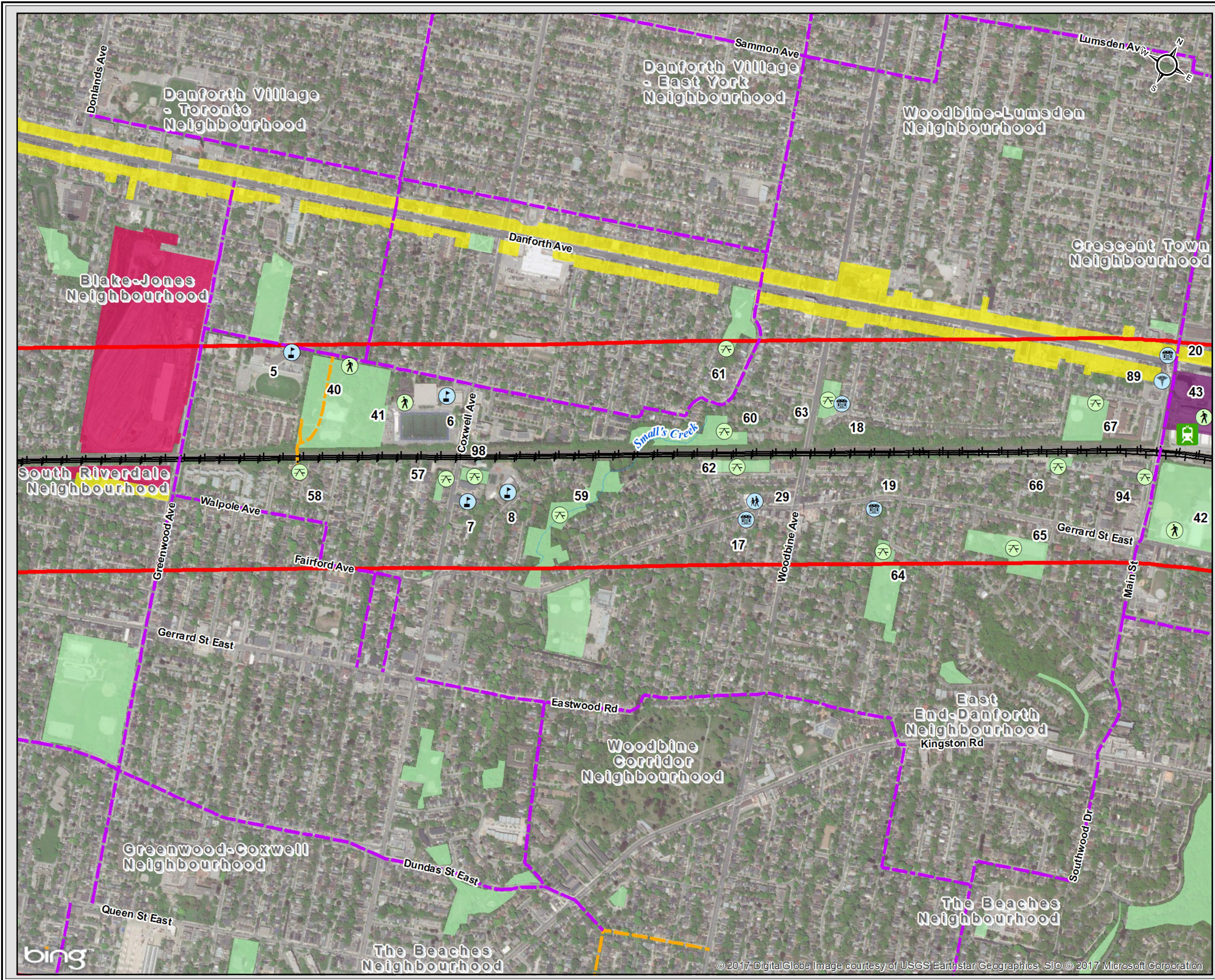


Figure 4-5B: Receptor and Existing Barrier Locations



Figure 4-5C: Receptor and Existing Barrier Locations





Legend

- Retirement Institution
- Educational Institution
- Religious Institution
- Medical Institution
- Other Institution
- Open Space
- Park
- Recreational Area
- GO Stations
- Watercourse
- Ontario Railway Network
- Multi-use Pathways
- Cycling Facilities
- High-Density Mixed Use Residential
- Main Commercial Areas
- Main Employment Areas
- Green Space/Park
- Assessment Area (300 m buffer)

0 50 100 200 300 400
m
1:10,000
MTM 3Degree, NAD 27

Contains information licensed under the Open Government Licence – Toronto, and Open Government Licence – Canadas. Bing Maps Aerial - © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2014 Microsoft Corporation
This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Lakeshore East Rail Corridor Expansion
(Don River to Scarborough GO Station) Project
Environmental Project Report

Existing Socio-Economic Conditions: Greenwood Avenue to Danforth GO Station

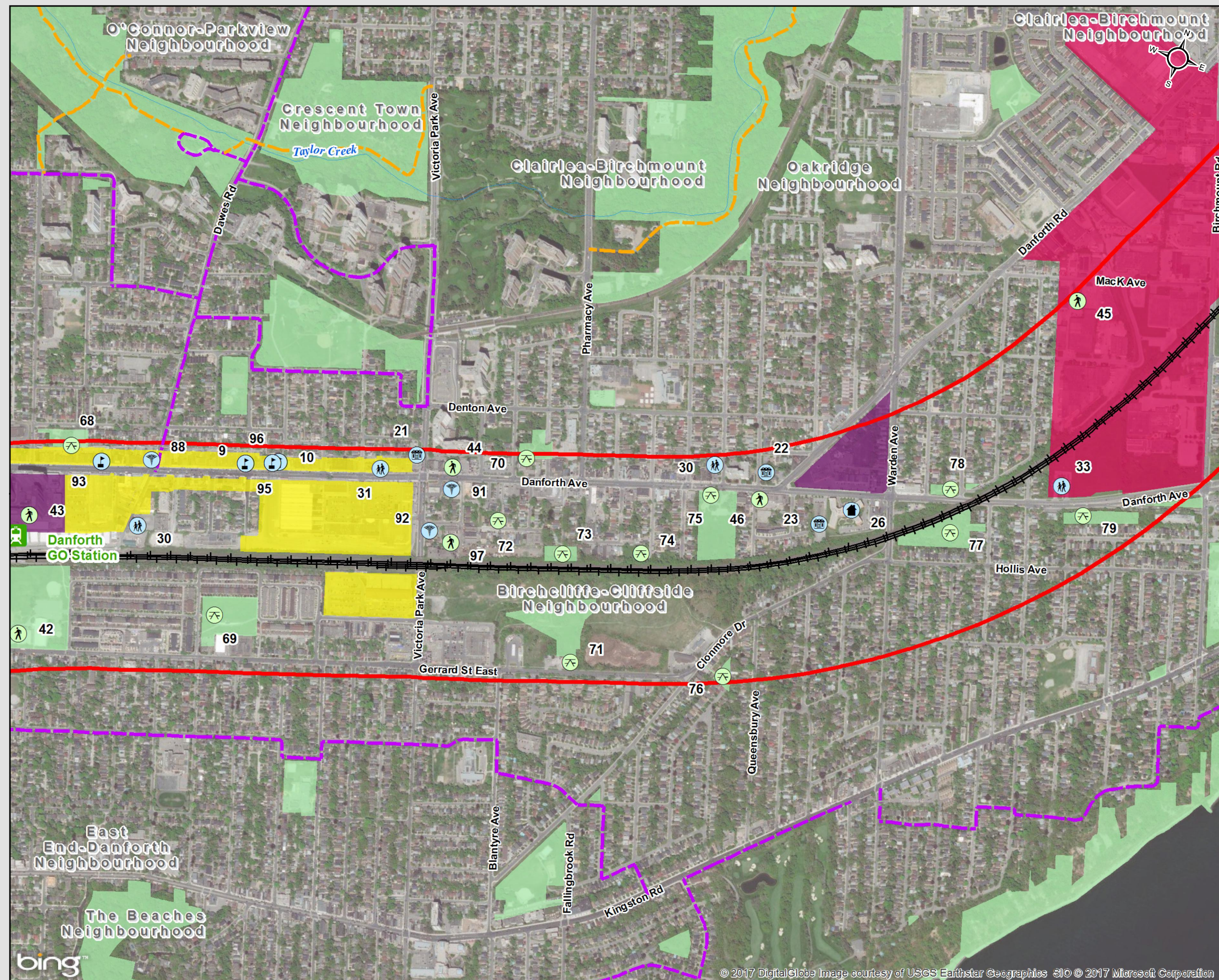
April 2017

AECOM

Figure 4-6B

Map Document: (N:\Temporary\Local\Project\Master\MLX\Lakeshore East\MXD\NEPR_Figures_2016\03\0315654_Existing_SocioEconomic_Conditions_Seg1_EPR.mxd)
4/20/2017 8:37:24 AM

Map Document: (N:\Temporary\Local\Project\Master\MLX\Lakeshore East\MXD\IEPR_Figures_2016\03\0315654_Existing_SocioEconomic_Conditions_Seg1_EPR.mxd)
4/20/2017 8:37:24 AM



- Legend**
- Retirement Institution
 - Educational Institution
 - Religious Institution
 - Medical Institution
 - Other Institution
 - Open Space
 - Park
 - Recreational Area
 - GO Stations
 - Watercourse
 - Ontario Railway Network
 - Multi-use Pathways
 - Cycling Facilities
 - High-Density Mixed Use Residential
 - Main Commercial Areas
 - Main Employment Areas
 - Green Space/Park
 - Assessment Area (300 m buffer)

0 50 100 200 300 400
m
1:10,000
MTM 3Degree, NAD 27

Contains information licensed under the Open Government Licence – Toronto, and Open Government Licence – Canadas. Bing Maps Aerial - © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2014 Microsoft Corporation
This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Lakeshore East Rail Corridor Expansion
(Don River to Scarborough GO Station) Project
Environmental Project Report

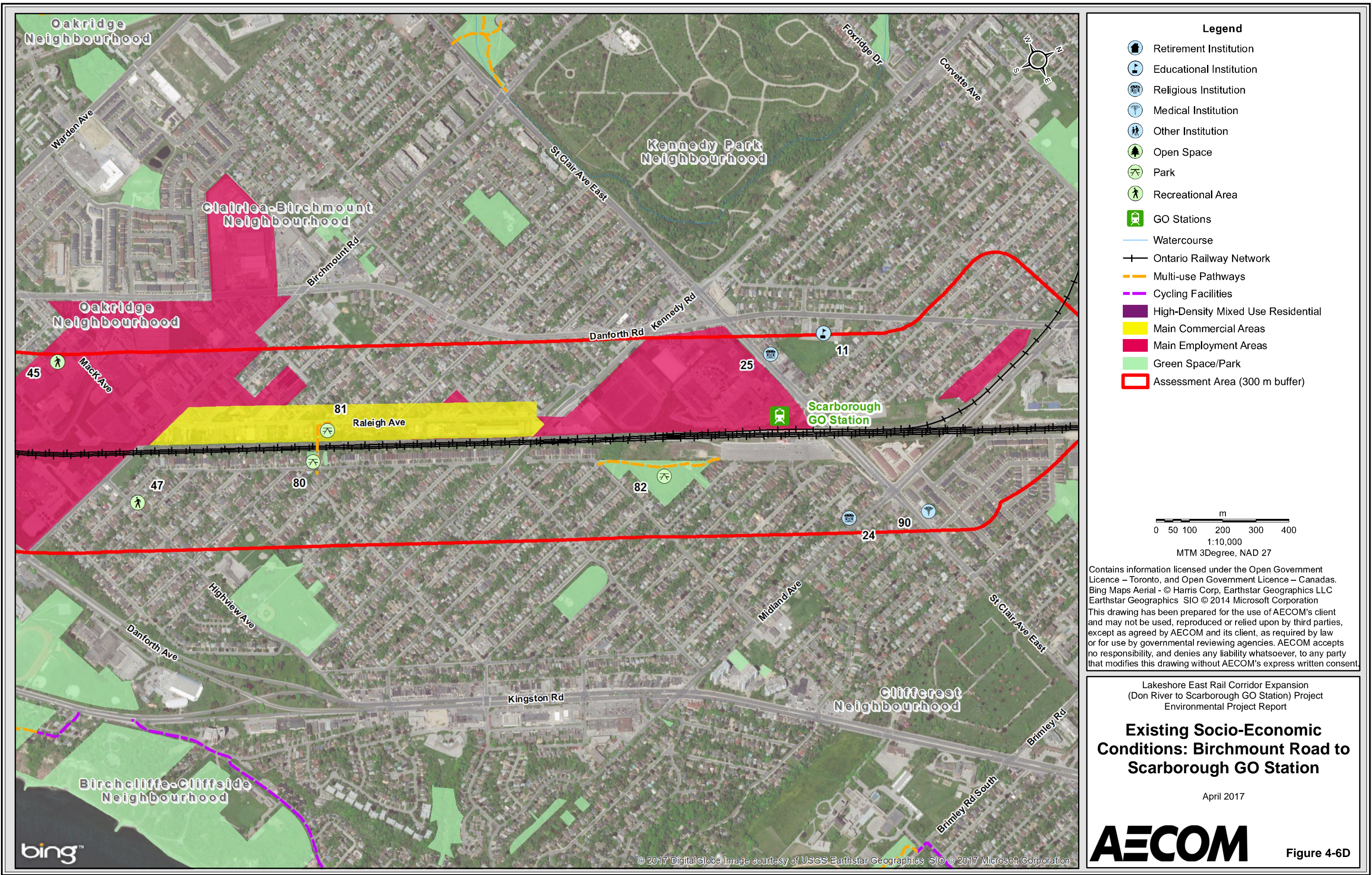
**Existing Socio-Economic
Conditions: Danforth GO
Station to Birchmount Road**

April 2017

AECOM

Figure 4-6C

Map Document: (N:\Temporary\Local\Project\Master\MLX\Lakeshore East\MXD\IEPR_Figures_2016\030315654_Existing_SocioEconomic_Conditions_Seg1_EPR.mxd)
4/20/2017 8:37:24 AM



The Official Plan defines ‘Employment Areas’ as places of business and economic activity, including offices, manufacturing, warehousing, distribution, research and development facilities, utilities, media facilities, parks, hotels, retail outlets ancillary to the preceding uses, as well as restaurants and small scale stores and services that serve businesses and workers. Lands designated as ‘Employment Areas’ within the Socio-economic Assessment Area include:

- The South of Eastern Employment District, which is bounded by the Don Valley Parkway to the west, Coxwell Avenue to the east, Eastern Avenue to the north and Lake Shore Boulevard to the south;
- The Danforth Road / CNR Employment Cluster, which roughly extends from west of Birchmount Road to east of Brimley Road; and
- The Toronto Transit Commission (TTC) Greenwood Yard, which is located north of the Lakeshore East Rail Corridor and west of Greenwood Avenue.

These employment areas are described in more detail in **Section 4.5.3.5**.

A significant portion of land located near Danforth GO Station between Main Street and Warden Avenue is designated as ‘Mixed Use Areas,’ which describes a broad range of commercial, residential, and institutional uses, in single use or mixed use buildings. The use of this designation achieves City planning objectives by combining a broad variety of residential uses, offices, retail and services, institutions, entertainment, recreation and cultural activities, and parks and open spaces.

The Lakeshore East Rail Corridor crossing at the Don River includes lands that are subject to the City of Toronto Ravine and Natural Feature Protection By-law, adopted by Council in 2008 and found in Chapter 658 of the Toronto Municipal Code. The by-law promotes the management, protection and conservation of ravines and associated natural and woodland areas and prohibits or regulates the injury/removal of trees, filing, grading, and dumping in areas defined within the by-law. In 2013, the Ontario government announced the expansion of the Greenbelt, meaning that municipalities can now connect their urban waterways to the Greenbelt through the new Urban River Valley Designation. The City of Toronto is considering adding the Don River as part of this new initiative. The Don River is 38 km long and originates from the Oak Ridges Moraine. It is central to Toronto’s history and there are initiatives underway to revive the river after more than 100 years of industrial and development stressors. Adding the Don River to the Greenbelt ensures both natural recognition and future protection of the river.

A small portion of lands within the Socio-economic Assessment Area and adjacent to the Don River is also designated as a ‘Special Policy Area’ (Lower Don: Don River). This Special Policy Area functions as a form of flood protection and allows new development to occur only after appropriate flood proofing measures have been approved and incorporated into the design. The First Gulf (Unilever) redevelopment site, Broadview Light Rail Transit (LRT) Extension, and the new Gardiner Expressway Realignment are projects that will have a large impact on this area. These projects will aim to improve the public realm and will contribute to new employment lands and development opportunities.

4.5.3 Existing Land Use

Key existing land uses, including neighbourhoods, residential, commercial, institutional, employment, recreation and parks and open spaces uses are documented in **Figures 4-6A to 4-6D**.

4.5.3.1 Neighbourhoods

The following is a list of established neighbourhoods that are present within or in close proximity to the Socio-economic Assessment Area as identified by City of Toronto Neighbourhood Profiles:

- South Riverdale;
- Blake-Jones;
- Greenwood-Coxwell;
- Woodbine Corridor;
- East End-Danforth;
- Birchcliffe-Cliffside;
- Oakridge;
- Birchmount Park;
- Kennedy Park; and,
- Cliffcrest.

A mural was completed in 2013 on the Warden Avenue bridge underpass, celebrating the history of Scarborough and the two (2) neighbourhoods joined by the underpass (Birch Cliff and Oakridge). There is also a mural on road facing components of the Woodbine Avenue Bridge.

4.5.3.2 Residential

The Socio-economic Assessment Area is comprised of a mix of housing including mainly low- and medium-density residential housing with some higher-density residential housing. There is an abundance of row housing and townhomes in the western portion of the Socio-economic Assessment Area, with lower-density detached and semi-detached housing becoming more prevalent to the east.

There are also clusters of higher-density residential housing in the form of condominium and apartment buildings throughout the Study Area.

Multiple development applications were identified throughout the Socio-economic Assessment Area proposing residential units with a significant number of new higher-density residential units.

4.5.3.3 Commercial

Commercial uses are dispersed throughout the Socio-economic Assessment Area and consist of large-scale shopping centres, as well as small-scale retail uses that serve the surrounding neighbourhood within the Socio-economic Assessment Area.

The following main commercial areas are found within the Socio-economic Assessment Area:

- Northwest corner of Gerrard Street East and Marjory Avenue intersection (**Figure 4-6A**);
- North side of Wagstaff Drive at Greenwood Avenue intersection (**Figure 4-6A**);
- Northwest of Victoria Park Avenue and Musgrave Street intersection (**Figure 4-6C**);
- North and south sides of Danforth Avenue east of Victoria Park Avenue (**Figures 4-6B** and **4-6C**); and,
- North and south sides of Raleigh Avenue between Birchmount Road and Kennedy Road (**Figure 4-6D**).

4.5.3.4 Institutional

The following institutional uses were identified within the Socio-economic Assessment Area:

- Sixteen (16) educational institutions dispersed throughout the Socio-economic Assessment Area, including elementary schools, secondary schools, and pre-schools;
- Fourteen (14) religious places of worship identified within the Socio-economic Assessment Area, including various Christian churches, an Islamic mosque, a Sikh temple, and Siecho-no-le (New Thought Japanese) institution; and
- Six (6) medical institutions, including a medical laboratory, family practice and walk-in clinic, and animal hospitals.

West of Warden Avenue on the north side of the Lakeshore East Rail Corridor is Chester Village Long-Term Care Facility, the only facility of this kind within the Socio-economic Assessment Area.

Further details regarding the existing institutional uses in the Socio-economic Assessment Area are provided in **Appendix B4**.

4.5.3.5 Employment

As mentioned in **Section 4.5.2.1**, there are three (3) main designated employment areas within the Socio-economic Assessment Area.

The first of these areas is the South of Eastern Employment District, which is bounded by the Don Valley Parkway to the west, Coxwell Avenue to the east, Eastern Avenue to the north and Lakeshore Avenue to the south. Current employment uses in this area include City Works, Cinespace Studios, a BMW dealership, Revival Studio, a Canada Post Facility, supermarkets, and manufacturing and warehousing businesses.

The second main designated employment area within the Socio-economic Assessment Area is the Danforth Road / CNR Employment cluster, which roughly extends from west of Birchmount Road to east of Brimley Road. Current employment uses within the area are primarily related to manufacturing and warehousing.

The final main designated employment area within the Socio-economic Assessment Area is the TTC Greenwood Yard, which is located north of the Lakeshore East Rail Corridor and west of Greenwood Avenue. The Greenwood Yard serves as both a rail yard for all of the Bloor-Danforth line's subway vehicles and a maintenance facility where repairs to subway vehicles are carried out.

4.5.3.6 Recreational

There are a number of performing arts facilities within the Socio-economic Assessment Area. Notably, the Theatre Museum Canada, located at the western limit of the Study Area, is the only museum devoted to celebrating the performing arts heritage of Canada. The Young Centre for the Performing Arts is a theatre, music and arts venue located in Toronto's Distillery District. The Opera House is a popular live music venue located on Queen Street East just east of Broadview Avenue.

Located within the Socio-economic Assessment Area are portions of off-road recreational trails such as Don River Trail, Natal Park Trail, Monarch Stadium Park Trail, and a small portion of Waterfront Trail on Cherry Street.

The following two grade separations are existing pedestrian/cyclist facilities that cross the rail corridor:

- Underpass connecting Monarch Park to the Rail Garden and Woodfield Road; and

- Overpass through Woodrow Park from Raleigh Avenue to Aylesworth Avenue.

4.5.3.7 Parks and Open Spaces

There is a range of parks and open spaces within the Socio-economic Assessment Area, including neighbourhood parks, parkettes, and recreational parks. A complete list of parks and open spaces within the Socio-economic Assessment Area is provided below:

- | | | |
|------------------------------------|---------------------------------|--------------------------------|
| ▪ Bruce Mackey Park | ▪ Hollis-Kalmar Park | ▪ Raleigh Parkette |
| ▪ Carlaw-Badgerow Parkette | ▪ John Chang Neighbourhood Park | ▪ Runnymede Lands |
| ▪ Cassels Avenue Playground | ▪ Kenworthy Park | ▪ Saulter Street Parkette |
| ▪ Coleman Park | ▪ Kildonan Park | ▪ Scotia Parkette |
| ▪ Corktown Common and River Square | ▪ Little York Parkette | ▪ Stephenson Park |
| ▪ Coxwell Avenue Parkette | ▪ Lucy Tot Lot | ▪ The Rail Garden |
| ▪ Degrassi Street Park | ▪ Madelaine Park | ▪ Tiverton Avenue Parkette |
| ▪ Dundas Parkette | ▪ McCleary Playground | ▪ Wildwood Crescent Playground |
| ▪ East Lynn Park | ▪ Merrill Bridge Road Park | ▪ William Hancox Park |
| ▪ Eastdale Playground | ▪ Monarch Park | ▪ Williamson Park Ravine |
| ▪ Elward-Mansion Parkette | ▪ Natal Park | ▪ Woodrow Park |
| ▪ Gerrard Carlaw Parkette | ▪ Norwood Park | |
| ▪ Golf Club Parkette | ▪ Oakcrest Park | |
| | ▪ Oakridge Park | |

4.5.4 Planned Land Use

The following adjacent undertakings in various stages (e.g., early planning, completed, approved) were reviewed to ensure there are no conflicts with the Project:

- City of Toronto SmartTrack/GO Station at future Broadview extension
- City of Toronto Unilever Precinct Planning Study
- City of Toronto/Waterfront Toronto Gardiner Expressway/Lakeshore Boulevard East Reconfiguration
- City of Toronto/Waterfront Toronto Port Lands and South of Eastern Transportation and Servicing Master Plan
- TRCA Don Mouth Naturalization and Port Lands Flood Protection Project

Any areas of project interface are shown in **Appendix A**. Metrolinx will co-ordinate with the City of Toronto and/or the TRCA, as appropriate.

4.6 Traffic and Transportation

A study was completed to document existing traffic volumes and to assess future traffic volumes during and after construction of the Project. The Traffic Impact Study is included in **Appendix B5**.

4.6.1 Traffic Volumes and Operations in Study Area

An existing conditions assessment was completed using the traffic count data shown in Table 3-1 of the Traffic Impact Study (**Appendix B5**) and the AM and PM peak-hour turning movement volumes utilized in the analysis are illustrated in Figures 3-1A to 3-1C and Figure 3-2A to 3-2C of **Appendix B5**.

An intersection operation analysis during the AM and PM peak hours was conducted to show the existing peak-hour traffic operations located at each intersection within the Traffic Impact Study Assessment Area. A detailed table regarding this information is included in **Appendix B5**.

The results of this study showed that in the existing conditions the majority of intersections and the related traffic movements are operating below the critical thresholds with the exception of the following:

- Coxwell Avenue / O'Connor Drive
 - Westbound left/thru-thru/right; volume to capacity ratio³ (v/c ratio) 1.02 (AM peak hour)
- Woodbine Avenue / O'Connor Drive
 - Overall v/c ratio 1.05 (PM peak hour)
 - Eastbound thru-thru; LOS 'E' with v/c ratio 0.90 (AM peak hour)
 - Eastbound right-turn; LOS 'F' with v/c ratio 0.25 (AM peak hour)
 - Northbound left-turn; LOS 'E' with v/c ratios 0.79 and 0.80 (AM & PM peak hour)
- Woodbine Avenue / Kingston Road
 - Eastbound left/thru-thru/right; LOS 'E' with v/c ratio 0.97 (AM peak hour)
 - Westbound left/thru-thru/right; v/c ratio 1.03 (AM peak hour)
 - Northbound right-turn; v/c ratio 1.00 (PM peak hour)
 - Southbound thru-thru/right; LOS 'E' with v/c ratio 0.99 (AM peak hour)
- Victoria Park Avenue / Kingston Road
 - Southbound left/thru/right; LOS 'E' with v/c ratio 0.90 (PM peak hour)
- Kingston Road / St. Clair Avenue
 - Eastbound left-turn; LOS 'E' with v/c ratio 0.91 (PM peak hour)
 - Eastbound left/thru/right; LOS 'F' with v/c ratio 0.98 (PM peak hour)
- Victoria Park Avenue / St. Clair Avenue
 - Eastbound left-turn; LOS 'F' with v/c ratio 0.80 (AM peak hour)
 - Westbound left-turn; LOS 'E' with v/c ratio 0.97 (PM peak hour)
 - Northbound left-turn; LOS 'E' with v/c ratio 0.73 (PM peak hour)
 - Southbound left-turn; LOS 'E' with v/c ratio 0.95 (PM peak hour)
- Warden Avenue / St. Clair Avenue
 - Northbound left-turn; LOS 'E' with v/c ratio 0.80 (PM peak hour)
 - Southbound left-turn; LOS 'E' with v/c ratio 0.96 (PM peak hour)
- Birchmount Road / St. Clair Avenue
 - Westbound left-turn; LOS 'F' with v/c ratio 0.86 (PM peak hour)
 - Northbound left-turn; LOS 'E' with v/c ratio 0.91 (PM peak hour)
- Danforth Road / St. Clair Avenue
 - Eastbound left-turn; LOS 'E' with v/c ratio 0.95 (AM peak hour)
 - Westbound left-turn; LOS 'E' with v/c ratio 0.81 (PM peak hour)
 - Westbound thru-thru/right; LOS 'E' with v/c ratio 0.99 (AM peak hour)
- Danforth Road / Kennedy Road
 - Southbound right-turn; LOS 'F' with v/c ratio 0.12 (AM peak hour)
- Warden Avenue / Clonmore Drive (Hollis Avenue)
 - Eastbound left-turn; LOS 'E' with v/c ratio 0.98 (PM peak hour)
 - Southbound right-turn; LOS 'F' with v/c ratio 0.32 (PM peak hour)
- Kingston Road / Claremore Avenue
 - Northbound left-turn; LOS 'E' with v/c ratio 0.70 (AM peak hour)
- Gerrard Street East / Main Street
 - Northbound left/thru/right; LOS 'E' with v/c ratio 0.94 (AM peak hour)

3. v/c ratios lower than 0.85 are considered good / acceptable. A ratio between 0.85 and 1.00 show that intersection / approach / movement (whichever is applicable) nears capacity and a ratio above 1.00 shows that the intersection / approach / movement operates over theoretical capacity.

- Victoria Park Avenue / Gerrard Street East
 - Northbound left/thru/right; LOS 'E' with v/c ratio 0.95 (AM peak hour)
 - Southbound right-turn; LOS 'F' with v/c ratio 0.20 (PM peak hour)

In addition, results of the study determined that there is currently no cycling infrastructure (e.g., bike lanes, multi-use pathways, cycle tracks, etc.) on / along Woodbine Avenue, Warden Avenue, or Danforth Avenue at and on the approaches to their respective grade-separated rail/road crossings. As the focus of the Traffic Impact Study was on cycling facilities that cross under rail bridges where bridge construction works are anticipated, within the Traffic Impact Study Assessment Area, existing bike lanes were identified at the following intersections:

- Dundas Street / Greenwood Avenue;
- Dundas Street / Jones Avenue;
- Dundas Street / Logan Avenue;
- Coxwell Avenue / Dundas Street East; and
- Coxwell Avenue / Lakeshore East Boulevard East.

Following Council approval in 2016, the City of Toronto plans to implement future bike lanes on Woodbine Avenue from Queen Street to O'Connor with construction scheduled to begin in 2017.

4.6.2 Active Transportation Patterns and Volumes at Danforth GO Station

An active transportation study was completed at Danforth GO Station in order to identify pedestrian and cyclist accessibility locations with the highest potential to be impacted by the construction works. The number of inbound and outbound pedestrians and cyclists to / from Danforth GO Station were counted at the following access points to the station platforms on December 10, 2015⁴ during the 12-hour period between 7:00 AM and 7:00 PM:

1. Ted Reeve Drive;
2. Little York Road;
3. Main Street North; and
4. Main Street South.

The pedestrian and cyclist count showed the vast majority of volume using the Ted Reeve Drive and Main Street North access points for both the AM and PM peak hours. The peak hour volumes are presented in **Table 4-12**.

Table 4-12: Existing Pedestrian Traffic Volumes and Patterns at Danforth GO Station

Access Road	AM Peak			PM Peak		
	Time	Out	In	Time	Out	In
Ted Reeve Drive	8:00 - 9:00	37	157	17:30 - 18:30	109	42
Little York Road	7:45 - 8:45	23	44	16:45 - 17:45	42	21
Main Street North	8:15 - 9:15	103	124	17:30 - 18:30	130	80
Main Street South	8:15 - 9:15	4	12	17:30 - 18:30	9	6

4. While it is not typically ideal to complete pedestrian and cyclist counts in December, Toronto experienced generally mild weather conditions in December 2015. On the day of data collection, temperature was recorded at high of 12 degrees Celsius and with low of 4 degrees Celsius. There was no precipitation (e.g. rain, snow, etc.) and no snow accumulation on the ground. According to Environment Canada, the highest wind speed was recorded that day at 19 km/h. As a result, it is believed that the traffic data collected is suitably representative for the purposes of this assessment.

4.6.3 Public Transit Service

Public transit routes, serviced by Toronto Transit Commission (TTC), that cross the Lakeshore East Rail Corridor within the Traffic Impact Study Assessment Area are listed in **Table 4-13** below.

Table 4-13: TTC Routes Crossing the Lakeshore East Rail Corridor within the Study Area

Route Number	Route Name	Crossing Intersection	Notes
501	Queen Streetcar	Queen Street East and Boulton Avenue	-
301	Queen Streetcar (night)	Queen Street East and Boulton Avenue	-
502	Downtown Streetcar	Queen Street East and Boulton Avenue	-
503	Kingston Road Streetcar	Queen Street East and Boulton Avenue	-
506	Carlton Streetcar	Gerrard Street East and Carlaw Avenue	-
306	Carlton Streetcar (night)	Gerrard Street East and Carlaw Avenue	-
72	Pape Bus	South of Carlaw Avenue and Gerrard Street East	Lakeshore East Rail Corridor crosses via overpass
325	Don Mills Bus (night)	South of Carlaw Avenue and Gerrard Street East	Lakeshore East Rail Corridor crosses via overpass
83	Jones Bus	North of Jones Avenue and Myrtle Avenue	Lakeshore East Rail Corridor crosses via overpass
31	Greenwood Bus	North of Greenwood Avenue and Walpole Avenue	Lakeshore East Rail Corridor crosses via overpass
22	Coxwell Bus	North of Coxwell Avenue and Casci Avenue	Lakeshore East Rail Corridor crosses via overpass
322	Coxwell Bus (night)	North of Coxwell Avenue and Casci Avenue; North of Victoria Park Avenue and Musgrave Street	Lakeshore East Rail Corridor crosses via overpass
92	Woodbine Bus	North of Woodbine Avenue and Darrell Avenue	Lakeshore East Rail Corridor crosses via overpass
64	Main Bus	North of Main Street and Gerrard Street East	Bus running on overpass bridge (above the rail)
12	Kingston Road Bus	North of Victoria Park Avenue and Musgrave Street	Lakeshore East Rail Corridor crosses via overpass
324	Victoria Park Bus (night)	North of Victoria Park Avenue and Musgrave Street	Lakeshore East Rail Corridor crosses via overpass
69	Warden South Bus	North of Warden Avenue and Hollis Avenue; North of Birchmount Road and Highview Avenue	Bus running on overpass bridge (above the rail)
135	Gerrard Bus	North of Warden Avenue and Hollis Avenue	Lakeshore East Rail Corridor crosses via overpass
20	Cliffside Bus	Danforth Avenue and Medford Ave; North of St. Clair Avenue East and Midland Avenue	Lakeshore East Rail Corridor crosses via overpass
9	Bellamy Bus	East of St. Clair Avenue East and Linden Avenue	Lakeshore East Rail Corridor crosses via overpass
102	Markham Road Bus	East of St. Clair Avenue East and Linden Avenue	Lakeshore East Rail Corridor crosses via overpass

4.7 Utilities

Known utilities within the Study Area have been identified based on the Utility Crossing Agreements with Metrolinx. Below is a preliminary list of identified utility owners which will be verified through correspondence with the respective utility owners:

- Power, Cables, Conduits and Lighting
 - Toronto Hydro Electric Commission
 - Hydro one
- Gas and Oil
 - City of Toronto
- Potable Water
 - City of Toronto
- Communications
 - Bell Canada
 - Rogers Cable Communications Inc.
 - Telus Communications Inc.
- Sewers and Drains
 - City of Toronto

The locations of the above-noted utilities will be confirmed during Detailed Design.

4.8 Cultural Environment

4.8.1 Cultural Heritage

4.8.1.1 Methods

A Cultural Heritage Screening Report (CHSR) was conducted to identify properties within the Study Area with recognized or potential cultural heritage value or interest. The properties are identified to determine where further assessment may be required as part of a Cultural Heritage Evaluation Report (CHER). Properties with no potential are screened out of the cultural heritage assessment process. The CHSR is provided in **Appendix B6a**.

A field review of the Study Area was conducted in February 2016 to identify built heritage resources and cultural heritage landscapes of 40 years or older within the study area. For the purposes of this CHSR, the assessment area was defined as properties that share a property boundary with the existing railway corridor and were considered to be potentially impacted.

4.8.1.2 Findings

In total, the CHSR initially identified one (1) Cultural Heritage Landscape and 30 Built Heritage Resources adjacent to the existing Lakeshore East Rail Corridor and are listed below. In addition, the CHSR identified two (2) Heritage Conservation Districts (HCDs): Designated Riverdale HCD and Proposed Queen Street East HCD.

Cultural Heritage Landscapes

- Lakeshore East Rail Corridor

Built Heritage Resources

- | | |
|-----------------------------|---------------------------------------|
| ▪ Don River Bridge | ▪ Jones Avenue Subway |
| ▪ Eastern Avenue Subway | ▪ Greenwood Avenue Subway |
| ▪ 60 and 62 McGee Street | ▪ Woodfield Road Pedestrian Underpass |
| ▪ Queen Street East Subway | ▪ Coxwell Avenue Subway |
| ▪ 6,8 and 10 Paisley Avenue | ▪ Woodbine Avenue Subway |
| ▪ Dundas Street East Subway | ▪ Main Street Overpass |

- | | |
|---|---|
| <ul style="list-style-type: none"> ▪ 7 Tiverton Avenue ▪ 15 and 17 Tiverton Avenue ▪ 17A and 17B Tiverton Avenue ▪ Logan Avenue Subway ▪ 240 First Avenue ▪ 242 First Avenue ▪ Carlaw Avenue Subway ▪ Gerrard Street East Subway ▪ Pape Avenue Pedestrian Overpass | <ul style="list-style-type: none"> ▪ Victoria Park Avenue Subway ▪ Warden Avenue Subway ▪ Danforth Avenue Subway ▪ Birchmount Road Overpass ▪ Woodrow Avenue Pedestrian Overpass ▪ Kennedy Road Overpass ▪ St. Clair Avenue East Subway ▪ Midland Avenue Subway ▪ Danforth GO Station, 213 Main Street |
|---|---|

The CHSR also identified the following five (5) properties previously designated under Part V of the *Ontario Heritage Act*:

- Riverdale HCD;
- 7 Tiverton Avenue;
- 17A and 17B Tiverton Avenue;
- 240 First Avenue; and
- 242 First Avenue.

Of these, the CHSR identified three (3) Conditional Heritage Properties and ten (10) Potential Provincial Heritage Properties adjacent to the Lakeshore East Rail Corridor (summarized in **Table 5-7**). Two (2) of these properties, Carlaw Avenue Subway and Gerrard Street East Subway, are considered to be potentially directly impacted while the remaining eleven (11) properties are considered to be potentially indirectly impacted. To further assess these identified properties, the CHSR recommended a CHER be completed for the thirteen (13) Built Heritage Resources, which are reviewed by the Metrolinx Heritage Committee to determine their cultural heritage value. CHERs for the two (2) potentially directly impacted properties, Carlaw Avenue Subway and Gerrard Street East Subway, have been completed as part of this TPAP and are provided in **Appendix B6b**. CHERs for the remaining eleven (11) potentially indirectly impacted properties will be completed during Detailed Design.

The Lakeshore East Rail Corridor was identified as a Potential Provincial Heritage Landscape and the CHSR recommended the completion of a Cultural Heritage Review Report (CHRR) to document the background and history of the corridor. This CHRR was prepared as a supplementary background report to accompany the Cultural Heritage Evaluation Reports (CHERs) prepared for the Project.

The CHSR did not recommend CHERs for the HCDs as there is substantial existing documentation outlining their heritage value (such as the Riverdale HCD – Phase 1 and the Queen Street East HCD Study); however, a Heritage Impact Assessment (HIA) is recommended for each HCD. An HIA for the two (2) potentially directly impacted properties, Carlaw Avenue Subway and Gerrard Street East Subway, has also been recommended in the CHERs completed for these properties. An HIA to include Carlaw Avenue Subway, Gerrard Street East Subway, the Designated Riverdale HCD and the Proposed Queen Street East HCD will be completed during Detailed Design.

4.8.2 Archaeology

4.8.2.1 Methods

A Stage 1 Archaeological Assessment (AA) was conducted for the Study Area to include the Lakeshore East Rail Corridor with a 300 m buffer from the outside limits of the rail line corridor. The purpose of the Stage 1 AA was to determine whether there is any potential for the Project to impact known, or previously undocumented, archaeological resources within the Study Area. The Stage 1 AA is provided in **Appendix B7**.

The Stage 1 AA was conducted to meet the requirements of the MTCS *Standards and Guidelines for Consultant Archaeologists* (2011). The objective of the Stage 1 AA background study is to document the archaeological and land use history and present conditions within the Project Study Area. This included an analysis of the following sources of information:

- MTCS ASDB for a listing of registered archaeological sites within a 1 km radius of the Study Area;
- Reports of previous archaeological assessments within 50 m of the Study Area;
- Recent and historical maps of the Study Area; and
- Archaeological management plans or other archaeological potential mapping, where available.

In June 2016, Metrolinx received a clearance letter from MTCS confirming its satisfaction that the Stage 1 AA was conducted in accordance with MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* and the terms and conditions for archaeological licences. As such, the Stage 1 AA was entered into the Ontario Public Register of Archaeology Reports.

It should be noted that in the event that Stage 1 and/or Stage 2 AA identifies potential for the discovery of an Indigenous archaeological site, Metrolinx will engage appropriate Indigenous communities to review the findings of the report and seek advice on next steps and monitoring requirements during further stages of archaeological assessment.

4.8.2.2 Known Archaeological Sites

A total of 17 registered archaeological sites are situated within 1 km of the Study Area, as indicated in **Table 4-14** below.

Table 4-14: Known Archaeological Sites within the Study Area

Site Name	Site Type	Cultural Affiliation
O'Sullivan Inn	Homestead	Euro-Canadian
House of Industry	Manufacturing site	Euro-Canadian
Withrow	Ossuary burial	Late Woodland pre-contact
Bell Estate	Homestead	Euro-Canadian
Heinze	N/A	N/A
St. Lawrence Market	Market, Homestead	Euro-Canadian
Berkeley House	Homestead	Euro-Canadian
King-Caroline	Industrial, Residential, Commercial	Euro-Canadian
West Market Square	Hotel	Euro-Canadian
Smith-Barber Site	Factory	Euro-Canadian
Toronto Lime Kiln Works	Homestead	Euro-Canadian
The Gooderham and Worts Windmill Site	Mill	Euro-Canadian
Parliament	Administrative Building	Euro-Canadian
N/A	Homestead	Euro-Canadian
St. James Cathedral	Cemetery	Euro-Canadian
Thornton Blackburn	Homestead, School, Campsite	Euro-Canadian; Late Woodland pre-contact
Leslieville Public School	School, Market	Euro-Canadian

4.8.2.3 Archaeological Potential Analysis

The results of the Stage 1 AA indicate that while much of the lands within the existing study area have been disturbed by past commercial and residential development, as well as railway and road construction, small portions still contain archaeological potential for both historic Euro-Canadian and pre-contact archaeological resources. This is based on the presence of archaeological sites within 1 km of the study area, the early Euro-Canadian settlement

known to have occurred within the Study Area, and the presence of natural environmental features such as watercourses. These areas require a Stage 2 AA consisting of test pitting. These lands are shown in **Figures 4-7A** and **4-7B** below.

Map Document: (\\car1r1p001\\DATA\\P\\Projects\\60315654\\400-Technical\\M02 Environmental Assessment (TPAP)\\GIS\\60315654_Archaeology_Stage1_Fig4_4A.mxd) 2016-11-03 12:02:51 PM



Legend

- GO Stations
- Watercourse
- Stage 1 Study Area
- Stage 1 Results**
- Disturbed
- Potential for Deeply Buried Archaeological Resources. Stage 2 Test Pitting at 5 m Intervals Required
- Test Pitting Required at 5 m Intervals
- Road Type**
- Freeway
- Expressway / Highway
- Major Road
- Local
- Railway

Contains information licensed under the Open Government Licence – Toronto, and Open Government Licence – Canada. Bing Maps Aerial - © 2010 DigitalGlobe Image courtesy of USGS Earthstar Geographics SIO © 2016 Microsoft Corporation © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2016 Microsoft Corporation This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Metrolinx Lakeshore East Rail Corridor Expansion
(Don River to Scarborough GO Station) Project
Environmental Project Report

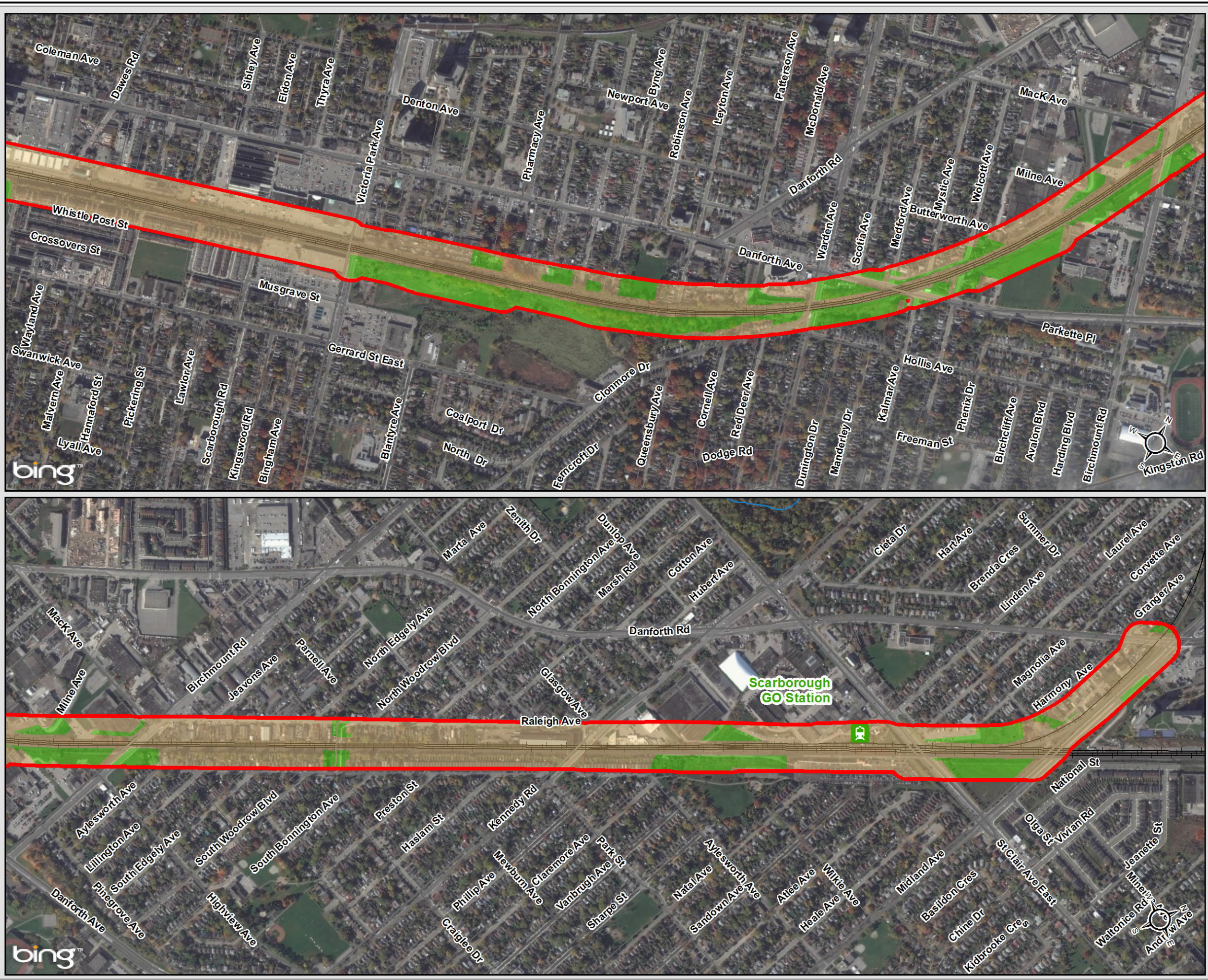
Results of Stage 1 Archaeological Assessment

November 2016

AECOM

Figure 4-7A

Map Document: (\\car1r1p001\\DATA\\Projects\\60315654\\00-Technical\\M02 Environmental Assessment (TPAP)\\GIS\\60315654_Archaeology_Stage1_Seg1_Fig4_4B.mxd) 2016-11-03 12:11:13 PM



Legend

- GO Stations
- Watercourse
- Stage 1 Study Area

Stage 1 Results

- Disturbed
- Potential for Deeply Buried Archaeological Resources. Stage 2 Test Pitting at 5 m Intervals Required
- Test Pitting Required at 5 m Intervals

Road Type

- Freeway
- Expressway / Highway
- Major Road
- Local
- Railway



0 50 100 200 300 400 500
m
1:10,000
MTM 3Degree, NAD 27

Contains information licensed under the Open Government Licence – Toronto, and Open Government Licence – Canadas. Bing Maps Aerial - © 2010 DigitalGlobe Image courtesy of USGS Earthstar Geographics SIO © 2016 Microsoft Corporation © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2016 Microsoft Corporation This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Metrolinx Lakeshore East Rail Corridor Expansion
(Don River to Scarborough GO Station) Project
Environmental Project Report

**Results of Stage 1
Archaeological Assessment**
November 2016

5. Assessment of Potential Effects and Proposed Mitigation Measures

The Project has the potential to create environmental condition changes that may result in both positive and negative effects. These condition changes have been considered through consultation with the public and stakeholders throughout the Pre-Planning Activities and TPAP.

O. Reg. 231/08 (Transit Projects Regulation) requires the proponent to prepare an EPR that contains the following information:

- An assessment and evaluation of the potential effects that the Project may have on the environment;
- A description of any measures proposed to mitigate any negative effects that the Project may have on the environment; and,
- A description of the means to monitor or verify the effectiveness of the proposed mitigations to reduce or eliminate adverse effects.

The purpose of this section is to document these requirements for the Lakeshore East Rail Corridor Expansion (Don River to Scarborough GO Station) Project. The effects of the Project have been assessed in terms of potential changes to natural, socio-economic, and cultural environments. **Table 5-1** below outlines the evaluation factors and related criteria for the assessment of potential effects and proposed mitigation measures for this Project.

Table 5-1: Evaluation Factors and Related Criteria

Technical Reports	Criteria
Natural Environment	<u>Terrestrial Features:</u> <ul style="list-style-type: none"> • Potential effects to vegetation communities and designated vegetation Species at Risk; • Potential effects to designated natural areas, including Environmentally Sensitive Areas, Areas of Natural and Scientific Interest, and Provincially Significant Wetlands; • Potential effects to wildlife habitat; • Potential effects to wildlife (birds, mammals, and herpetofauna), including wildlife movement, breeding and, potential increases in mortality; and, • Potential effects to terrestrial Species at Risk and Special Concern Species. <u>Aquatic Features:</u> <ul style="list-style-type: none"> • Potential changes in watercourse quality and fish habitat (potential contamination).
Soils and Groundwater	<ul style="list-style-type: none"> • Potential changes in soil quality; • Potential changes in groundwater quality and quantity; and, • Potential to encounter contaminated material during construction activities.
Air Quality	<ul style="list-style-type: none"> • Potential changes in air quality; • Potential change in emissions resulting from the Project.
Noise and Vibration	<ul style="list-style-type: none"> • Potential noise effects to receptors • Potential vibration effects to receptors.
Socio-Economic and Land Use	<ul style="list-style-type: none"> • Potential effects to existing land uses, including residential, commercial, institutional, and recreational; • Potential effects to parks and open spaces; • Changes in aesthetics/visual character as a result of the Project; • Potential effects to utilities during construction activities; and,

Table 5-1: Evaluation Factors and Related Criteria

Technical Reports	Criteria
	<ul style="list-style-type: none"> Potential effects to property (temporary and permanent).
Traffic and Transportation	<ul style="list-style-type: none"> Potential changes in road and traffic volumes; Potential effects to public transit operation and detours; and, Potential effects to pedestrian and cycling routes.
Cultural Heritage	<ul style="list-style-type: none"> Potential direct and indirect impacts to known Built Heritage Resources and Heritage Conservation Districts.
Archaeology	<ul style="list-style-type: none"> Potential discovery of archaeological resources.

5.1 Natural Environment

The majority of the construction associated with the Project will be limited to the existing Lakeshore East Rail Corridor. Potential effects associated with construction include loss of vegetation cover through vegetation removal and disturbance to local wildlife through noise or possible displacement. Potential impacts associated with operations include the disturbance and/or displacement of wildlife through increased noise and vibration. The following sections identify the key terrestrial and aquatic features that may potentially be impacted by the construction and operation of the proposed Project. Recommendations for mitigation measures and environmental monitoring are also provided. More detailed information is provided in the Natural Environment Effects Assessment (**Appendix B1**).

5.1.1 Terrestrial Features

5.1.1.1 Vegetation Cover and Designated Natural Areas

Potential Construction Effects

Currently, 48.15 ha of natural vegetation communities exist within the immediate vicinity of the existing Lakeshore East Rail Corridor. Of this, approximately 20.25 ha of natural vegetation communities within the immediate vicinity of the existing Lakeshore East Rail Corridor (42%) may be potentially affected by vegetation removal, as listed in **Table 5-2**. Generally, the surveyed vegetation communities that are closest to the Lakeshore East Rail Corridor have the highest concentration of invasive species indicating that habitat conditions are highly disturbed and are of poor quality. Given the highly developed landscape, the area in and immediately adjacent to the existing Lakeshore East Rail Corridor encompasses cultural communities largely comprised of vegetation that tolerates daily disturbance including invasive and/or non-native woody and herbaceous species. These species prefer areas of disturbance and are quick to re-colonize afterwards.

The northern boundary of the Williamson Park ESA is immediately adjacent to the Lakeshore East Rail Corridor. The addition of a fourth track will occur north of the Williamson Park ESA; therefore, potential vegetation removal within this area would be associated with the extension of the existing culvert east of Coxwell (Mile 329.50 – Small's Creek) and would be minimal and limited to within the Lakeshore East Rail Corridor. Vegetation removal proposed in areas outside of the Lakeshore East Rail Corridor, if required for the culvert modifications (i.e., staging areas), will be kept to a minimum and will avoid the Williamson ESA.

A breakdown of natural vegetation community removals which may result from the Project is provided in **Table 5-2** below.

Table 5-2: ELC Vegetation Communities Affected by Vegetation Removal

ELC Code	ELC Community	Size (ha) of Community within 120 m of the ROW	Area (ha) Removed (%)
CUH	Cultural Hedgerow	5.83	3.05 (52.3)
CUM1-1	Dry-Moist Old Field Meadow	10.85	3.85 (35.5)
CUT1	Mineral Cultural Thicket	1.7	0.37 (21.8)
CUT1-1	Sumac Cultural Thicket	0.54	0.45 (83.3)
CUW1	Mineral Cultural Woodland	23.78	11.10 (46.7)
FOD	Deciduous Forest	2.57	0.77 (30.0)
FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest	2.88	0.67 (23.3)
Total		48.15	20.25

Vegetation removal required for construction (i.e., staging) may be proposed in areas outside of the Lakeshore East Rail Corridor; however, the FOD7-3 community will be avoided wherever possible. While impacts to Deciduous Forest (FOD) designated and natural heritage features (e.g., Ravine and Natural Feature Protection areas) cannot be completely avoided, design refinements will be considered during Detailed Design to reduce impacts to FOD and natural heritage features where possible.

Potential Operations Effects

During operation of increased GO service, it is not anticipated that there will be any significant potential effects on vegetation cover or designated natural areas beyond the initial removal at the construction phase.

Mitigation

Vegetation removal will occur during the dormant months for vegetation (recommended as between November 1 and March 31 of any year) and will be kept to a minimum and limited to within the construction footprint. Where possible, stockpile materials and construction equipment will be stored within the construction footprint. Separate laydown and staging areas will likely be required which will be determined during Detailed Design. As laydown and staging areas are identified they will be subject to further environmental due diligence, as required. Construction fencing and/or silt fencing will be installed and maintained to clearly define the construction footprint and prevent accidental damage to vegetation or intrusion to adjacent vegetated areas. Construction fencing and/or silt fencing will be monitored and repaired as necessary throughout the construction period.

A planting plan will be either developed in consultation with the City of Toronto and/or the TRCA, or provided as a standardized approach developed by Metrolinx in consultation with the agencies. Permits and approvals related to City of Toronto Tree By-laws and municipal tree injury/removal permits will be obtained as required. To support permit applications, an Arborist Report, including tree inventory, will be completed by a qualified Arborist during Detailed Design where required. Post-planting monitoring of restoration areas will be completed after construction. Should the plantings and/or seed mix not survive, additional seeding and/or plantings will be undertaken with additional monitoring during the growing season, as per the landscaping warranty. Where City by-laws apply, an unplanned incidence of injured or critically damaged tree that is not part of any tree removal or injury permit will be reported to the City's Urban Forestry department immediately.

On-site inspection will be undertaken as required during construction by a qualified Arborist to ensure that only specified trees are removed, fencing is intact and there is no damage caused to the remaining trees and adjacent vegetation communities. Any damaged trees will be pruned through the implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. Where City by-laws apply, an unplanned incidence of injured or critically damaged tree that is not part of any tree injury/removal permit will be reported to the City's Urban Forestry department immediately.

5.1.1.2 Wetlands

Potential Construction Effects

There were no wetlands identified in or within the immediate vicinity of the existing Lakeshore East Rail Corridor within the Natural Environment Assessment Area that could be potentially affected by the Project, and therefore no potential effects to wetlands are anticipated as a result of construction of the Project. TRCA has indicated that a wetland (approximately 140 m from the Lakeshore East Rail Corridor) is being compensated for as a result of a proposed development site bounded by Gerrard Street East to the south, Victoria Park Avenue to the west, the Lakeshore East Rail Corridor to the north and Warden Avenue to the east. Metrolinx will consult with TRCA to determine the boundaries of the wetland compensation area and discuss proposed Project works in this area.

Potential Operation Effects

There were no wetlands identified in or within the immediate vicinity of the Lakeshore East Rail Corridor that could be potentially affected by the Project and therefore no potential effects to wetlands are anticipated as a result of operation of the Project.

Mitigation

No mitigation measures are recommended as potential effects on wetlands are not anticipated as result of construction or operation of the Project given that no wetlands were identified.

5.1.1.3 Wildlife Habitat

Potential Construction Effects

Proposed vegetation removal and temporary noise disturbance from construction activities may have potential effects on wildlife habitat identified within or near the Lakeshore East Rail Corridor.

Following MNRF guidance, the field investigations to-date indicates that the FOD7-3 and/or FOD communities identified in the area within 120 m of the Lakeshore East Rail Corridor may provide suitable habitat for bat maternity colonies. Any bat maternity colonies residing in cavities of trees, in or within 120 m of the Lakeshore East Rail Corridor, may be affected by construction activities through habitat loss, disturbance and/or possible mortality. Consultation with the MNRF during Detailed Design will indicate whether targeted surveys for bat SAR, or any SAR, might be required to determine detailed potential effects and confirm permitting needs/level, if warranted.

Potential Operations Effects

The potential increase in noise and vibration during the operations phase of the Project may displace bat maternity colonies if they are identified in or immediately adjacent to the Lakeshore East Rail Corridor.

Mitigation

Snag surveys are to be completed, subject to scope of work developed in consultation with MNRF during Detailed Design, in all forest and swamp communities where vegetation removal is proposed. Surveys will be conducted following the *Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis and Tri-coloured Bat* (MNRF, 2017) or as amended through consultation with MNRF regarding the scope of work. According to this protocol, any treed forest or swamp ecosites that include snags with DBH of at least 10 cm shall be considered suitable bat maternity roost habitat.

Tree removal in suitable bat maternity roost habitat identified through snag surveys (which shall be completed prior to construction, e.g., during Detailed Design) will be scheduled to occur outside of the bat roosting season of May 1st to September 1st and cannot occur during the bat maternity period of June 1st to July 31st, in accordance with MNRF's *Technical Note Species at Risk (SAR) Bats* (2015h) or as amended by MNRF through consultation. If this is not possible, tree removal may occur outside of the bat maternity period (June 1st to July 31st) in confirmed suitable bat maternity roost habitat provided that acoustic monitoring surveys, completed prior to vegetation removal, demonstrate that suitable cavity trees are not occupied by maternity colonies or SAR bats. Surveys will be conducted following the protocols described in the *Technical Note Species at Risk (SAR) Bats* developed by the MNRF (2015h). Additional monitoring may be required based on the results of additional surveys and consultations with the MNRF. A qualified Environmental Monitor will monitor the removal of suitable cavity trees.

Additional mitigation measures may be required based on the results of additional surveys and consultations with the MNRF. If additional surveys confirm the absence of suitable bat maternity roost habitat and no SAR bats were recorded, the above timing restrictions need not apply.

5.1.1.4 Breeding Birds

Potential Construction Effects

The existing Lakeshore East Rail Corridor traverses a heavily urbanized portion of Toronto, consisting of residential, commercial and industrial areas where natural vegetation is limited to city parks, open spaces, resident's front and backyards and in road and rail ROWs. All of these vegetated areas, excluding mown lawn, have the potential to provide breeding and nesting habitat birds. Numerous breeding birds were recorded in 2016 within and in the vicinity of the Lakeshore East Rail Corridor. The most commonly recorded bird species are common in Ontario and tolerant to disturbances associated with urban settings. However, many of the recorded bird species are protected under the *Migratory Birds Convention Act (MBCA)* while others receive protection under the *Fish and Wildlife Act*. Any harm or destruction to the migratory birds listed under the *MBCA*, their eggs and/or their active nests is prohibited. Displacement of breeding migratory birds and/or destruction of their active nests may occur as a result of vegetation removal. The potential effects on breeding birds are considered low provided that the avoidance and mitigation measures described below are implemented.

Potential Operations Effects

Breeding birds will not be significantly affected by the potential increase in noise and vibration during the operations phase of the Project, as the species occurring in the area within the Lakeshore East Rail Corridor are tolerant to disturbances associated with urban settings.

Mitigation

All works must be completed in compliance with the *MBCA*. Timing for the breeding bird season varies by habitat and weather conditions. Vegetation removal shall be scheduled to occur outside of May 1st to August 15th.

If vegetation must be removed between May 1st and August 15th, nest and nesting activity searches will be conducted by a qualified Biologist no more than 24 hours prior to vegetation removal. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (OBBA, 2001).

If an active nest or confirmed nesting activity of a migratory bird is observed, a species-specific buffer area following ECCC guidelines will be applied to the nest or confirmed nesting activity wherein no vegetation removal will be permitted until the young have fledged from the nest. The radius of the buffer will depend on species, level of disturbance and landscape context (ECCC, 2014), which will be confirmed by a qualified Biologist, but will protect a minimum of 10 m around the nest or nesting activity.

If construction activities related to the proposed culvert modifications or bridge widenings take place between May 1st and August 15th, nest surveys will be conducted to confirm absence of nests of migratory birds or bird SAR following Best Management Practices and the findings/results documented. If an active nest is observed, an environmental monitor shall be notified immediately. A qualified Environmental Monitor will be present during vegetation removal to ensure compliance with environmental requirements.

The results of all nest searches will be documented at the end of each survey day in a technical memorandum, including information on the searcher, date, time conducted, weather conditions, habitat type, vegetation community type, observations of breeding activity, observations of confirmed nests including co-ordinates, and, if required, the buffer applied to identified breeding/nesting sites.

5.1.1.5 Terrestrial Species at Risk and Special Concern Species

Plant Species at Risk and Species of Conservation Concern

Potential Construction Effects

Based on the results of the terrestrial field investigations, the following regionally rare plants may be affected by the proposed activities: Balsam Fir, Poison Ivy, Silky Dogwood, Wild Red Current, Sycamore, American Prickly-ash and Big Bluestem. A majority of these plants occur within the Fresh – Moist Willow Lowland Deciduous Forest (FOD7-3). This vegetation community is located in the Williamson Park ESA, south of the rail ROW and extends north to Merrill Bridge Road Park (Figure 3-10 and Figure 3-11 in **Appendix B1**). Additionally, TRCA flora records received on February 18, 2016 indicate potential for the presence of regionally rare Downy Arrow-wood in the deciduous forest (FOD) south of the rail ROW in Runnymede Lands, east of Victoria Park Avenue (Figure 3-17 in **Appendix B1**).

Background review also indicated the potential for Butternut to occur within the Natural Environment Assessment Area; however, this species was not observed during field investigations completed in July 2016. As species are assessed on at least an annual basis, it is possible that new species are added to the ESA or other rare species lists which would not have been surveyed for at this phase of the project. As such, targeted surveys for presence/absence of Butternut and/or other SAR or SOCC vegetation will be further reviewed during Detailed Design through consultation with the MNRF, and ground-truthed via surveys as required targeted at confirmed areas of disturbance to vegetation.

Potential Operations Effects

During operation of increased GO service, it is not anticipated that there will be any significant potential effects on plant SAR.

Mitigation

Generally, the vegetation clearing and grading required for the addition of a fourth track will avoid the locations of regionally rare plants with the exception of the FOD7-3 community located in Merrill Bridge Road Park where removal will be limited to the area within the Lakeshore East Rail Corridor.

Vegetation removal required for construction (i.e., staging) may be proposed in areas outside of the Lakeshore East Rail Corridor; however, the FOD7-3 community will be avoided wherever possible to avoid removal of the SAR or SOCC plant species (Balsam Fir, Poison Ivy, Silky Dogwood, Wild Red Current, Sycamore, American Prickly-ash and Big Bluestem). While impacts to Deciduous Forest (FOD) and designated natural heritage features (e.g.,

Ravine and Natural Feature Protection areas) cannot be completely avoided, design refinements will be considered during Detailed Design to reduce impacts to FOD and natural heritage features where possible.

If any Butternuts are identified during the Detailed Design within 50 m of the Lakeshore East Rail Corridor, a sample should be taken from each individual for genetic testing to determine purity/hybridity.

Where feasible, removal of pure Butternut trees will be avoided and protective fencing installed 50 m around the tree to limit any possible disturbance during construction. A qualified Environmental Monitor will monitor the removal of Butternut trees if any are required to be removed.

Mammal Species at Risk

Potential Construction Effects

Of the bats identified to potentially occur within the GTA according to the Atlas of the Mammals of Ontario (Dobbyn, 1994) and species range maps (BCI, 2016), four (4) species are listed as Endangered and they and their habitats are protected under the *ESA*, including Eastern Small-footed Bat, Little Brown Bat, Northern Long-eared Bat and Tri-colored Bat. The four potential SAR bats may forage widely but are dependent on suitable large snags or cavity trees with Diameter at Breast Height (DBH) of equal or greater than 10 cm that provide maternity roosts (MNRF, 2017). Consequently the removal of occupied snags or cavity trees, if any, would be detrimental to these bats, particularly during the most sensitive maternity roosting period of June 1st to July 31st; however, MNRF recommends avoiding vegetation removal from May 1st through September 1st to avoid any effects to bat SAR.

The four (4) bat SAR may also be negatively affected by noise disturbance as a result of construction activities.

Although SAR bats, specifically Little Brown Bat, may roost in manmade structures, no structures that would support roosting bats or maternity colonies (old houses, barns) are proposed for removal at this time.

Potential Operations Effects

The potential increase in noise and vibration during the operations phase of the Project may displace bat SAR if they are roosting in cavity trees within or adjacent to the Lakeshore East Rail Corridor.

Mitigation

Tree removal shall be scheduled to occur outside of the bat roosting season of May 1st to September 1st and strictly cannot occur during the bat maternity period of June 1st to July 31st, in accordance with MNRF's *Technical Note Species at Risk (SAR) Bats* (2015). If this is not possible, tree removal may occur outside of the bat maternity period (June 1st to July 31st) provided that acoustic monitoring surveys, completed prior to vegetation removal, demonstrate that suitable cavity trees are not occupied by SAR bats. Surveys will be conducted following the protocols described in the *Technical Note Species at Risk (SAR) Bats* developed by the MNRF (2015h) and the *Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-coloured Bat* (MNRF, 2017) or as amended through consultation with the MNRF. A qualified Environmental Monitor will monitor the removal of suitable cavity trees if identified through MNRF consultation and resulting requirements.

Additional mitigation measures and monitoring may be required based on the results of additional surveys and consultations with the MNRF. If additional surveys confirm the absence of SAR bats, the above timing restrictions need not apply.

Bird Species at Risk and Special Concern Species

Potential Construction Effects

Habitat within or in the vicinity of the existing Lakeshore East Rail Corridor was identified for two (2) bird SAR and four (4) SOCC.

Chimney Swifts were observed as flyovers during breeding bird surveys conducted in 2016. Although suitable for nesting and/or roosting habitat (e.g., chimneys) may occur within the Assessment Area, no effects to this species are anticipated as the Project does not require the removal of these structures and no suitable nesting structures were observed within the existing rail ROW.

Although it is unlikely that Barn Swallow will nest in bridges or culverts along the existing Lakeshore East Rail Corridor, a survey shall be conducted prior to construction if it is anticipated to start during the breeding bird season. This nest survey will ensure that no Barn Swallow or migratory birds protected under the *MBCA*, *Fish and Wildlife Act* or *ESA* have nested on these structures since the field investigations conducted in 2016.

Eastern Wood-pewee and Red-Headed Woodpecker require similar habitat requirements – patches of deciduous forests or cultural woodland although the latter prefers more open woodlands with dead trees for nesting and foraging (MNRF, 2015g; MNRF, 2015h). These habitats occur to a limited extent within and adjacent to the Lakeshore East Rail Corridor; however, neither of these species were observed during breeding bird surveys completed in 2016. The likelihood of potential effects (habitat loss, disturbance and/or mortality) to these species is considered low, given that measures to avoid and minimize effects to breeding birds will be implemented.

Wood Thrush breeding habitat is characterized by well-developed deciduous and mixed forests (MNRF, 2015i) greater than 1 ha. Presence of Wood Thrush was confirmed in the FOD7-3 community located in Merrill Bridge Road Park. Suitable habitat for Wood Thrush may occur elsewhere in FOD communities within or adjacent to the Lakeshore East Rail Corridor; however, vegetation removal will only occur within the Merrill Bridge Road Park. Wood Thrush is considered an area-sensitive species that require relatively large tracts of habitat. Vegetation removal will be limited to within the construction footprint, which is mostly within the Lakeshore East Rail Corridor. Following vegetation removal, the FOD7-3 community will maintain an area of less than 1 ha; therefore, following implementation of mitigation measures described below, no adverse effects (habitat loss, disturbance and/or mortality) on Wood Thrush are anticipated.

Although Common Nighthawk forages widely, roofs of buildings and openings in the canopy of the FOD7-3 or FOD communities may provide suitable nesting habitat (MNRF, 2015j). The gravel along the Lakeshore East Rail Corridor may provide marginally suitable habitats; however, these areas are narrow and immediately adjacent to the busy tracks such that it is highly unlikely that this species nests there. Although Common Nighthawk was not recorded during breeding bird surveys in 2016, MNRF indicated in correspondence received on January 26, 2016 for the potential of this species to occur within the Assessment Area. The likelihood of potential effects (habitat loss, disturbance and/or mortality) to this species is considered low provided that the avoidance and mitigation measures, described below, are implemented.

Potential Operations Effects

Bird SAR or SOCC nesting in or immediately adjacent to the Lakeshore East Rail Corridor may be negatively affected by the potential increase in noise and vibration during the operations phase of the Project.

Mitigation

Scheduling vegetation removal in accordance with the timing windows for breeding birds will avoid mortality and/or disturbance of bird SAR and SOCC species (Chimney Swift, Barn Swallow, Eastern Wood-pewee, Red-Headed Woodpecker, Wood Thrush, and Common Nighthawk) that may nest in deciduous forest and/ or cultural woodland communities. If vegetation must be removed between May 1st and August 15th, nest and nesting activity searches will be conducted by a qualified Biologist 24 hours prior to vegetation removal to avoid mortality and disturbance.

If construction activities related to the proposed culvert modifications or bridge widenings take place between May 1st to August 15th, nest surveys will be conducted to confirm absence of nests of Barn Swallow or other birds protected under the *MBCA*. If an active nest is observed, an environmental monitor shall be notified immediately.

5.1.2 Aquatic Features

5.1.2.1 Potential Construction Effects

The use of machinery in or around water poses risks of fuel contamination and spills from equipment use. Fuel contamination and spills any kind can potentially limit aquatic species ability to carry out their life processes. Removal of vegetation along the riparian corridor and earth moving activities may result in increased exposed soils and greater risk for soil erosion and sedimentation to the watercourse. This can result in a decrease in water clarity, increases in total suspended solids, downstream deposition of materials and stress to fish present within the vicinity of construction activities.

Based on Preliminary Design it is anticipated that in or near water works may be required at Small's Creek.

5.1.2.2 Potential Operational Effects

The potential operational effects of the Project include: potential fuel spills from daily operation of trains and permanent alterations to grading or changes in slope which may result in increased risk of erosion and sediment transport to the watercourse.

5.1.2.3 Mitigation

Project Planning

- The need for in or near water works will be determined during Detailed Design. Project in-water works will be planned in accordance with the warm water timing window (i.e., in-water works permitted between July 1st and March 31st). For any areas identified during Detailed Design that require in or near water works, a Self-Assessment under the *Fisheries Act* will be undertaken by a qualified professional to determine appropriate mitigation measures and to confirm whether further assessment and review is required by DFO.
- Stormwater management will be reviewed and addressed during Detailed Design and will be in accordance with the Council adopted City of Toronto Wet Weather Flow Management Guidelines.
- If works in the vicinity of Small's Creek are required, including in-water, near water, or natural features associated with this creek, TRCA will be consulted through the Voluntary Project Review Process described in **Section 8.2.4.1**.

Erosion and Sediment Control

- An Erosion and Sediment Control Plan will be developed and will include the requirement for a spill kit to be on site at all times during construction. Implementation of the erosion and sedimentation control measures will

conform to recognized standard specifications such as Ontario Provincial Standards Specification (OPSS). Sediment and erosion control measures (e.g., silt curtains, silt fence) shall be installed prior to site clearing, grubbing, excavation or grading works.

- Stockpiled material will be stored at a safe distance from waterways to ensure no deleterious substances enter watercourses.

Operation of Machinery

- Machinery will arrive on site in a clean condition and be maintained free of fluid leaks, invasive species and noxious weeds. Whenever possible, machinery will be operated on land above the high water mark, in a manner that minimizes disturbance to the banks and bed of the waterbody.
- Machinery will be washed, refuelled, and serviced properly away from any waterbody. Storage of fuel and other materials for the machinery will be in such a way as to prevent any deleterious substances from entering the water.
- The construction contractor will be required to develop and implement a site specific Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals and/or spills in a timely and effective manner and to avoid soil and water contamination.

5.2 Soils and Groundwater

5.2.1 Potential Construction Effects

Potential effects due to the disturbance of existing contaminated sites and the release of contaminants could include reduction in soil quality due to accidental release of contaminants during construction. There is also the potential for sediments to enter watercourses as a result of site clearing, stockpiling, cut/fill activities, excavation and construction activities.

General construction activities such as vehicle and equipment operations have the potential to change soil quality through minor contaminant releases. Spills consisting of materials that constitute a contaminant (fuels, lubricating oils and other fluids) may affect soils and will therefore have to be managed.

Construction workers may be exposed to designated substances identified in the *Occupational Health and Safety Act*. Existing railway ties were observed to be stained black during the Phase I ESA investigation (SPL, 2011), and it is expected that creosote was used in wood preservation. Typical constituents of creosote include phenol, cresol and xylenols which have the potential to contaminate soil and groundwater within the corridor. Soil and groundwater potentially contaminated with VOC may be encountered during general constructions activities. Disturbance of contaminated soils and/or subsoils during construction activities may result in an accidental release of contaminants to the environment due to erosion and sedimentation of contaminated soil stockpiles and/or the improper handling and disposal of contaminated soils.

Subsurface excavation below the water table may be required to allow for the construction of structural elements (e.g., culverts, embankments, foundations, footings, abutments and/or piers) necessary for the bridge widenings and culvert modifications within the Study Area. As a result, construction dewatering may be required to achieve dry working conditions. As prescribed under *O. Reg. 63/16*, water taking for construction site dewatering in excess of 50,000 L/day and under 400,000 L/day is subject to registration through the Environmental Activity and Sector Registry (EASR). Where construction dewatering volumes are expected to exceed 400,000 L/day, a Permit to Take Water (PTTW) will be required from MOECC, in accordance with Section 34 of the *Ontario Water Resources Act* (OWRA). Similarly, approvals for the discharge of pumped water also will be required, which could include one or a combination of Municipal Discharge Permits, Conservation Authority Approval (through the Voluntary Project Review process), and/or MOECC Environmental Compliance Approval (ECA) (OWRA, Section 53).

Construction dewatering activities have the potential to affect groundwater quantity, resulting in decreases in baseflow to watercourses, groundwater discharge to wetlands, yield of private water wells and groundwater flow patterns. Where dewatering occurs, local water table elevations will be temporarily lowered to facilitate construction under dry conditions. These effects are confined to the Zone of Influence (ZOI) from dewatering activities and are typically temporary in nature. Private water wells located within the dewatering ZOI, where groundwater levels have been lowered to facilitate construction, have the potential to be effected temporarily by lower well yields and/or changes in water quality. A reduction in well yield and/or water quality may result in the inability to use the well as a potable water source. Construction dewatering activities may also result in a decrease in groundwater contribution to groundwater-dependent natural features (i.e., wetlands, watercourses, ponds and lakes) resulting in declines in surface water levels/flow, temperature changes, and potential loss of habitat. Estimates of water taking quantities and resultant dewatering ZOI would be determined during Detailed Design.

5.2.2 Potential Operations Effects

Potential effects due to the disturbance of existing contaminated sites and the release of contaminants could include reduction in soil quality due to accidental release of contaminants during operations. General operations activities such as maintenance vehicle and equipment operations have the potential to change soil quality through minor contaminant releases. Maintenance activities do not typically involve the use of large quantities of fuel so the likely risk of contaminant release is from maintenance trucks or other vehicles.

In areas where 'cut' or 'fill' is required that result in permanent changes to the original ground topography, corresponding changes to groundwater flow patterns (i.e., rate, direction, gradient, etc.) may occur. Since the proposed rail line will be constructed at the same grade as the existing rail, changes in groundwater flow patterns from the proposed expansion is expected to be negligible at the present time. Similarly, reduction in groundwater recharge as a result of increases in impervious surfaces or the placement of fill is considered to be negligible.

5.2.3 Mitigation

An Erosion and Sediment Control Plan will be developed and will include the requirement for a spill kit to be on site at all times during construction. Implementation of the erosion and sedimentation control measures will conform to recognized standard specifications such as Ontario Provincial Standards Specification (OPSS). Sediment and erosion control measures (e.g., silt curtains, silt fence) shall be installed prior to site clearing, grubbing, excavation or grading works.

Stockpiled material shall be stored at a safe distance from waterways to ensure no deleterious substances enter watercourses.

Prior to construction, a Waste Management Plan will be developed to address proper handling of all excess materials that may be potentially contaminated. Signs of soil impacts (i.e., visual and/or olfactory indicators) will be managed according to standard industry best practices during construction activities.

Construction of the railway expansion, grade separations, and construction works at the bridge locations is expected to generate excess soil that cannot be reused on site due to its geotechnical properties or quality of the excess soil. In all cases the on-site and off-site beneficial reuse of excess soil will be explored by the Project team and will be undertaken in accordance with *Excess Soil – A Guide to Best Management Practices* (MOECC, January 2014). It is noted that the MOECC is presently contemplating the creation of a Regulation to govern excess soil management. Should this Regulation come into force within the implementation of the project the requirements will be incorporated, as applicable. A geotechnical report will be completed during Detailed Design.

All contaminated materials will be handled according to applicable provincial and federal legislation, regulations and standard procedures. O. Reg. 347 under the Ontario *Environmental Protection Act* outlines requirements for on-site handling, mixing and processing of waste disposal sites and waste management systems.

The construction contractor will be required to develop and implement a site specific Health and Safety Plan and a Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals and/or spills in a timely and effective manner and to avoid soil and water contamination.

If potential areas of contamination are identified during operations, further investigations will be completed to determine if contamination is present and what remedial action is necessary. All contaminated materials found during operation and maintenance activities will be handled in accordance with applicable provincial and federal legislation, regulations and standard procedures.

Appropriate best management practices (e.g., spill prevention and response) will be implemented during operations and maintenance to mitigate potential impacts to soil and groundwater.

Phase I ESAs will be completed for additional lands required for the Project (both permanent and temporary) during the Detailed Design phase. Additional studies and mitigation will be implemented as warranted based on the findings of those investigations.

Estimates of water taking quantities and resultant dewatering ZOI would be determined during Detailed Design. If dewatering is required a water taking permit (PTTW or EASR registration, as required) will be obtained. Requirements for monitoring during active construction dewatering for any potential adverse effects will be identified during Detailed Design.

Prior to construction, a Waste Management Plan shall be developed to address proper handling of all excess materials, including those that may be potentially contaminated, according to applicable legislation, regulations and standard procedures.

Prepare a Soil Management Plan during Detailed Design to address known contamination and any found during construction works.

The construction contractor will be required to develop and implement a site specific Health and Safety Plan and a Spill Prevention and Response Plan.

5.3 Air Quality

An Air Quality Impact Assessment Report has been completed for six GO Transit rail corridors including the Lakeshore East Rail Corridor. The assessment was completed in support of Electrification; however, the impacts and mitigation information contained in the report provides details relevant to the Lakeshore East Rail Corridor Expansion from Don River to Scarborough GO Station. A copy of the Air Quality Impact Assessment Report is provided in **Appendix B2b**. It is important to note that Electrification is subject to a separate standalone environmental assessment following the Transit Project Assessment Process.

The consideration of operations was based on a credible worst-case scenario. The credible worst-case scenario is based on the minimum infrastructure requirements to achieve a service goal. Regulations and policies based on operational and safety considerations limit the service levels that can be achieved for a given infrastructure design.

Current rail regulations are principally governed by Transport Canada and the US Federal Rail Administration. Rail policy has also been developed by the American railway Engineering and Maintenance of Way Association

(AREMA) and the American Public Transportation Association (APTA). Metrolinx, CN and CP have also established additional operational policies, standards, and rules to ensure safe and reliable service. Collectively, these regulations and policies dictate how railways are designed, operated and maintained. To expand rail service, the regulations and policies have to be considered. If the existing infrastructure does not allow expanded service (as is the case for the Lakeshore East Rail Corridor from Don River to Scarborough GO Station) then new infrastructure must be considered. Service goals represent long term planning upon which infrastructure plans are developed. Therefore the proposed infrastructure and service levels represent a credible worst-case scenario.

For diesel-powered trains, each locomotive includes a main engine for motive power, and a generator (termed Head End Power [HEP] unit) that provides electricity to passenger cars for the purposes of lighting, heating/cooling, etc. Both the engine and the HEP unit emit contaminants of concern due to the combustion of diesel fuels.

For electric-powered trains, the motive power, all lighting, heating/cooling, etc. are supplied by electricity. Although in this case there are no direct combustion emissions from the trains themselves, there could be increased emissions from fossil fuel power plants in order to meet the additional electricity demand as a result of the electrified trains.

In order to assess the impacts on air quality, it was necessary to quantify and compare the fossil fuel emissions from two scenarios:

1. A baseline scenario where the trains that are planned to become electrified are assumed to remain diesel-powered; and,
2. An electrification scenario where the same number of trains are electrified, requiring increased power from fossil fuel power plants.

It should be noted that not all trains (e.g., non-Metrolinx trains) will be electrified in the future and some will remain diesel-powered. However, as the assessment focuses on the change in emissions between the two scenarios, trains that will remain diesel powered were excluded from this assessment as their emissions will not change.

Besides combustion emissions, the trains also produce non-exhaust emissions of particulate matter, which arise from normal wear and tear on the rails, wheels, brake linings, and other moving parts. These emissions are produced by both diesel and electric trains and are not expected to change significantly as a result of electrification. The quantification of combustion emissions from diesel locomotives and emissions from additional electricity demand are described in **Appendix B2b**.

5.3.1 Potential Construction Effects

Air quality impacts from construction activities are largely unavoidable, but are only temporary in nature and their impacts can be minimized with adequate controls. Construction activities will involve heavy equipment that generates air pollutants and dust. In general, the total emissions from construction activities are expected to be minimal compared to the total regional emissions, especially over the long term.

5.3.2 Potential Operations Effects

Table 5-3 reflects the overall annual emissions for diesel locomotives to be operating on all six rail corridors, including the Lakeshore East Rail Corridor, that are proposed to be electrified.

Table 5-3: Annual Emissions from Diesel Locomotives

Pollutant	Annual Emissions (tonnes/year)
NO _x	3,170
CO	1,050
VOC	294
PM _{2.5}	108
CO _{2e}	327,000

5.3.3 Mitigation

The proposed future electrification of Metrolinx trains within the Lakeshore East Rail Corridor will serve to reduce emissions from train operations. **Figures 5-1 to 5-5** (source data available in **Appendix B2b**) show the change in emissions between diesel trains and electric trains for:

- NO_x;
- CO;
- VOCs;
- PM_{2.5}; and
- greenhouse gases in terms of carbon dioxide equivalent (CO_{2e}).

Emissions are shown for Metrolinx diesel trains and for electrified trains. Electrified train emissions are shown for:

- Two electrification scenarios: with and without regenerative braking; and,
- Two emission scenarios: assuming all electricity generation is from gas power plants and assuming electricity generation is distributed evenly across all types of power generating stations.

All four electrification scenarios show a net benefit from electrification (reduction in emissions). Even for the case when all electricity is generated from gas power plants, most pollutants show a substantial decrease in emissions after electrification. In general, this is because large gas power plants tend to have better emission controls compared to individual diesel engines, and because natural gas tends to be a cleaner fuel. The decrease in greenhouse gases (CO_{2e}) between the diesel scenario and a gas-powered electrification scenario was only very slight. This is because diesel fuel is basically being replaced by natural gas fuel which emits only slightly less carbon dioxide per unit energy. When electricity production is assumed to be distributed over the various types of power plants in Ontario, the benefits of electrification with respect to air quality and climate change become much more apparent.

Figure 5-1: Summary of Annual NOx Emissions

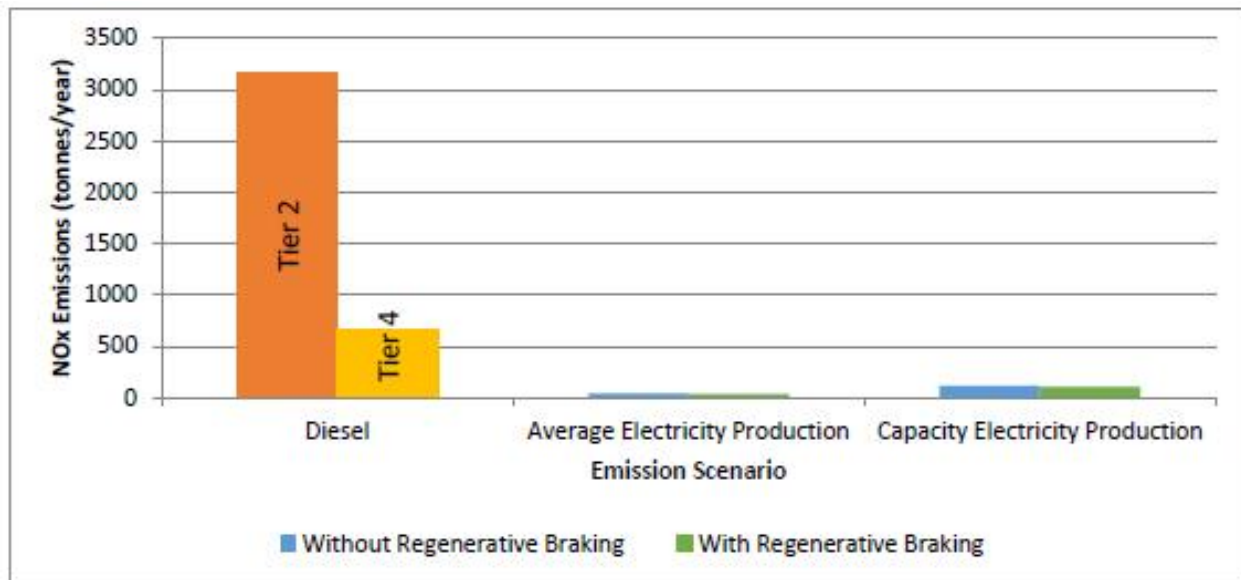


Figure 5-2: Summary of Annual CO Emissions

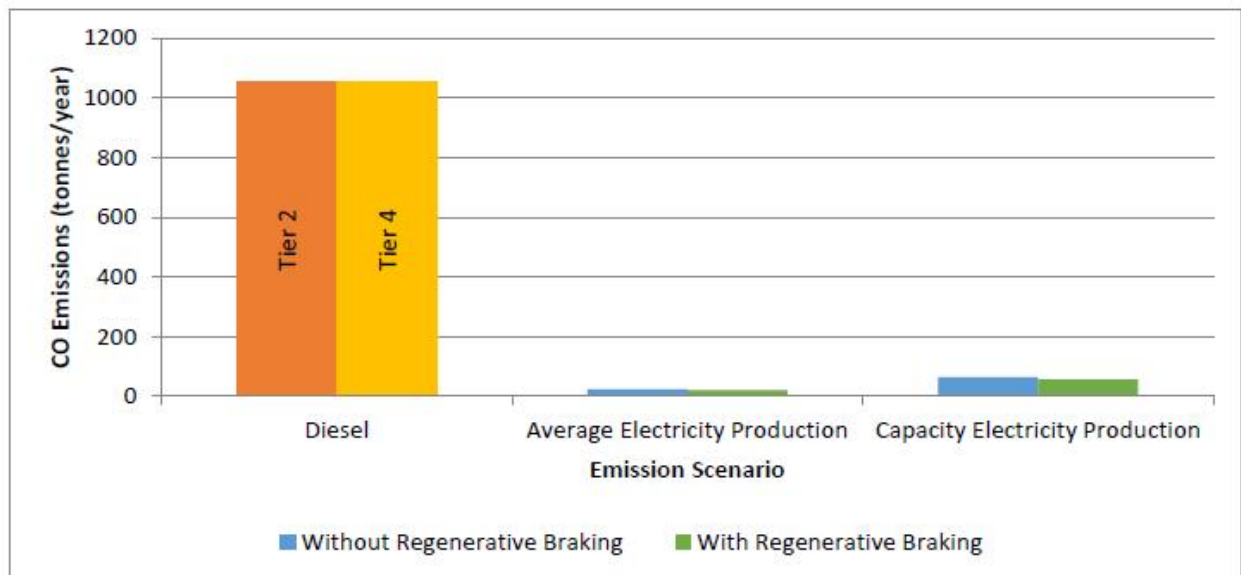


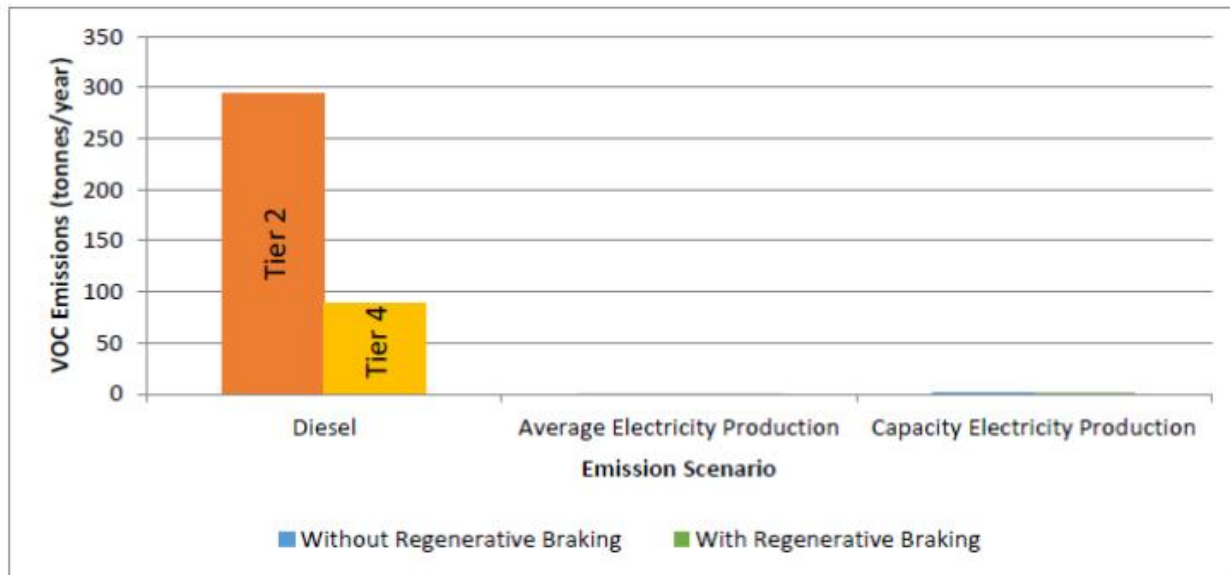
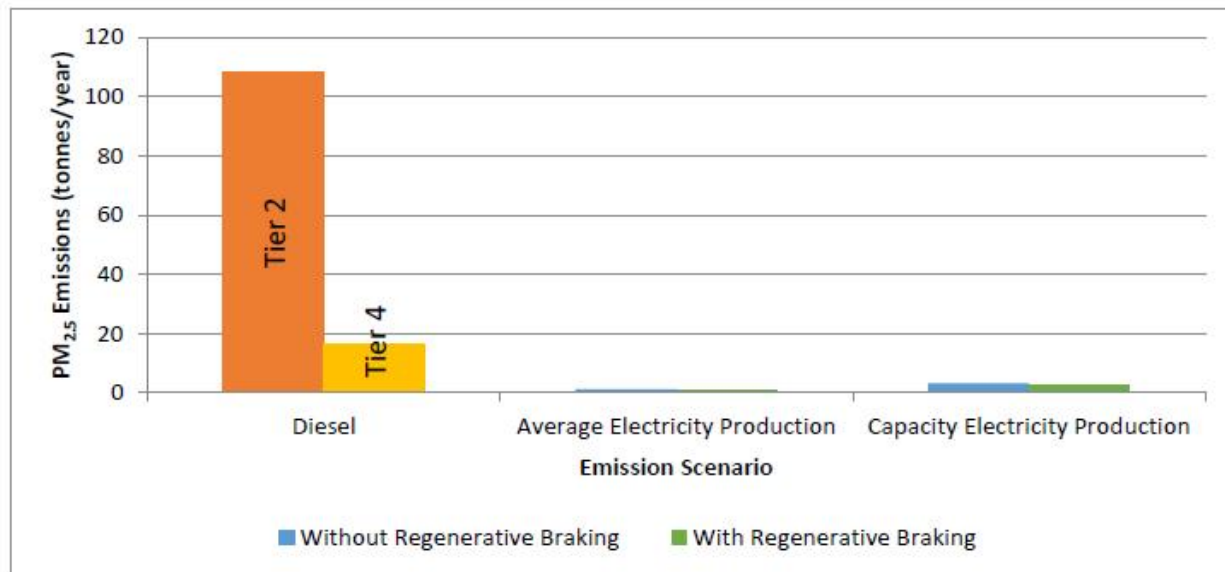
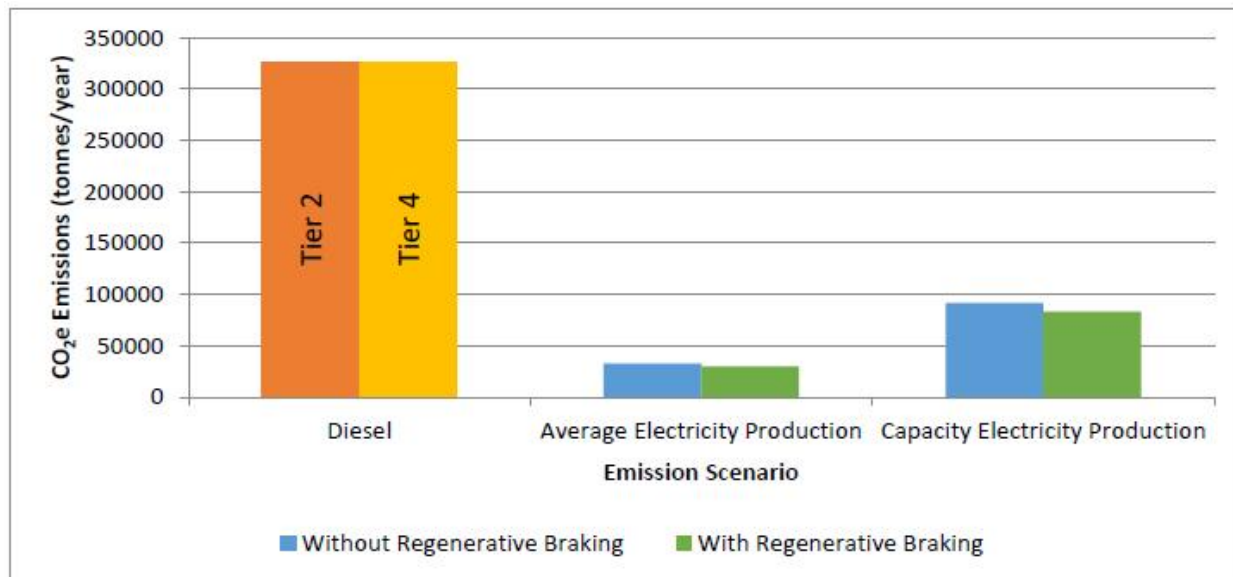
Figure 5-3: Summary of Annual VOC Emissions**Figure 5-4: Summary of Annual PM_{2.5} Emissions**

Figure 5-5: Summary of Annual CO₂e Emissions

In general, the future electrified system will have lower maintenance requirements than a diesel-powered system. The electric system will require an increase in right-of-way maintenance due to the added infrastructure of the traction power system, but the added amount of activity is small compared to that required for maintenance of tracks, signals and structures. No significant changes to emissions or new sources of air emissions are expected as a result of maintenance.

By-products of combustion (NO_x, CO, VOCs, and PM) from trucks or other construction equipment can be minimized by ensuring that any diesel equipment complies with the latest emission standards (Tier 3 or Tier 4). To further mitigate potential impacts associated with emissions from construction equipment:

- Equipment will be kept in good operating condition;
- Equipment idling time will be minimized; and
- Stationary equipment (e.g., generators, compressors) will be located as far away from sensitive receptors as practical.

Dust resulting from construction activities will be minimized by watering or applying other dust suppressants, covering up stockpiles, reducing travel speeds for heavy vehicles, minimizing haul distances, and efficiently staging construction activities. A Dust Control Plan will be developed for implementation during construction. The dust control measures will conform to recognized standard specifications such as Ontario Provincial Standards Specification (OPSS) and *Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities* (March 2005), as practical.

5.4 Noise and Vibration

A Noise and Vibration Modelling Report has been completed to predict existing and future noise and vibration levels for six GO Transit rail corridors including the Lakeshore East Rail Corridor and to assess potential impacts in accordance with the applicable guidelines. This was completed in support of Electrification; however, the existing conditions information contained in the report provides details relevant to the Lakeshore East Rail Corridor Expansion from Don River to Scarborough GO Station. A copy of the Noise and Vibration Modelling Report is

provided in **Appendix B3**. It is important to note that Electrification is subject to a separate standalone environmental assessment following the TPAP.

Modelling was completed using the “Federal Noise and Vibration Impact Assessment” (FTA Protocol) (FTA, 2006) incorporated in Cadna/A. This approach to modelling was discussed with MOECC. Please refer to **Appendix B3** for additional information regarding the FTA prediction method.

Diesel and electric locomotives were defined using the FTA standards implemented into Cadna/A. At the time of the initial assessment, the electric locomotive train type was defined mathematically within Cadna/A with a “K” constant that differed from the “K” constant defined in the FTA Protocol. Following the preliminary assessment, an option within Cadna/A to use the “K” constant which corresponds to the FTA Protocol was created by the developers of the Cadna/A software. Re-assessment using the latter Cadna/A option was subsequently completed, and the results of the re-assessment were used in place of the earlier results. The resultant impacts of this correction are discussed in **Section 5.4.3.1** below.

5.4.1 Potential Construction Effects

5.4.1.1 Noise

Various aspects of the project construction will generate noise. Construction noise impacts are temporary in nature, and largely unavoidable. In order to keep the railway operating during the daytime, some construction efforts may be undertaken at night, although this will be avoided wherever possible.

5.4.1.2 Vibration

Vibration may be measured using different descriptors. The descriptor used in this assessment is peak particle velocity (PPV), measured in mm/s. PPV best predicts the effect of vibration on structures. Based on the US Federal Transit Administration (FTA), the threshold of vibration annoyance in residences is approximately 0.4 mm/s PPV. The FTA recommends limits for construction vibration to prevent damage to structures, which are presented in **Table 5-4** (FTA, 2006).

Table 5-4: Recommended Vibration Levels (from FTA)

Category	Description	Criteria
Construction Vibration Damage Levels	Reinforced-concrete, steel or timber (no plaster) ¹	13 mm/s PPV
	Engineered concrete and masonry (no plaster) ¹	8 mm/s PPV
	Non-engineered timber and masonry buildings ¹	5 mm/s PPV
	Buildings extremely susceptible to vibration damage ¹	3 mm/s PPV
Potential Annoyance Vibration Levels	Vibration Category 2 - Residential, Frequent Events ²	0.4 mm/s PPV

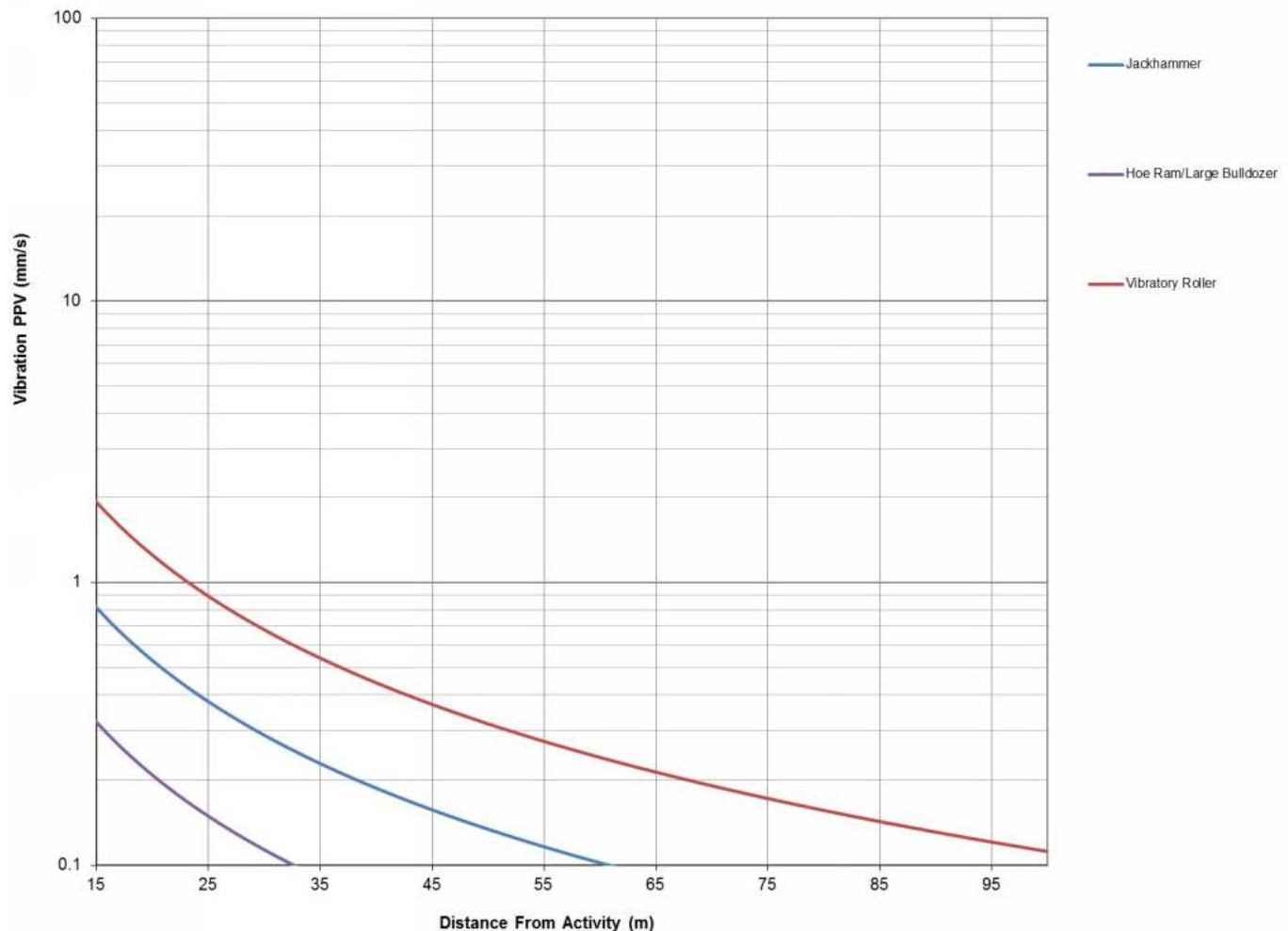
Notes: 1. FTA Transit Noise and Vibration Impact Assessment, Chapter 12: Construction Vibration Damage Criteria
2. FTA Transit Noise and Vibration Impact Assessment, Chapter 8: Vibration Impact Criteria Table 8-1 Ground-Borne Vibration and Ground-Borne Noise Impact Criteria for General Assessment

A short-list was developed of equipment that has the greatest potential to produce ground-borne vibration and that may be used during construction of the project. The equipment chosen for analysis was as follows: a jackhammer, a hoe ram or large bulldozer and a vibratory roller.

Construction activities will vary temporally and spatially as the project progresses. Vibration levels from construction at a given receptor location will also vary over time as different activities take place, and as those activities change location within the right-of-way.

At this time, detailed construction plans are not available. Using the peak particle velocity of the equipment anticipated to create the greatest impact, listed in Table 12 of **Appendix B3**, an analysis of potential worst-case construction vibration levels has been conducted based on various setback distances to receptors. Results are shown in **Figure 5-6**.

Figure 5-6: Anticipated Construction Vibration Level at Various Distances to Receptors by Vibration Source



Vibration levels have the potential to cause annoyance at nearby residences that are within 45 m of construction activities (i.e., the vibration levels are greater than 0.4 mm/s), but are predicted to remain below 1.9 mm/s PPV at all locations greater than 15 m from the construction vibration source. The predicted vibration levels are below the lowest of the criteria (3 mm/s PPV), which corresponds to the vibration level for which sensitive buildings (i.e., heritage buildings) are susceptible to vibration damage. Other building structures made of materials such as non-engineered timber and masonry or engineered concrete and masonry or reinforced-concrete, steel or timber can withstand higher construction vibration levels.

5.4.2 Potential Operations Effects

5.4.2.1 Noise

The desirable objective as defined in the MOEE/GO Draft Protocol is that the daytime equivalent sound level (L_{EQ}) (16-hr, 0700h-2300h) produced by future rail service operation of the project under assessment shall not exceed the higher of:

- The daytime ambient sound level, combined with the sound level from existing rail activity; or
- 55 dBA L_{EQ} (16-hr).

Furthermore, the nighttime L_{EQ} (8-hr, 2300h-0700h) produced by the future GO Transit rail service operation of the project shall 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 MOEE/GO Draft Protocol states that noise effects at a receptor shall be expressed in terms of the Adjusted Noise Impact. The Adjusted Noise Impact is based on the difference between pre-project noise (i.e., including ambient and pre-project rail noise) and post-project noise (i.e., including ambient and future 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 is taken as 55 dBA L_{EQ} (16-hr) daytime or 50 dBA L_{EQ} (8-hr) nighttime.

According to the MOEE/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), mitigation of the sound levels is investigated and evaluated for technical feasibility. The term “technical feasibility” refers to the ability of a mitigation measure to achieve a significant noise reduction (at least 5 dB) at the intended impact locations.

For the Adjusted Noise Impact between existing and future scenarios please see Table 3a (diesel scenario) and Table 3b (electric scenario) of **Appendix B3**.

5.4.2.2 Vibration

Vibration effects were predicted in accordance with the methods of the United States Department of Transportation - Federal Transit Administration (FTA, 2006). Vibration levels were expressed in terms of root-mean-square (RMS) velocity in the vertical direction, which is the dominant axis for vibration generated from mobile sources such as trains and most closely correlated with human annoyance and perceptibility. The relative change between existing and future vibration levels is presented as a percentage. Please refer to **Appendix B3** for additional information regarding methodology and assumptions.

The desirable objective of the MOEE/GO Draft Protocol is that the RMS velocity of vibration produced by the future GO Transit operations at a receptor should not exceed:

- 0.14 mm/s; or
- The existing vibration levels where existing operations already produce vibration that exceeds 0.14 mm/s.

Furthermore, the MOEE/GO Draft Protocol stipulates that the requirement to evaluate mitigation is triggered when the RMS velocity exceeds the objective by 25% or more (i.e., the greater of 0.175 mm/s, or a 25% increase over existing levels).

The predicted existing and future vibration levels and change in vibration levels for a GO train pass-by, passenger train and a freight train pass-by are presented in **Table 5-5**.

The predicted change in vibration level between existing conditions and future conditions (both electric diesel) is in excess of the 25% increase threshold set out in the MOEE/GO Draft Protocol, at all of the identified receptors except R027 and R031. In the case of receptors R021B and R023B, the threshold is exceeded during pass-bys of GO trains, passenger trains and freight trains. In the case of receptors R037B and R043, the threshold is exceeded during pass-bys of GO trains and freight trains. In the case of R013 the threshold is exceeded during freight pass-bys only.

Table 5-5: Vibration Assessment Results for GO and Freight Trains

Train Type Assessed	Receptor ¹	Speed Over Track (km/h)	Special Trackwork Present		Distance to Rail Component		Predicted Vibration Level		Objective (mm/s)	% Above Objective	Mitigation Required? ²
			Existing	Future	Existing (m)	Future (m)	Existing (mm/s)	Future (mm/s)			
Go Train	R021B	153	No	Yes	30	25	0.11	0.81	0.14	480%	Yes
VIA Train		152					0.11	0.30	0.14	115%	Yes
Freight Train		104					0.81	6.11	0.81	652%	Yes
Go Train	R023B	153	No	Yes	35	30	0.09	0.66	0.14	373%	Yes
VIA Train		152					0.09	0.25	0.14	76%	Yes
Freight Train		104					0.66	4.83	0.66	627%	Yes
Go Train	R037B	153	No	Yes	42	42	0.08	0.46	0.14	229%	Yes
VIA Train		152					0.08	0.17	0.14	22%	No
Freight Train		104					0.53	3.17	0.53	494%	Yes
Go Train	R043	153	No	Yes	74	74	0.04	0.25	0.14	78%	Yes
VIA Train		152					0.04	0.09	0.14	N/A	No
Freight Train		104					0.29	1.75	0.29	494%	Yes
Go Train	R013	153	No	No	25	20	0.14	0.17	0.14	24%	No
VIA Train		152					0.14	0.17	0.14	23%	No
Freight Train		104					1.03	1.35	1.03	31%	Yes
Go Train	R031	153	No	No	35	30	0.09	0.11	0.14	N/A	No
VIA Train		152					0.09	0.11	0.14	N/A	No
Freight Train		104					0.66	0.81	0.66	22%	No
Go Train	R027	153	No	No	40	35	0.08	0.09	0.14	N/A	No
VIA Train		152					0.08	0.09	0.14	N/A	No
Freight Train		104					0.56	0.66	0.56	19%	No

Note: 1. See **Figures 5-7E to 5-7G** for receptor location.

2. The MOEE/GO Draft Protocol stipulates that the requirement to evaluate mitigation is triggered when the vibration velocity exceeds the objective by 25% or more (i.e., the greater of 0.175 mm/s, or a 25% increase over existing levels).

5.4.3 Mitigation

5.4.3.1 Noise

Construction

A Construction Noise Management Plan will be developed prior to construction. The plan will include a complaint response protocol. The following are examples of what the plan may include:

- Inform surrounding property owners of anticipated upcoming construction works, including any work at night.
- As possible, will endeavour to limit construction to the time periods permitted by the City of Toronto Noise By-law.
- Properly maintain all equipment.
- Any initial noise complaint will trigger verification that general noise control measures are in effect.
- In the presence of persistent noise complaints, verify that all construction equipment complies with comply with MOECC NPC-115 guidelines.
- In the presence of persistent complaints and subject to the results of a field investigation, alternative noise control measures may be required.

In selecting appropriate construction noise mitigation measures, consideration will be given to the technical, engineering and economic feasibility of the various alternatives.

Operations

If the Adjusted Noise Impact at a receptor is deemed significant during the daytime period, technical feasibility of a noise barrier is evaluated based on the noise reduction achieved during the daytime period only. Similarly, if the Adjusted Noise Impact at a receptor is deemed significant during nighttime period, technical feasibility of a noise barrier is evaluated based on the noise reduction achieved during the nighttime period only. If the Adjusted Noise Impacts at a receptor are deemed significant during both the daytime and nighttime periods and noise reduction resulting from a noise barrier is at least 5 dB in either the daytime or nighttime period, the noise barrier is deemed technically feasible.

Metrolinx presented the results of preliminary noise modelling for future RER electrified service at a series of public consultations throughout the TPAP that showed a limited number of areas where mitigation was identified but later shown to not fully trigger a delta increase of 5dBA. This was a result of the correction to the noise modelling input(s) that more accurately reflected the quieter nature of electrified locomotives during times of acceleration, noted earlier in **Section 5.4**. Metrolinx believes these supplemental areas should still be included for consideration of noise mitigation.

For noise barriers located along the rail corridor, Metrolinx may use up to a maximum height of 5 m for all new or replacement noise barriers. Higher noise barriers require specially engineered footings, which may not be technically and/or economically feasible to implement. The investigation of mitigation was limited to noise barriers with heights of 5 m or less.

Mitigation measures were investigated for each of the receptor locations where a Significant Noise Impact occurred, in accordance with the MOEE/GO Draft Protocol. Of the noise barriers investigated, some barriers were not able to adequately reduce the noise with a practical barrier height. These barriers were deemed technically infeasible. The remaining barriers were deemed feasible.

For barrier evaluation, sound levels were predicted with all investigated barriers in place; therefore, predicted effect of some barriers may be influenced by other nearby investigated barriers. Barrier height and effectiveness will be reviewed during the Detailed Design phase, as the detailed grading information is required to accurately calculate the final effectiveness of the barrier.

For the future diesel scenario, of the 47 noise barriers investigated, 12 barriers were not able to adequately reduce the noise with a practical barrier height. These barriers were deemed technically infeasible. The remaining 36 barriers were deemed feasible.

For the future electric RER scenario, mitigation measures were investigated for 28 receptor locations where a significant (or greater) Adjusted Noise Impact occurred. Of the noise barriers investigated, 20 barriers were deemed technically feasible.

For the detailed summary of technical feasibility of noise barriers please see Table 7a (diesel scenario) and Table 7b (electric scenario) of **Appendix B3**.

Figures 5-7A to 5-7D reflect the location of barriers deemed technically feasible for the future diesel and electrification scenarios. Mitigation will be implemented for the ultimate electrification scenario.

At this stage in the design, the type of noise mitigation is not being defined but Metrolinx is thinking ahead to what options will best meet community needs and will ensure that noise mitigation is provided, where required. Noise walls are typically the most effective at reducing noise, and they also take up much less space than a berm. There are also other technologies that work to reduce the noise generated by the wheels on the rails – like rail dampeners and resilient wheels – that may also be feasible.

The next steps that Metrolinx will follow in identifying what type of noise mitigation will be implemented and where, include:

1. Further analysis of the noise mitigation options will be undertaken to establish what types of mitigation will be implemented and where. This will include further consideration of the administrative, operational, economic and technical feasibility as per the Protocol.
2. Metrolinx will carry out additional public engagement once Detailed Design has progressed and updated analysis results are available.

5.4.3.2 Vibration

Construction

A Construction Vibration Mitigation and Monitoring Plan will be developed prior to construction. The plan will include a complaint response protocol. The plan may include:

- Where possible, implement a minimum setback distance of 45 m from nearby residences during construction activities to minimize potential annoyance with construction vibration. This would ensure that nearby residences experience vibration levels of less than 0.4 mm/s.
- Where possible, implement a 15 m setback distance between the construction vibration source and nearby buildings. With the 15 m setback distance applied, vibration from construction is not anticipated to affect buildings in the areas surrounding the rail corridor.

Operations

Based on findings from the evaluation of select receptors (see **Table 5-5**), mitigation will be investigated for all receptors within 75 m distance to proposed new switches or other special trackwork or 20-25 m distance to proposed new tracks. The types of mitigation that Metrolinx primarily focuses on are using rubber to help cushion the force of vibration and reducing the amount transmitted into the ground. **Figures 5-7E to 5-7G** show the approximate locations of the vibration mitigation based on Preliminary Design.

Vibration effects were predicted in accordance with the methods of the United States Department of Transportation - Federal Transit Administration (FTA, 2006). Adjustments were made to the FTA calculations to account for Vehicle speed; Track type and track conditions; Type of locomotive power; and Condition of wheels (i.e., wheel wear).

A literature review was conducted to compare the gross weight of a diesel MP40 locomotive and an electric locomotive with a similar horsepower rating. It was determined that the difference in locomotive weight was not significant enough to have an impact on the vibration levels; therefore, the operational vibration assessment of GO trains applies to both diesel trains and electric trains.

Figure 5-7A: Technically Feasible Noise Barriers for Diesel RER and Electric RER



Figure 5-7B: Technically Feasible Noise Barriers for Diesel RER and Electric RER



Figure 5-7C: Technically Feasible Noise Barriers for Diesel RER and Electric RER

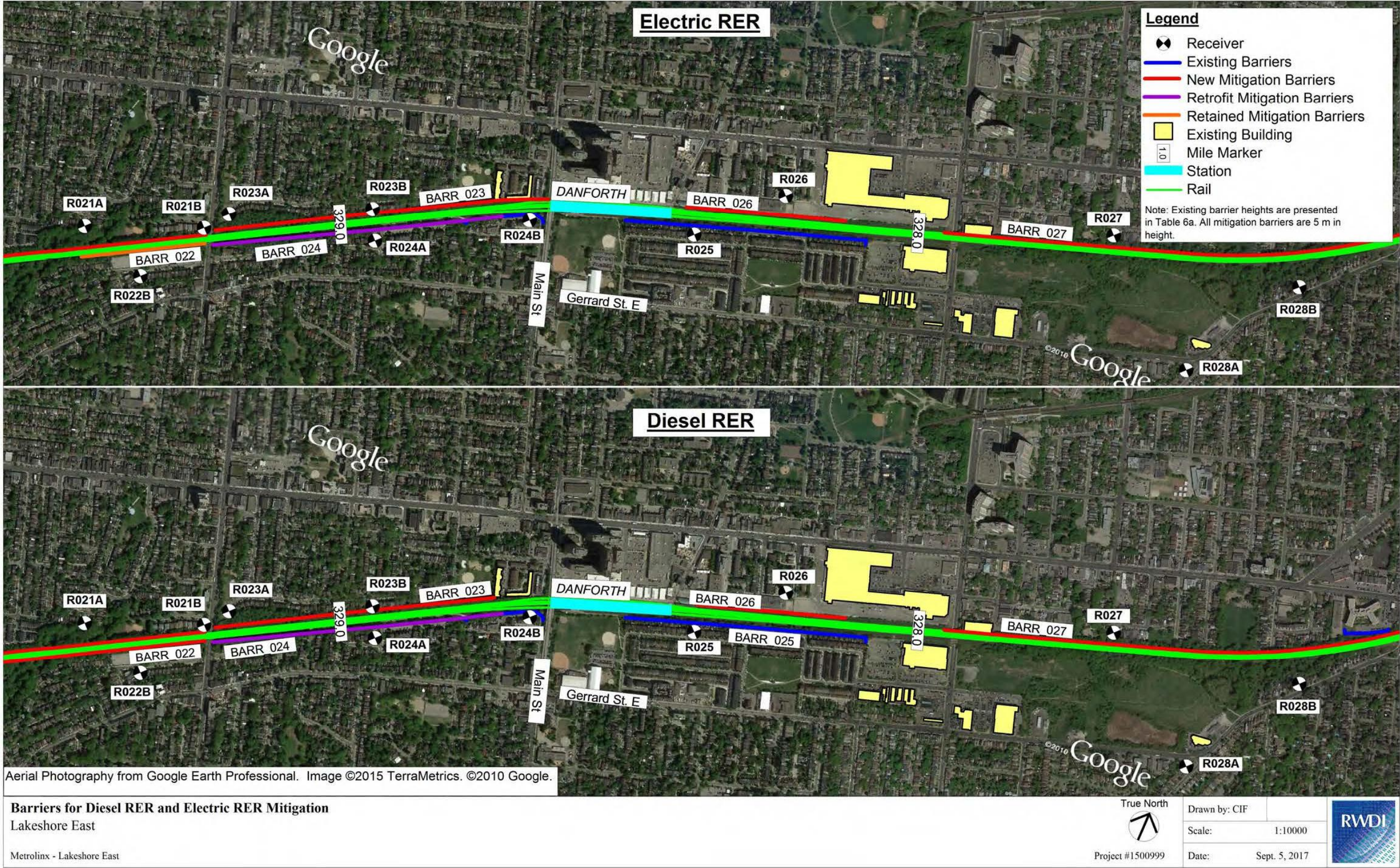


Figure 5-7D: Technically Feasible Noise Barriers for Diesel RER and Electric RER

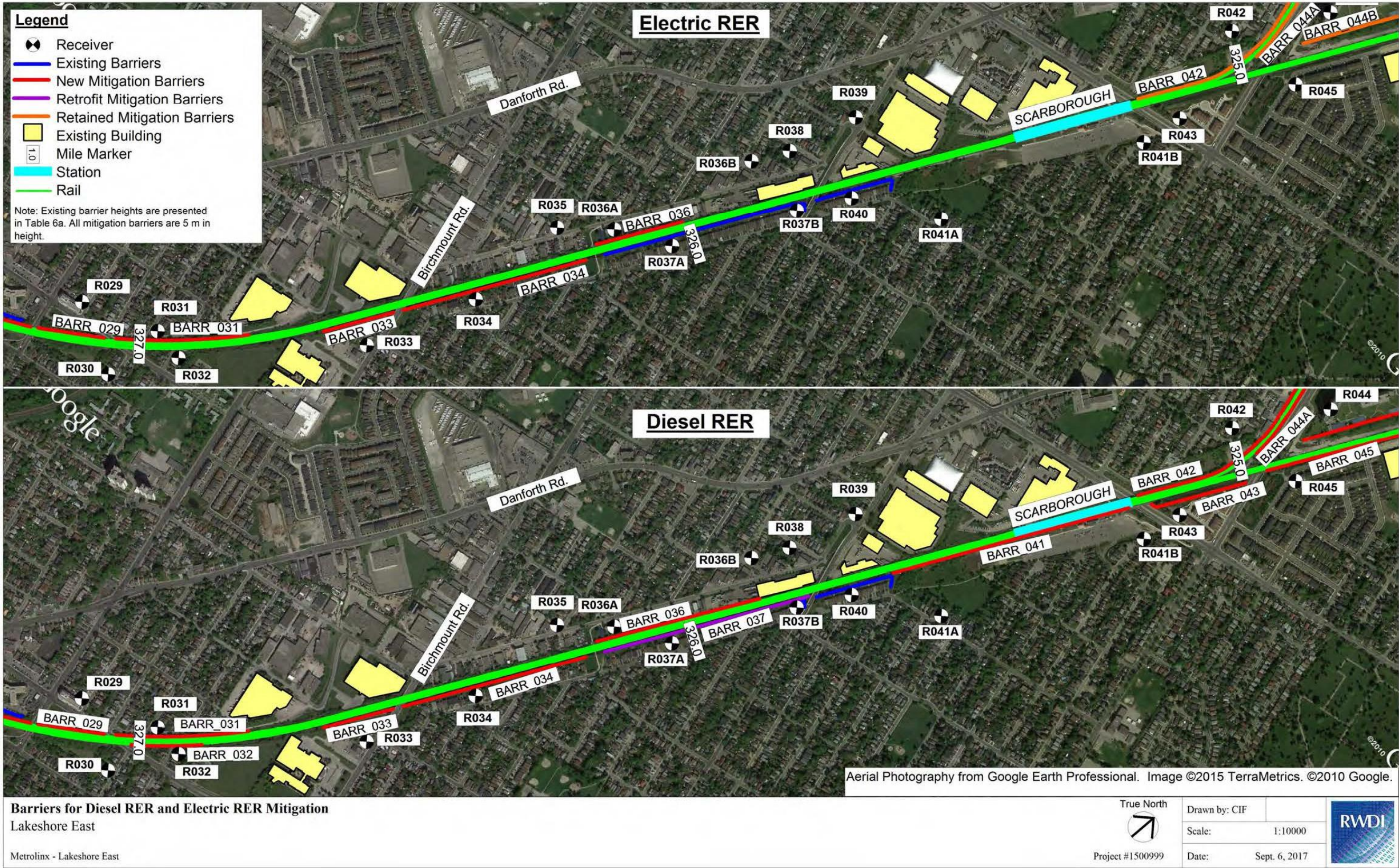


Figure 5-7E: Approximate Locations of Vibration Mitigation

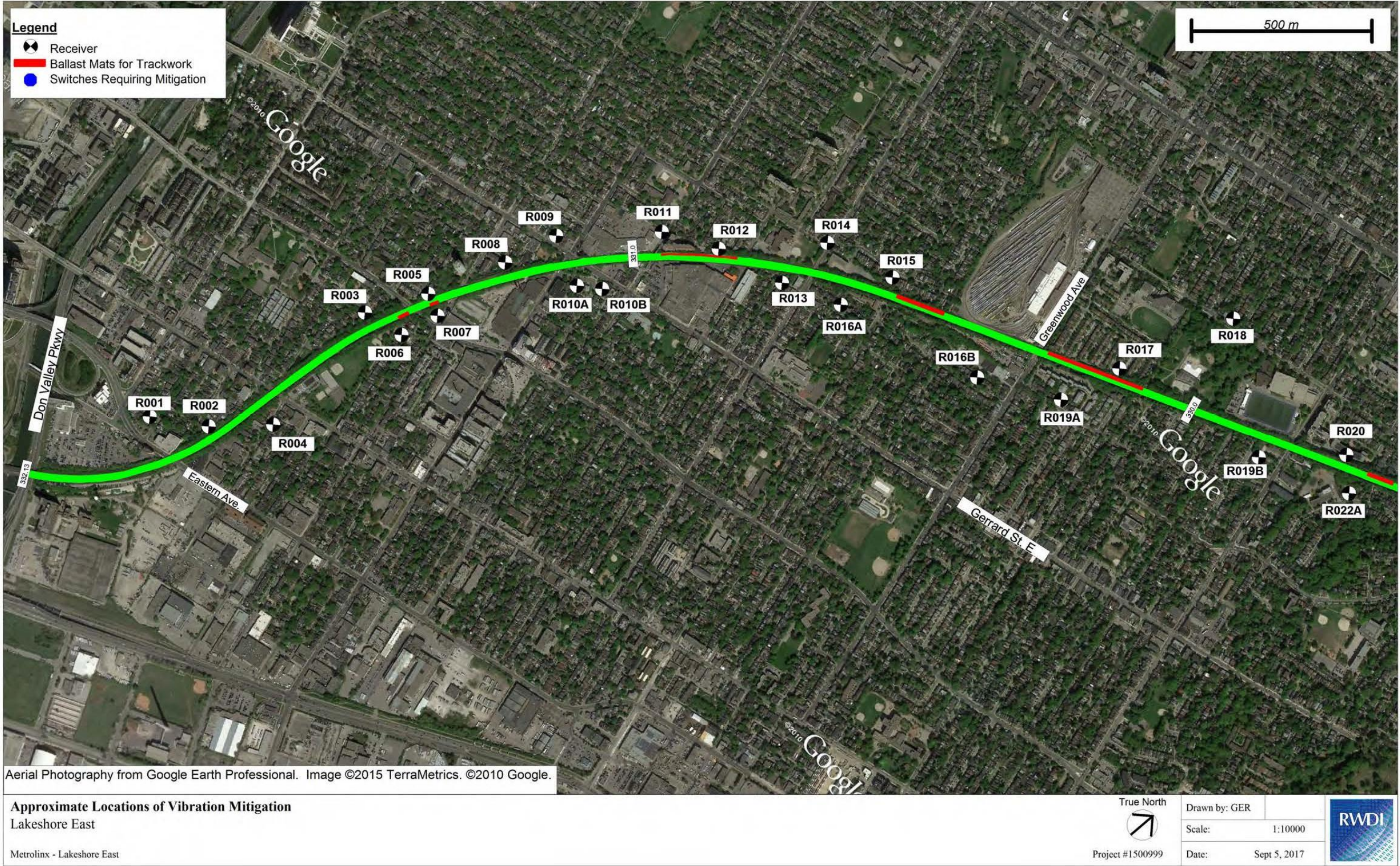


Figure 5-7F: Approximate Locations of Vibration Mitigation

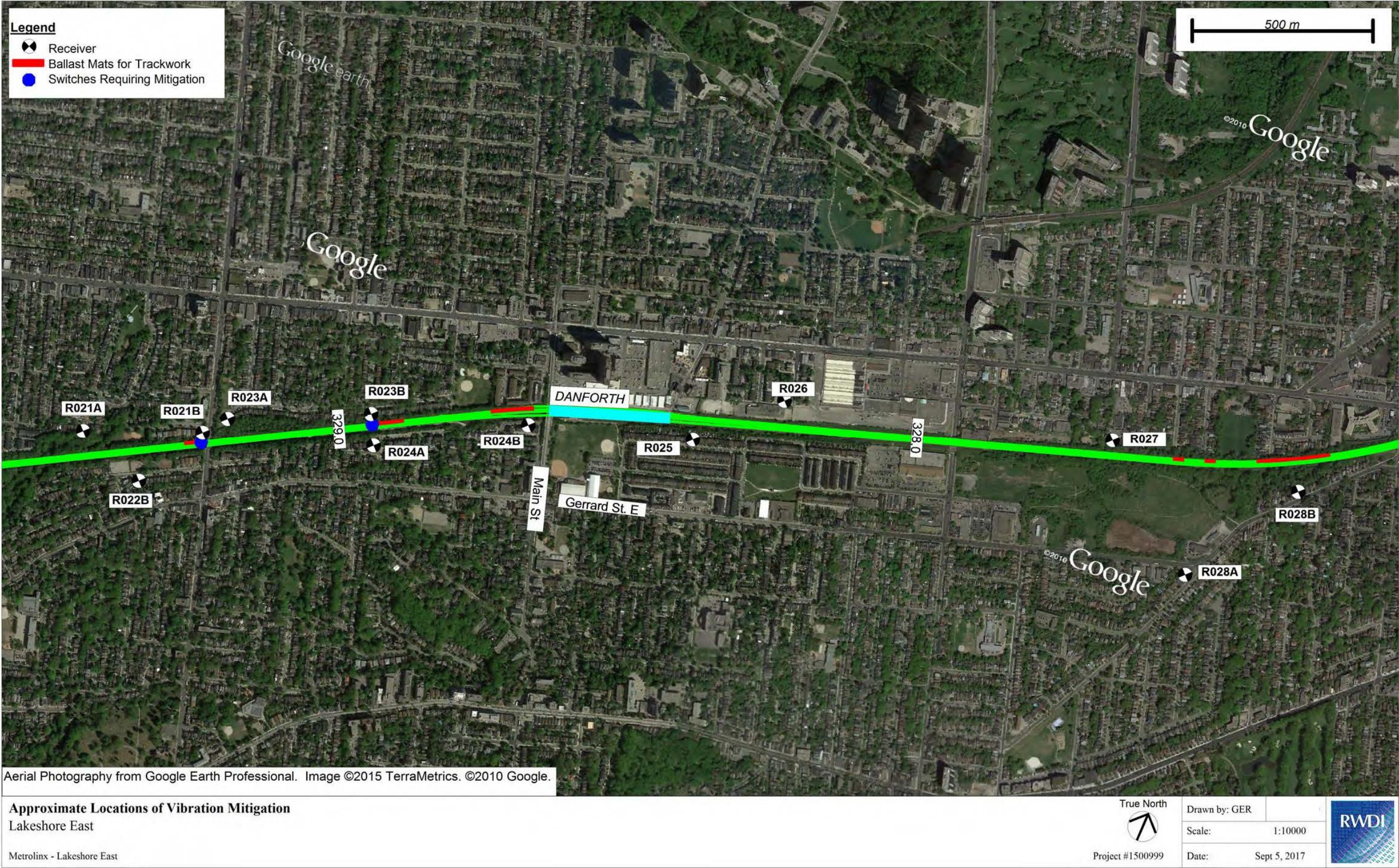
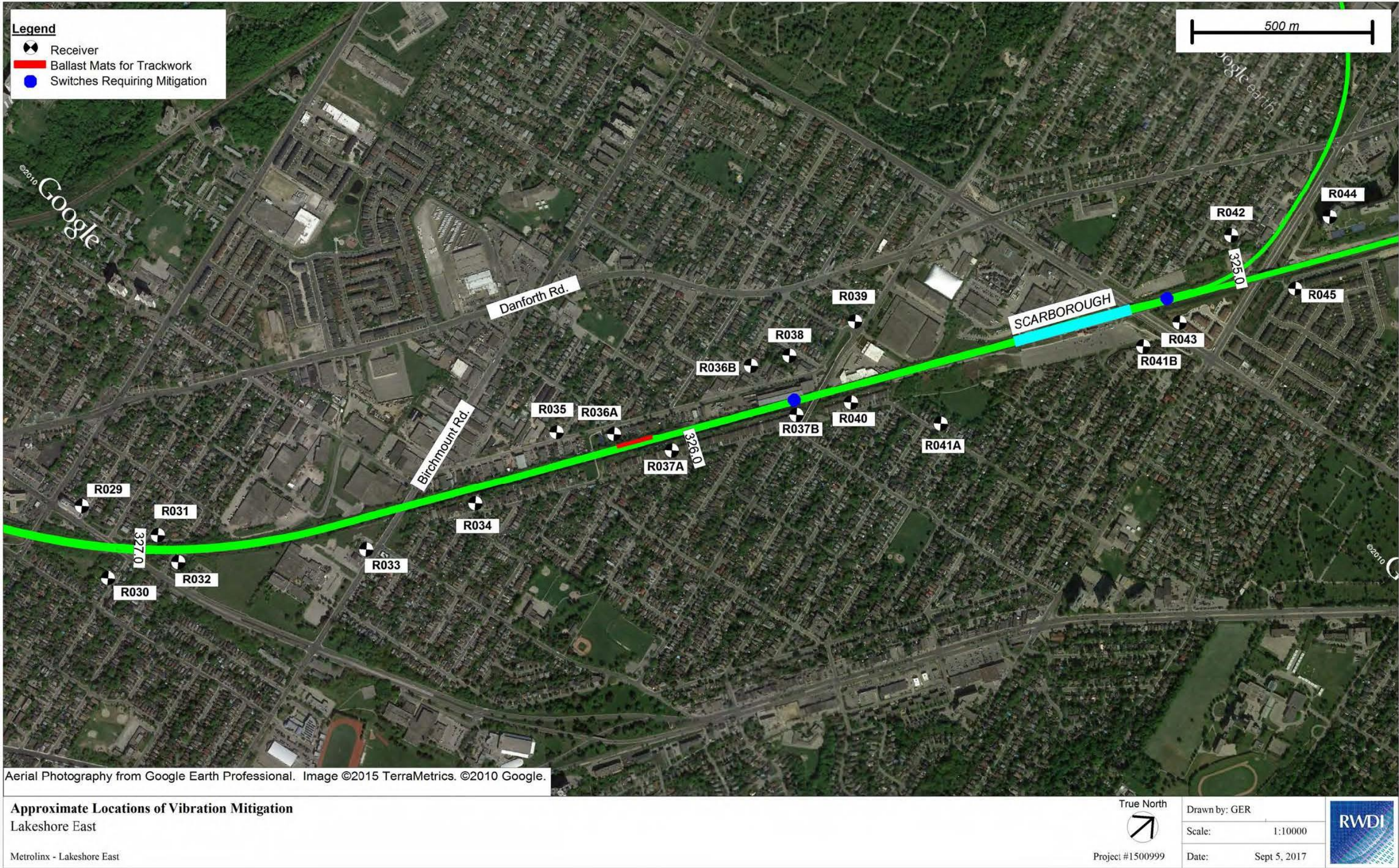


Figure 5-7G: Approximate Locations of Vibration Mitigation



The recommended vibration mitigation is the implementation of ballast mats, however, further analysis of the vibration mitigation options will be undertaken during Detailed Design to establish what types of mitigation will be implemented and where. This will include further consideration of the administrative, operational, economic and technical feasibility. A review of the vibration assessment will be undertaken during Detailed Design and vibration measurements will be completed for new infrastructure at relevant representative locations, as well as a reasonable number of additional representative receptor locations. In addition, new municipal development information will be considered if it is received from municipalities during Detailed Design. The onus will be on the developer to provide mitigation if a substantial amount of design has been completed and can no longer incorporate further changes.

5.5 Socio-Economic and Land Use

For a more detailed discussion of potential effects and mitigation measures relating to the socio-economic environment and land use refer to **Appendix B4**.

5.5.1 Residential, Commercial and Institutional Uses

5.5.1.1 Potential Construction Effects

As discussed in **Section 5.6**, the construction staging conditions implemented at the bridge locations will not have a major effect on the roadway operations with respect to queues. Pedestrian and cyclist operations are expected to be minimally affected during construction.

Residents, businesses and institutions may experience temporary nuisance effects resulting from increased noise and vibration levels due to construction equipment and activities. An effects assessment addressing these issues is provided in the **Section 5.4**.

Temporary traffic delays associated with construction activities may cause disruptions to businesses within the Socio-economic Assessment Area. However, any potential effects to businesses are anticipated to be minimal due to the short-term nature of the effects.

The construction associated with the Project will also result in direct and indirect economic benefits. Construction activities will result in additional employment opportunities, and construction workers will provide some additional revenue opportunities to local businesses with respect to various supplies required and restaurant/food establishments.

5.5.1.2 Potential Operations Effects

No direct physical effects to residential, commercial and institutional uses are anticipated during the operation of the Project.

5.5.1.3 Mitigation

The surrounding community will be notified of construction plans, as well as any modifications to these plans as they occur. Access to all residential, commercial and institutional uses will be maintained at all times, where possible. Where this is not possible, direct consultation will occur with the affected property owners to establish a suitable mitigation strategy. Additional details related to property are discussed under **Section 5.5.5**.

Mitigation measures related to noise are addressed in **Section 5.4**.

Mitigation measures related to traffic and transportation are addressed in **Section 5.6**.

5.5.2 Recreational Uses, Parks and Open Spaces

5.5.2.1 Potential Construction Effects

Pedestrian and cyclist access to recreational uses and parks and open spaces is not anticipated to be impacted during construction. Based on the Preliminary Design, the Lower Don River Trail is not anticipated to be impacted.

Enjoyment of other recreational uses within the Socio-economic Assessment Area may be affected by increased noise and vibration levels and visual aesthetics due to construction equipment and activities. Further details regarding the noise and vibration effects assessment is provided in **Section 5.4** and potential aesthetic effects are discussed further in **Section 5.5.3**.

The addition of the fourth railway track may also result in the need to acquire portions of public parkland, which will be confirmed during Detailed Design.

5.5.2.2 Potential Operations Effects

No direct physical effects to recreational uses are anticipated during operation of the Project.

5.5.2.3 Mitigation

Mitigation measures related to noise are addressed in **Section 5.4**.

Metrolinx is establishing a Vegetation Compensation Protocol for Metrolinx RER projects and vegetation that is removed will be compensated for in accordance with the provisions of this protocol:

- **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 along long stretches of 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 community types/ ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final 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).

At a minimum, safety fencing will be used where necessary to separate the work area from pedestrians and/or cyclists. Signage indicating the presence of construction crews and/or activities will also be utilized. Special directional signage may also be considered as a means to indicate alternative access routes to recreational uses

and parks and open spaces. Additional mitigation measures related to traffic and transportation are addressed in **Section 5.6**.

The City of Toronto will be consulted during Detailed Design regarding works in the vicinity of Small's Creek with a focus on avoiding or mitigating impacts to the newly constructed stairs, boardwalk and slopes.

Construction adjacent to City parks will be avoided between May and September, where feasible, to minimize construction-related disturbance.

If property taking of public parkland is confirmed during Detailed Design, appropriate mitigation will be determined through consultation with the City of Toronto to reduce potential effects.

5.5.3 Aesthetics

5.5.3.1 Potential Construction Effects

Construction activities, including the presence of construction equipment, staging areas and temporary fencing, may also result in undesirable temporary aesthetic effects. Specifically at Warden Avenue and Woodbine Avenue, bridge construction activities may result in temporary obstruction to views and/or degradation of existing murals on the bridge underpass.

Retaining walls will be required in some locations to support the construction of the additional fourth railway track. Preliminary design shows 3.8 km in retaining walls and 2 km of retaining walls will be public facing. Construction of retaining walls required for the Project will result in some tree/vegetation removal. Aesthetic effects of the construction of retaining walls and bridge widenings may include visual impacts which may affect user enjoyment of the following parks:

- Scotia Parkette;
- Oakridge Park;
- Kenworthy Park;
- Merrill Bridge Road Park;
- Woodrow/Raleigh Parkette;
- Elward Mansion Parkette;
- Blake Street Public School;
- Gerrard-Carlaw Parkette;
- Jimmie Simpson Park;
- Blake Street Public School; and,
- North side of Danforth Avenue.

The proposed retaining wall locations are identified in **Appendix A**. Please refer to **Section 3.2.4** for additional information regarding retaining walls.

5.5.3.2 Potential Operations Effects

Public-facing retaining walls may result in permanent visual effects, obstruction of views, and user enjoyment of parks during operations. Accordingly, undesirable aesthetic effects associated with the presence of these structures will continue throughout the operation of the Project.

5.5.3.3 Mitigation

During Detailed Design, property requirements will be further investigated. Where expanding the corridor grade is not feasible, retaining walls will be constructed. The design of significant public facing retaining walls and corridor facing retaining walls that may be notable from a public realm perspective will be reviewed by the Metrolinx Design Review Panel (MDRP).

If existing murals are degraded due to construction, reinstatement/extension of the murals will be co-ordinated with City staff and/or the local Councillor and community as appropriate.

Tree/vegetation removal as a result of this Project will be addressed and compensated through Metrolinx's Vegetation Compensation Protocol. Additional details related to this protocol are provided in **Section 5.5.2.3** above.

5.5.4 Utilities

5.5.4.1 Potential Construction Effects

Potential effects to existing utilities within the Lakeshore East Rail Corridor, including the need for relocation and/or service interruptions to residents and businesses, and associated mitigation measures will be identified as part Detailed Design.

5.5.4.2 Potential Operations Effects

Access to utilities may require temporary access permission (easements) for maintenance activities within the Lakeshore East Rail Corridor. No other effects on utilities are anticipated during the operation of the Project.

5.5.4.3 Mitigation

A review of existing and proposed future utilities plans, as well as ongoing consultation with utility companies, has identified the specific location of utilities within the vicinity of the Lakeshore East Rail Corridor and this consultation will continue to occur during Detailed Design. Any potential conflicts and associated mitigation measures will be identified as part of Detailed Design.

For example, utilities that cross the tracks will be reviewed with the utility owner for any works required to be undertaken to construct the fourth track and grading activities. Co-ordination will occur with each individual utility company during Detailed Design and proper crossing agreements must be agreed to by each utility.

Utilities which run longitudinally along the track will also be reviewed. During Detailed Design, co-ordination with the appropriate utility companies will occur in order to remove or temporarily relocate any utilities which may be impacted by the new fourth track grading.

Once utility conflicts have been specifically identified and resolved, no further mitigation measures related to utilities are required for the operations phase of the Project.

Potential access requirements as a result of maintenance within the Lakeshore East Rail Corridor will be determined in consultation with relevant utility owners.

5.5.5 Property

5.5.5.1 Potential Construction Effects

The majority of the proposed Lakeshore East Rail Corridor expansion utilizes the existing railway lands. In certain sections of the Socio-economic Assessment Area, portions of private properties and public lands will need to be acquired to accommodate the proposed additional track. Specific property requirements will be determined during Detailed Design and discussions with the affected property owners will also be undertaken.

Despite best efforts to minimize property impacts and reduce the property acquisition requirements by utilizing engineering solutions to retain the track structure caused by expansion of the Lakeshore East Rail Corridor during Preliminary Design, engineering solutions were not possible in the following areas:

- At the east-end tie-in where the grade is significantly higher than the adjacent lands to the south side of the corridor. Approximately 942 metres squared (m^2) of additional property will be required in this location in addition to structural retaining walls.
- Property along the north side of the corridor between the Danforth Avenue and Warden Avenue grade separation structures require additional property to be acquired. This is a result of the fourth track centreline impacting the property line. Therefore, a design including a ditch has been provided in this area with the additional property requirements.
- A 421 m^2 area east of Victoria Park Avenue will be required. This is due to the sudden decrease in available land (i.e., the property line shifting closer to the tracks).
- To accommodate the service track (lead into yard) to the east of the Don Valley, approximately 410 m^2 of property is required.

During construction, temporary access permission (easements) may be required.

5.5.5.2 Potential Operations Effects

For temporary access for corridor operations and maintenance activities, agreements with adjacent property owners may be required.

5.5.5.3 Mitigation

Specific property requirements will be determined during Detailed Design. Ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures. Communications with stakeholders to identify local and site-specific issues may include discussions on topics such as:

- Construction access;
- Construction schedule; and,
- Enquiries/complaint procedures.

Effects on adjacent property owners related to construction activities (e.g., noise and vibration, air quality, traffic) will be addressed through the mitigation measures outlined in **Sections 5.3, 5.4 and 5.6**.

A construction monitoring program will be implemented prior to construction, based on the recommended mitigation measures in the Management Plans developed for this Project (e.g., traffic, noise and vibration, stormwater, etc.). If property damage claims are received, a monitoring program may be developed during claim resolution.

Access to individual properties will be maintained during construction.

Specific agreements and communication with the relevant property owners will be undertaken during Detailed Design to address the need for temporary access for corridor operations and maintenance activities.

5.5.6 Planned Land Use

5.5.6.1 Potential Construction Effects

There is potential for construction of interfacing projects to occur during the construction phase of this Project.

5.5.6.2 Potential Operations Effects

The improvements/initiatives of interfacing projects may enhance the outcome of this Project.

5.5.6.3 Mitigation

Metrolinx will co-ordinate with City of Toronto and/or TRCA to consider streamlining construction timelines for efficiency, where feasible.

Metrolinx will co-ordinate with City of Toronto and/or TRCA to ensure the overall intent of the Project is maintained or enhanced.

5.6 Traffic and Transportation

A more detailed assessment of the potential effects associated with traffic and transportation is documented in the Traffic Impact Study in **Appendix B5**.

5.6.1 Potential Construction Effects

Roads and Traffic Volumes

The results of the Traffic Impact Study showed that the potential effects of the bridge widening construction at each of the relevant bridge widening locations⁵ (Woodbine Avenue, Warden Avenue, and Danforth Avenue) will remain local. The construction staging conditions implemented at the bridge locations will not have a major effect on the roadway operations with respect to queues.

The Traffic Impact Study concluded that no capital projects that are currently planned to be implemented up to and including the 2018 horizon year are located in proximity to the construction site locations, and therefore would pose no effect on traffic operations at the rail crossings during the construction period.

Pedestrian and Cycling Routes

Pedestrian and cyclist facilities were assessed in the Traffic Impact Study in order to capture any potential operational impact caused by the construction staging. Following Council approval in 2016, the City of Toronto is implementing future bike lanes on Woodbine Avenue with construction scheduled to begin in 2017. Under the staging conditions at the Woodbine Avenue road-rail bridge crossing, as well as the other bridge widening locations, pedestrian and cyclist operations are expected to be marginally impacted during construction.

5. Bridge widening is also proposed under the Birchmount Road Bridge; however, that bridge carries road over rail and impacts to road traffic are not anticipated.

Public Transit Service

Figure 5-8 provides map of all TTC routes servicing the Traffic Impact Study Assessment Area. As can be identified from the map, the four routes listed below were found to travel directly through the planned staging areas for the bridge widenings, and will therefore be affected by construction effects:

- 20 Cliffside;
- 69A Warden;
- 92 Woodbine; and,
- 135 Gerrard.

Figure 5-8: TTC Routes within the Study Area



TTC Route 20 runs along the section of Danforth Avenue crossing under Lakeshore East Rail Corridor and may be potentially affected by the construction works. The speed limit on Danforth Avenue is 50 km/h and pedestrian facilities exist on both the north and south sides of the road in the form of sidewalks.

There is the potential for temporary effects to TTC Routes 69A and 135 along Warden Avenue during construction of the bridge widening. Construction staging conditions implemented at the bridge locations will not have a major effect on the roadway operations with respect to queues.

TTC Route 92 runs along Woodbine Avenue, including the underpass. The City has plans to implement bike lanes along Woodbine Avenue and may be affected by the construction works.

The above-noted TTC routes should not be substantially affected, with the possible exception of experiencing a slight delay travelling through construction staging areas. None of the road-rail bridge crossings are planned for closure, therefore no diversions will be required for the above-noted routes.

In order to determine the potential number of passengers affected by the staging delay, service frequency, and peak ridership data for the four routes were reviewed. **Table 5-6** summarizes the findings for the routes. Note that “peak load ridership” represents the highest average number of passengers on the buses travelling through the staging areas over the TTC’s five operating periods during a weekday.

Table 5-6: Service Frequency and Ridership for Potentially Impacted TTC Routes

TTC Route	Frequency				Peak Load Ridership (Passengers per Bus Trip)
	Weekday		Weekend		
	Peak Period of Service	Off-Peak Period of Service	Peak Period of Service	Off-Peak Period of Service	
20 Cliffside	11 Minutes	17 Minutes	18 Minutes	20 Minutes	25.2
69A Warden	11 Minutes	16 Minutes	20 Minutes	20 Minutes	10.6
92 Woodbine	9 Minutes	12 Minutes	12 Minutes	12 Minutes	24.6
135 Gerrard	20 Minutes	20 Minutes	20 Minutes	30 Minutes	9.2

5.6.2 Potential Operations Effects

No effects to roads and traffic volumes, public transit, or pedestrian or cycling routes are anticipated during the operational phases of the Project.

5.6.3 Mitigation

Potential effects to pedestrian and cycling activities during construction will be mitigated through the installation of appropriate way-finding, regulatory, and warning signs. It is recommended that the temporary construction staging is implemented according to OTM Book 7 on Temporary Conditions.

The TTC will be engaged through construction meetings and advance notification of construction works will help TTC to determine if extra service, or service modification, is required.

Metrolinx will co-ordinate with the City, TTC and other relevant organizations to consider and address projects proposed beyond 2018. For additional information please refer to **Section 8.2.4**.

No further mitigation measures are required during operations as no effects are anticipated.

5.7 Cultural Heritage

5.7.1 Potential Effects

The CHSR provided in **Appendix B6a** recommended a CHER be completed for thirteen (13) Built Heritage Resources. As part of the evaluation, it was determined that two (2) of the potential heritage properties were identified to have potential direct impacts and eleven (11) potential heritage properties were identified to have potential indirect impacts (see **Table 5-7**).

Through the CHER process, any property within the Study Area that may be identified as a Provincial Heritage Property will be reviewed to identify if further heritage assessment studies are required. If a Provincial Heritage Property is identified and is contemplated for removal, demolition or transfer from provincial control, Metrolinx will engage MTCS to gain feedback and to initiate an HIA. This will be determined after the review and approval of the Metrolinx Heritage Committee.

CHERS for the two (2) potentially directly impacted properties, Carlaw Avenue Subway and Gerrard Street East Subway, have been completed as part of this TPAP and are provided in **Appendix B6b**. Carlaw Avenue Subway and Gerrard Street East Subway met the criteria in *O. Reg. 9/06* and have been identified as Provincial Heritage Properties. Although the effects of the project are not expected to be negative, HIAs are recommended for these properties. CHERS for the remaining eleven (11) potentially indirectly impacted properties will be completed during Detailed Design.

The CHSR also recommended a Heritage Impact Assessment (HIA) be conducted for the two (2) identified HCDs, the Designated Riverdale HCD and the Proposed Queen Street East HCD. An HIA to include Carlaw Avenue Subway, Gerrard Street East Subway, the Designated Riverdale HCD and the Proposed Queen Street East HCD will be completed during Detailed Design.

5.7.2 Mitigation

CHERS for the directly impacted properties have been completed and provided to MTCS. CHERS for indirectly impacted properties will be finalized during Detailed Design and provided to MTCS.

As noted above, HIAs will be completed during Detailed Design for any Provincial Heritage properties identified through the CHER process upon MHC determination, including Carlaw Avenue Subway and Gerrard Street East Subway. In addition, the CHSR recommended HIAs be completed for Designated Riverdale HCD and Proposed Queen Street HCD. These HIAs will inform appropriate mitigation measures for each specific heritage attribute. HIAs will be provided to MTCS by Metrolinx.

Consultation with MTCS and/or the City of Toronto will be completed as appropriate to inform mitigation.

Table 5-7: CHER Summary

Resource Name / Address	Heritage Resource Category	CHSR Outcome	CHER Recommendations	Direct or Indirect Impact	CHER Outcome (MHC Decision)
Lakeshore East Rail Corridor	CHL 1	Is not considered a Potential Provincial Heritage Landscape	No CHER required. AECOM prepared a standalone report documenting the background and history of the corridor	N/A	N/A
Don River Bridge	BHR 1	Is considered a Potential Provincial Heritage Property	CHER required	Indirect	Not a Metrolinx Heritage Property
Eastern Avenue Subway	BHR 2	Is considered a Potential Provincial Heritage Property	CHER required	Indirect	Not a Metrolinx Heritage Property
60 and 62 McGee Street	BHR 3	Are considered a Conditional Heritage Property	CHER required	Indirect	Narrow portion of property acquired does not contain any heritage attributes
Queen Street East Subway	BHR 4	Is considered a Potential Provincial Heritage Property	CHER required	Indirect	Not a Metrolinx Heritage Property
6, 8 and 10	BHR 5	Are considered a Conditional	CHER required	Indirect	Narrow portion of

Table 5-7: CHER Summary

Resource Name / Address	Heritage Resource Category	CHSR Outcome	CHER Recommendations	Direct or Indirect Impact	CHER Outcome (MHC Decision)
Paisley Avenue		Heritage Property			property acquired does not contain any heritage attributes
15 and 17 Tiverton Avenue	BHR 8	Are considered a Conditional Heritage Property	CHER required	Indirect	Narrow portion of property acquired does not contain any heritage attributes
Carlaw Avenue Subway	BHR 13	Is considered a Potential Provincial Heritage Property	CHER required	Direct	Metrolinx Heritage Property Meets criteria in O. Reg. 9/06 Property is a PHP
Gerrard Street East Subway	BHR 14	Is considered a Potential Provincial Heritage Property	CHER required	Direct	Metrolinx Heritage Property Meets criteria in O. Reg. 9/06 Property is a PHP
Pape Avenue Pedestrian Overpass	BHR 15	Is considered a Potential Provincial Heritage Property	CHER required	Indirect	Not a Metrolinx Heritage Property
Coxwell Avenue Subway	BHR 19	Is considered a Potential Provincial Heritage Property	CHER required	Indirect	Not a Metrolinx Heritage Property
Victoria Park Avenue Subway	BHR 22	Is considered a Potential Provincial Heritage Property	CHER required	Indirect	Not a Metrolinx Heritage Property
Danforth Avenue Subway	BHR 24	Is considered a Potential Provincial Heritage Property	CHER required	Indirect	Not a Metrolinx Heritage Property
Birchmount Road Overpass	BHR 25	Is considered a Potential Provincial Heritage Property	CHER required	Indirect	Not a Metrolinx Heritage Property
Riverdale Heritage Conservation District	--	Is a Designated Heritage Conservation District (OHA pt V)	Heritage Impact Assessment Required	Indirect	Metrolinx Heritage Property
Proposed Queen Street East Heritage Conservation District	--	Is a Proposed Heritage District (OHA pt V)	Heritage Impact Assessment Required	Indirect	Metrolinx Heritage Property

5.8 Archaeology

5.8.1 Potential Effects

As described in **Section 4.8.2**, a Stage 1 AA was carried out for the Study Area, and was submitted to MTCS in accordance with Section 65 of the *Ontario Heritage Act*.

The findings of the Stage 1 AA (see **Appendix B7**) determined that the Study Area retains the potential for archaeological discoveries in certain areas. Therefore, a Stage 2 AA will be completed on any lands that will be impacted by the Project if it is shown as retaining potential for archaeological resources (see **Figures 4-7A** and **4-7B**).

5.8.2 Mitigation

As the Stage 1 AA was completed through desktop review, some areas identified as retaining archaeological potential may be screened out based on site conditions observed during the Stage 2 AA field reconnaissance.

If required for lands being impacted by the Project, a Stage 2 AA will be undertaken for areas that cannot be visually determined to be previously disturbed, poorly drained or steeply sloped and shall involve a property survey by the standard test pit assessment method at an interval of 5 m. Test pits that are a shovel width in diameter will be excavated 5 mm into subsoil with all soil screened through 6 mm aperture hardware cloth and all cultural material collected for analysis.

If land that requires a Stage 2 AA is found to be previously disturbed, steeply sloped or poorly drained, photographic documentation of the conditions is all that is required.

Should the proposed work extend beyond the Study Area, the Stage 1 AA must be revised to determine the archaeological potential and requirement for further Stage 2 AA work of any additional lands.

Should previously unknown or unassessed deeply buried archaeological resources be uncovered during construction activities, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological field work, in compliance with Section 48 (1) of the *Ontario Heritage Act*. Any person discovering human remains must immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government Services. In addition, consultation with relevant Indigenous communities will be initiated in the event that archaeological resources or human remains are discovered.

6. Climate Change and Sustainability

Climate change is defined as any significant change in long-term weather patterns. The term can apply to any major variation in temperature, wind patterns or precipitation that occurs over time. Global warming describes the recent rise in the average global temperature caused by increased concentrations of greenhouse gases (GHGs) trapped in the atmosphere. Scientists have concluded that human activity is largely responsible for recently observed changes to our climate since GHGs are mainly caused by burning fossil fuels to produce energy.

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.

In addition, the MOECC has developed a Climate Change Strategy (MOECC, 2016), which outlines the five areas that Ontario will focus on in order to achieve the GHG reduction targets including:

1. A prosperous low-carbon economy with world-leading innovation, science and technology;
2. Government collaboration and leadership;
3. A resource-efficient, high-productivity society;
4. Reducing GHG emissions across key sectors; and
5. Adaptation and risk awareness.

As an agency of the Government of Ontario, Metrolinx has prioritized achieving progress towards sustainability (Metrolinx 2014) which is in alignment with the MOECC Climate Change Strategy. Metrolinx has developed a Five Year Strategy 2015-2020 that outlines priorities and objectives that provide a framework to guide work in all parts of the organization as the implementation of the regional transportation plan is lead through an extensive program of tangible deliverables. Metrolinx's Strategy includes International Association of Public Transport (UITP) and American Public Transportation Association (APTA) sustainability commitments. These associations aim to enhance quality of life and promote sustainable transportation in urban areas. Both of these programs support becoming more sustainable by following a framework of requirements and measuring progress year over year. Deliverables listed in the Five Year Strategy include:

- Establish an executive-sponsored corporate Sustainability Framework by 2015, addressing energy use, emissions and environmental management, and develop and implement work plans and supporting policies for priority initiatives.
- Attain APTA Sustainability Commitment Gold status by 2017 and UITP Sustainability Charter Full Signatory status by 2016.
- Establish a corporate Climate Adaptation Plan covering facilities, practices and protocols, by 2018.
- Introduce cleaner twin-engine Tier 4 locomotives to the GO Transit fleet in 2016, beginning an ongoing conversion program.

6.1 Potential Effects of Climate Change on the Project

It is recognized that climate change is already underway and that extreme weather is affecting the GTHA and the operation and maintenance of the Project. Past risk and vulnerability studies and work done in the GTHA and in other areas indicate that the following are some of the key climate change and severe weather effects that may need to be considered for the Project:

- Higher average temperatures and higher average minimum and maximum temperatures;

- Extreme/intense rain and flooding;
- Ice storms/freezing rain;
- Lightning strikes and severe winds; and
- Faster tree growth with potentially higher rates of disease and pest conditions.

Projected changes in extreme weather conditions may be of particular concern in assessing the potential future climate change implications for the future electrification of the Lakeshore East Rail Corridor and enhanced resiliency shall be considered. Continuous changes in weather may require ongoing monitoring and adaptation.

Some of the potential future climate/weather effects that may warrant steps to reduce vulnerability and enhance resiliency and ongoing adaptive capacity include, but are not limited to:

- Exceedance of storm sewer/culvert and overland flow system capacities resulting in flooding;
- Scour and damage to or failure of culverts, bridges or embankment side slopes;
- Ice accumulation affecting infrastructure and equipment;
- High winds could result in damage to OCS structures;
- Potentially higher rates of downed trees along the perimeter of rail corridors or affecting any project components causing power outages or damage; and,
- Potentially higher rates of tree maintenance along the perimeter of corridors or affecting any project components.

Modifications to Project design/design solutions may be appropriate to reduce vulnerability to changes in some of the above-noted climate/weather parameters. Potential adaptations to deal with changing climate conditions may include the following:

- Extreme/intense rain and flooding:
 - Review/modify floodplain/storm frequency design criteria and implement Stormwater Management Plan during construction/operation;
 - Build flood protection structures and elevate assets to keep from flooding;
 - Redirect storm runoff from track bed;
 - Slope stabilization to prevent washouts; and,
 - Erosion and sediment control (ESC) measures will be implemented during the construction phase of the Project to ensure stormwater runoff is not laden with sediment.
- Increased ice accumulation:
 - Provide structural reinforcement for overhead structures to protect against ice accumulation;
 - Bury sections of wire to protect from ice accumulation, where possible;
 - Use remotely operated vehicle for ice removal from critical sections of overhead wires;
 - Apply current which heats wire to melt ice from wires; and,
 - Apply protective coating to prevent ice from accumulating on the surface.
- Faster tree growth with potentially higher rates of disease and pest conditions:
 - Increased tree maintenance along the perimeter of corridors or affecting any Project components.

Upon future electrification of the Lakeshore East Rail Corridor, Metrolinx will also follow the mitigation measures identified as part of the Electrification Project.

6.2 Sustainability

Investment in sustainability transportation is a key part of Ontario's 2015 Climate Strategy to address climate change and is anticipated to bring significant benefits including reduced GHG emissions and "carbon footprint". The Big Move (2008) Regional Transportation Plan for the GTHA highlights Metrolinx's GO Network Electrification as a key climate change mitigation measure that will contribute to Ontario's achievement of its GHG/carbon dioxide equivalent (CO_{2e}) emission reduction targets.

While the future electrification of the Lakeshore East Rail Corridor is anticipated to result in a significant reduction in GHG emissions rather than continuing to operate using diesel-powered rolling stock, the Lakeshore East Rail Corridor will continue to produce GHG emissions over its life cycle. Given the contribution over time, opportunities to further reduce GHG emissions may be considered. Key recommendations based on the APTA Transit Sustainability Guidelines related to infrastructure and facilities may be further reviewed and considered if appropriate/feasible to include:

- Select materials with low embodied energy (i.e., local, recycled, recyclable) as long as transit-specific requirements are also met (i.e., longevity, durability, low maintenance);
- Incorporate innovative sustainable construction practices;
- Set targets for construction and demolition debris diversion from landfill through on-site and off-site reuse and recycling;
- Incorporate environmentally preferable materials and prioritize their acquisition/use based on key attributes (i.e., recyclability, weight, carbon footprint, etc.); and,
- Implement a sustainable procurement policy and/or supply chain policy based on comprehensive sustainability principles.

Upon future electrification of the Lakeshore East Rail Corridor, Metrolinx will also apply the sustainability adaptations identified as part of the Electrification Project, including the effects of high heat on the OCS and its structures (i.e., traction power substations).

7. Consultation Process

In accordance with Section 8 of *O. Reg. 231/08*, this section summarizes the consultation activities carried out with the public, property owners, review agencies, Indigenous communities and other stakeholders during the course of the Project, including a summary of feedback and comments received and how they were considered. A Project Mailing List was continually updated in response to Project feedback and was utilized to inform stakeholders of key consultation milestones.

7.1 Consultation Activities

Metrolinx offered a wide range of communication methods to the general public, review agencies, property owners, Indigenous communities and other interested groups and carried out the following activities to solicit comments and feedback on the Project; the feedback received over the course of the Project was used to inform the direction of the Project, as appropriate:

- Project Website
- Stakeholder Meetings
- Meetings With Elected Officials
- Public Meetings
- Notifications/Newspaper Advertisements
- Agency E-mail distribution list
- Project e-mail Distribution List
- Mailings

7.1.1 Project Website

The Project Website (www.metrolinx.com/DonRiverScarborough) was implemented and dedicated to keep the public up-to-date on the latest developments of the Project, provide notice of Public Meetings held in November 2016 and June 2017, serve as a virtual library for materials presented at Public Meetings and other Project documentation, and provided a means for the public to comment on the Project.

7.1.2 Stakeholder Meetings

Metrolinx consulted with stakeholders, including provincial and municipal review agencies, Indigenous communities, adjacent property owners and community groups, through meetings held during the Pre-TPAP and TPAP phases of the Project. In addition, individual briefings were held with City Councillors and elected officials to provide progress updates related to their specific Project interests.

7.1.3 Public Meetings

7.1.3.1 Public Meeting #1

During the Pre-TPAP phase of the Project, Public Meeting (PM) #1 was held over three (3) sessions in November 2016 in an open house format, complete with a presentation and Question and Answer (Q&A) period, as well as two 30-minute workshop rotations designed to present and seek feedback on noise and vibration issues and mitigation strategies, and tree removal processes and compensation strategies. Metrolinx staff members and its Consultant were in attendance in order to receive feedback and answer questions from participants. The first session was held on November 7, 2016 at Hope United Church - 2550 Danforth Avenue from 6:30 PM to 9:00 PM. The second session was held on November 16 at Riverdale Collegiate Institute - 1094 Gerrard Street East from 6:30 PM to 9:00 PM. The third session was held on November 17, 2016 at Birchmount Park Collegiate Institute -

3663 Danforth Avenue from 6:30 PM to 9:00 PM. In addition, all three (3) sessions co-ordinated with and presented information regarding Electrification and other Metrolinx undertakings relevant to the local community.

Consultation materials developed in association with Public Meeting #1 are included in **Appendices C1 to C3**.

Notification for PM #1 was accomplished through the following:

- Posting on the project website on October 27, 2016
- Publication in the following newspapers:
 - Beach Mirror – October 27, 2016
 - East York Mirror – October 27, 2016
 - Riverdale Mirror – October 27, 2016
 - Scarborough Mirror – October 27 and November 3, 2016
 - Toronto Star - October 27, 2016
 - Toronto L'Express – November 1, 2016
- Sent notification for PM#1 to the following during the week of October 24, 2016:
 - Properties within approximately 30 m of the study area via addressed mail
 - Properties between 30 m to 200 m via unaddressed admail
 - Indigenous communities via e-mail and addressed mail
 - All federal, provincial, and municipal agencies, and other interested stakeholders on the Project Mailing List via e-mail.

The following information was presented at PM #1:

- Background information about Metrolinx and RER;
- Description of the Projects (Lakeshore East Corridor Expansion Don River to Scarborough GO Station and Electrification);
- How the planning process will proceed under the TPAP for both the Lakeshore East Corridor Expansion (Don River to Scarborough GO Station) and Electrification;
- Description of the potential effects (including natural, socio-economic and cultural environments, and bridge modifications), how they would be assessed and potential mitigation measures;
- Community Concerns (aesthetics, tree/vegetation removals, noise and vibration, safety and construction impacts); and
- Project Schedule and Next Steps.

Presentation materials were made available for public viewing on the project website and comments were received until December 14, 2016.

- Session #1: November 7, 2016 - Hope United Church
Approximately 65 people attended the first of three sessions starting on November 7, 2017. In total, 5 feedback forms were received from this meeting.
- Session #2: November 16, 2016 – Riverdale Collegiate Institute
Approximately 51 people attended the second session held at Riverdale Collegiate Institute. In total, 3 feedback forms were received from this meeting.
- Session #3: November 17, 2016 – Birchmount Park Collegiate Institute
Approximately 16 people attended the third session held at Birchmount Park Collegiate Institute. In total, 1 feedback form was received from this meeting.

All public comments received at each of the three sessions are included in the PM #1 Summary Report (**Appendix C3**).

A number of common themes, as important considerations for the project, were identified by participants at all three sessions. These themes included:

- Improved communication and consideration of community input;
- Need for long-term rail infrastructure planning;
- Noise and vibration;
- Tree protection;
- Reducing visual impacts

The sections below summarize the common themes of the public comments received.

Improve Communication

Participants requested details of the construction schedule as early as possible, as well as notification of any changes to this schedule as quickly as possible. It was also requested that a dedicated Communications staff person be identified to contact when work is disruptive at night time. There was a further request for the establishment of a construction liaison committee with residents.

Plan for Long Term

Participants requested that Metrolinx look as far into the future as possible when making infrastructure planning decisions. They also noted that local transit is an important link in the regional transit network.

Noise and Vibration Concerns and Suggestions

Participants requested that Metrolinx go above and beyond the minimum requirements for noise and vibration mitigation. It was also suggested that more emphasis be placed on the impact of peak noise levels, not just the average noise over the course of the day. Participants were particularly interested in the psychological impacts of increased service. One of the recommendations received was to create green noise walls to improve their appearance.

Tree Protection

Participants noted that maintaining trees along the corridor is just as important as planting new trees; they need to be able to survive. It was also noted that controlling invasive species is important. Other suggestions included that Metrolinx partner with community agencies to water and care for young trees, as well as plant trees along noise barriers to act as an additional acoustic barrier to noise caused by rail traffic.

Reducing Visual Impacts

Participants were particularly concerned with the prevention of graffiti on noise walls. It was suggested that prevention could be facilitated by planting vines on noise walls or creating interesting designs as visual screens.

7.1.3.2 Public Meeting #2

During the TPAP phase of the Project, Public Meeting (PM) #2 was held over three (3) sessions in June 2017 in an open house format, complete with a presentation and Question and Answer (Q&A) period and discussions over roll plans of the study area. Metrolinx staff members and its Consultant were in attendance in order to receive feedback and answer questions from participants. The first session was held on June 6, 2017 at John A. Leslie Public School - 459 Midland Avenue from 6:30 PM to 8:30 PM. The second session was held on June 8, 2017 at Riverdale

Collegiate Institute - 1094 Gerrard Street East from 6:30 PM to 8:30 PM. The third session was held on June 15, 2017 at Hope United Church - 2550 Danforth Avenue from 6:30 PM to 8:30 PM. In addition, all three (3) sessions co-ordinated with and presented information regarding Electrification and other Metrolinx undertakings relevant to the local community, including the Danforth GO Station Connectivity Study.

Consultation materials developed in association with Public Meeting #2 are included in **Appendices C1 to C3**.

Notification for PM #2 was accomplished through the following:

- Posting on the project website on May 18, 2017;
- Publication in the following newspapers:
 - Beach Mirror – May 25, 2017
 - East York Mirror – May 18 and 25, 2017
 - Riverdale Mirror – May 18 and 25, 2017
 - Scarborough Mirror – May 18 and 25, 2017
- Sent notification for PM#2 to the following groups during the week of May 15, 2017:
 - Properties within approximately 30 m of the Study Area via addressed mail
 - Properties between 30 m to 200 m via unaddressed admail
 - Indigenous communities via e-mail and addressed mail
 - All federal, provincial, and municipal agencies, and other interested stakeholders on the Project Mailing List via e-mail.

Building upon the information presented at PM #1, the following information was presented at PM #2:

- Update on the description of the Projects (Lakeshore East Corridor Expansion Don River to Scarborough GO Station and Electrification);
- TPAP Process;
- Results of the results of the environmental studies (i.e., natural environment, noise and vibration, air quality, socio-economic, traffic, cultural heritage and archaeology), and bridge modifications, how they have been assessed and proposed mitigation measures;
- Information on the Danforth GO Station Connectivity Study; and
- Project Schedule and Next Steps

Presentation materials were made available for public viewing on the project website and comments were received until July 10, 2017.

- Session #1: June 6, 2017 – John A. Leslie Public School
Approximately 20 people attended the first of three sessions starting on June 6, 2017.
- Session #2: June 8, 2017 – Riverdale Collegiate Institute
Approximately 36 people attended the second session held at Riverdale Collegiate Institute.
- Session #3: June 15, 2017 – Hope United Church
Approximately 65 people attended the third session held at Hope United Church.

A total of 22 feedback forms were received from the three sessions. All public comments received at each of the three sessions are included in the PM #2 Summary Report (**Appendix C3**).

A number of common themes, as important considerations for the project, were identified by participants at all three sessions. These themes included:

- Noise and vibration;

- Reducing visual impacts;
- Safety
- Impacts to the Natural Environment

The sections below summarize the common themes of the public comments received.

Noise and Vibration Concerns During Construction and Operation

Participants noted concerns about noise and vibration impacts on quality of life from increased frequency of service during operations and requested clarification of the frequency of passing trains during peak hours. Concerns were also noted with noise and vibration levels caused by night-time construction. A lack of sound barriers for residential areas, particularly in older areas, was received as a primary concern to many participants. Similar to comments received at PM #1, it was requested that Metrolinx go above and beyond the minimum requirements for noise and vibration mitigation. It was also suggested that more emphasis be placed on the impact of peak noise levels, not just the average noise over the course of the day, as well as consideration for “human impact” (i.e., stress, anxiety, hearing loss) caused by increased noise and vibration levels.

Reducing Visual Impacts

Participants were particularly interested in the visual impact of infrastructure associated with the expansion of the corridor including noise walls, overhead catenary service (electrification infrastructure) and retaining walls. As noted during PM #1, preventing graffiti on new noise walls was received as a major concern.

Safety

Participants were particularly concerned with increasing safety along the corridor, including installation of fencing to prevent access to the tracks.

Impacts to the Natural Environment

Participants noted a general concern regarding impacts to wildlife, as well as the removal of trees and vegetation within adjacent parkland as a result of the rail corridor expansion.

7.1.4 Notice of Commencement

The Notice of Commencement (combined with notification for PM #2) was issued to the public on May 18, 2017, and was published in local newspapers identified in **Section 7.1.3.2** above (also see **Appendix C2**). The Notice of Commencement was also posted to the Project website and at the Danforth and Scarborough GO Stations from May 18, 2017 until June 15, 2017.

To reach the online audience, social media posts on Metrolinx and GO Transit Facebook pages and Twitter accounts (@Metrolinx, @MetrolinxFR, @GOTransit and @GOTransitFR) were posted on May 18, 2017.

Stakeholders (government review agencies, Indigenous communities and property owners on the Project Mailing List) and attendees of PM #1 were sent notification of the Notice of Commencement via e-mail, where available. Property owners within 30 m of the Study Area and Indigenous communities were sent addressed mail while property owners between 30 m to 200 m were sent unaddressed admail, as noted in **Section 7.1.3.2** above.

7.1.5 Circulation of Draft Environmental Project Report

The Draft EPR was circulated to the following review agencies and stakeholders:

- City of Toronto (Technical Advisory Committee [TAC]);
- TRCA;
- MOECC;
- MNRF; and
- MTCS.

A period of one (1) month was provided for review agencies and stakeholders to provide comment and feedback on the Draft EPR. This feedback was used to inform the direction of the Project, as appropriate. Summary tables of the comments provided by the review agencies and responses/action items provided by Metrolinx are provided in **Appendix C5**.

7.1.6 Notice of Completion of Environmental Project Report

The Notice of Completion was issued to the public on September 14, 2017 and published in the following local newspapers:

- Scarborough Mirror - September 14, 2017 and September 21, 2017;
- East York/Riverdale/Beach Mirror - September 14, 2017 and September 21, 2017;
- Le Metropolitain - September 13, 2017 and September 20, 2017; and
- Toronto L'Express - September 12, 2017 and September 19, 2017.

The Notice of Completion has also been posted to the Project Website and at the Danforth and Scarborough GO Stations from September 13, 2017 until October 16, 2017 (**see Appendix C2**).

The Notice of Completion was sent by e-mail and addressed mail to the MOECC Special Project Officer, MOECC Environmental Approvals Branch Director, and MOECC Environmental Approvals Branch Regional Director. To reach the online audience, social media posts on Metrolinx and GO Transit Facebook pages and Twitter accounts (@Metrolinx, @MetrolinxFR, @GOTransit and @GOTransitFR) were posted on September 14, 2017.

The Notice of Completion was also e-mailed to stakeholders (including property owners on the Project Mailing List, government review agencies and Indigenous communities) and attendees of PM #1 and #2, where e-mail was available. Property owners within 30 m of the Study Area and Indigenous communities were sent addressed mail while property owners between 30 m to 200 m were sent unaddressed admail.

7.2 Consultation with Review Agencies and Stakeholders

As part of the Review Agencies and Stakeholder consultation a number of meetings were held during the Pre-TPAP and TPAP Phases of the Project. The feedback received during the various meetings was used to inform the direction of the Project, as appropriate. Notable outreach to date includes:

- Six (6) meetings with the City of Toronto Technical Advisory Committee;
- Elected official briefings;
- Meetings with various Indigenous communities to discuss Metrolinx projects;
- Meetings with various community groups; and
- Meetings with City of Toronto, Waterfront Toronto and TRCA.

Table 7-1 outlines Review Agency and Stakeholder correspondence and meetings that have taken place to date as part of this Project. Detailed meeting minutes, presentation materials and correspondence are located in **Appendices C4 through C8**

Table 7-1: Review Agencies and Stakeholder Consultation

Stakeholder	Date	Summary
MOECC Ian Greason Supervisor – Team 4, Approval Services Environmental Approvals Branch	June 8, 2016	Metrolinx provided MOECC with a letter requesting permission to use the FTA and FRA algorithms modelling via Cadna/A for noise assessments instead of the STEAM algorithm modelling via Stamson. Cadna/A is a more sophisticated 3-dimensional modeling system, implementing a more flexible prediction methodology, and is considered more accurate. This modelling approach has previously been accepted by the MOECC on Metrolinx projects and consistency is desirable for comparison between projects including corridor specific service expansion and electrification.
MOECC Chunmei Lui, Central Region	November 10, 2016	Metrolinx provided MOECC with a cover letter that was included with hardcopies of the Draft EPR. The cover letter described how comments could be submitted to the project team.
MOECC Karan Jandoo, Environmental Approvals Branch, Environmental Assessment Services	November 10, 2016	Metrolinx provided MOECC with a cover letter that was included with hardcopies of the Draft EPR. The cover letter described how comments could be submitted to the project team.
MOECC Header Merza, Environmental Approvals Branch, Approval Services	November 10, 2016	Metrolinx provided MOECC with a cover letter that was included with a hardcopy of the Draft EPR. The cover letter described how comments could be submitted to the project team.
TRCA Renee Afoom-Boateng, Environmental Assessment Planning	November 10, 2016	Metrolinx provided TRCA with a cover letter that was included with a hardcopy of the Draft EPR. The cover letter described how comments could be submitted to the project team.
MOECC Header Merza, Environmental Approvals Branch, Approval Services	December 1, 2016	Metrolinx provided MOECC with a cover letter that was included with a hardcopy of the Noise and Vibration report. Metrolinx indicated that summaries of relevant report details for the noise and vibration sections (Sections 4.4 and 5.4) of the Draft EPR were being prepared and would be emailed as soon as they were completed.
MOECC Karan Jandoo, Environmental Approvals Branch, Environmental Assessment Services	December 1, 2016	Metrolinx provided MOECC with a cover letter that was included with a hardcopy of the Noise and Vibration report. Metrolinx indicated that summaries of relevant report details for the noise and vibration sections (Sections 4.4 and 5.4) of the Draft EPR were being prepared and would be emailed as soon as they were completed.
MOECC Meeting Minutes	August 16, 2017	Metrolinx met with MOECC staff to discuss the Project and Electrification TPAP Noise and Vibration Report comments and responses. Metrolinx provided a brief overview of both projects and current status/timelines. Metrolinx posted technical reports (including Noise and Vibration and Air Quality) on the project website and had held community meetings to receive feedback on the results. Community feedback received regarding noise was being addressed in a separate process from the TPAPs. Additional comments from the

Table 7-1: Review Agencies and Stakeholder Consultation

Stakeholder	Date	Summary
		MOECC on the Noise and Vibration Reports used in both TPAPs were reviewed. The summary of resolution for each comment was included in a spreadsheet that was reviewed during the meeting.
MOECC Karan Jandoo, Environmental Approvals Branch, Environmental Assessment Services	December 9, 2016	Letter from MOECC regarding the completion of its review of the Draft EPR. The letter contains comments, pertaining to the identified sections of the Draft EPR documentation, for consideration by Metrolinx when finalizing the EPR.
MTCS	December 7, 2016	Letter from MTCS outlining comments and recommendations on the Draft EPR.
TRCA	December 5, 2016 and January 20, 2017	Letters from TRCA outlining comments and recommendations on the Draft EPR.
TRCA	March 2, 2017	Discussion of responses provided by Metrolinx to TRCA comments received on the Draft EPR.
TRCA	June 23, 2017	Letter from TRCA acknowledging Notice of Commencement and outlining TRCA areas of interest.
City of Toronto Technical Advisory Committee (TAC) Meeting #1	February 11, 2016	During this meeting, Metrolinx provided City of Toronto staff with a general overview of the project and expected timeline and milestones. Other topics of discussion included: TPAP, specialist studies, consultation approach and next steps.
City of Toronto TAC Meeting #2	May 17, 2016	Metrolinx provided City of Toronto staff with a brief project overview and a review of draft preliminary design plates. Also included was discussion on retaining walls, project schedule, consultation milestones and next steps.
City of Toronto TAC Meeting #3	September 23, 2016	A summary of what was discussed at TAC#2 was reviewed. Metrolinx presented an overview on the the Project and the Danforth GO Station Planning Study. Metrolinx provided a list of anticipated community concerns regarding the Project including the removal of trees, noise and vibration, air quality, safety and overall construction impacts. Metrolinx indicated that additional information will be available in support of the fall public meetings. Project schedule, consultation milestones and next steps were also discussed.
City of Toronto TAC Meeting #4	November 4, 2016	Metrolinx provided an overview of the Project and the plans for fall public meetings including a focus on existing conditions, the website link to the public notice, and the locations and times of the public meetings within the Study Area. Metrolinx provided the sections and details that will be covered in the EPR and also listed the studies to support the effects assessments in the Draft EPR including: Natural Environment Effects Assessment; Socio-Economic and Land Use Effects Assessment; Traffic Impact Study; Cultural Heritage Screening; and, Stage 1 AA. Metrolinx explained the Draft EPR is now ready for Agency review.
City of Toronto TAC Meeting #5	February 9, 2017	Metrolinx indicated that the purpose of this meeting was to discuss City of Toronto comments on the Draft EPR which had been circulated in November 2016. The City provided comments on January 2017. Metrolinx indicated that they would like to work with City of Toronto to resolve any issues before the Notice of Commencement is issued. The meeting covered the following key themes with respect to the

Table 7-1: Review Agencies and Stakeholder Consultation

Stakeholder	Date	Summary
		comments: Culverts, Structural and Bridge Design, Bridge Widening, Forestry and Impacts, Retaining Walls, City Planning, Air Quality, Noise and Vibration, Dust, Transportation Services, Utilities, and Forestry and Parks. Metrolinx outlined next steps which included scheduling a TAC meeting prior to the next PIC to discuss information that will be presented to the public.
City of Toronto TAC Meeting #6	June 27, 2017	The purpose of this meeting was to provide an update on the Project since TAC #5 and a discussion of next steps as the project is transitioned from the EA stage to Detail Design. An update was given regarding TPAP studies and schedule by Metrolinx. Public meetings were also discussed. Detail design topics covered included retaining walls, Merrill Bridge Road Park, Storm Water Management Report, access locations for construction, property leases, bridge structures, municipal utility infrastructure, detailed design package, TRCA regulated areas and boundaries, corridor fencing and security, and SMART Track connections.
Don Yard Workshop/Broadview Meeting	February 18, 2016	This meeting was held in conjunction with staff from the City of Toronto, TRCA, Waterfront Toronto and the Waterfront Secretariat. The purpose of this meeting was to review the projects occurring within the Don Yard area and to discuss a joint strategy on addressing electrification and Lakeshore East Corridor issues.
Metrolinx and Gardiner East EA Meeting	March 10, 2016	This meeting occurred between Metrolinx and representatives from the Gardiner East EA team. The meeting provided an opportunity to review the Gardiner East EA recommended preferred alternative (Hybrid Option 3) as it relates to Metrolinx infrastructure, expansion programs and operations. Metrolinx was requested to provide preliminary comments for consideration and reflection through the Gardiner East EA report.
Letter to Gardiner East EA team	May 12, 2016 (further to March 10, 2016 meeting)	Metrolinx provided the Gardiner East EA team with a letter (following the March 10, 2016 meeting) which outlined Metrolinx comments. Metrolinx noted that as the planning for the Gardiner East EA project proceeds, all temporary and final designs, staging plans and specifications related to and/or affecting the rail corridor and railway infrastructure, must be reviewed and approved by Metrolinx.
Gardiner East EA Coordination Meeting	April 1, 2016	The meeting provided an opportunity to review the Gardiner East EA Hybrid Option 3 and Metrolinx infrastructure related to the area.

7.2.1 Metrolinx Design Review Panel

The Metrolinx Design Review Panel (MDRP) includes internal and external members from a range of design professions including:

- Architecture;
- Urban Design;
- Landscape Architecture;
- Engineering; and
- Ad hoc members as expertise is required.

The purpose of the MDRP is to integrate design excellence into Project evaluation, ensure appropriate design guidelines are in place and establish a design review process including a design review panel with a high standard of professional expertise.

Designs for key elements of the Project, including significant public facing retaining walls and corridor facing retaining walls that may be notable from a public realm perspective, will be reviewed by the MDRP during Detailed Design.

7.3 Consultation with the Public

Members of the public requesting general Project information were directed to the Project Website and notified of Public Meetings held in November 2016 and June 2017. As the Project progressed, the Project Mailing List was maintained and updated accordingly. All public comments and issued responses are detailed in **Appendix C8**.

7.4 Consultation with Indigenous Communities

On January 19, 2015 a formal request was sent to the MOECC's Environmental Approvals Branch for a list of Indigenous communities that may be interested in the Project. MOECC responded by making reference to the Ministry's website on Indigenous consultation for developing the Indigenous contact list. On February 23, 2015 a formal request was sent to the Ministry of Indigenous Relations and Reconciliation (MIRR) and Indigenous and Northern Affairs Canada (INAC) seeking assistance in identifying specific Indigenous communities with which to consult on the Project. The Indigenous contact list was developed by using the INAC Aboriginal and Treaty Rights Information System (ATRIS).

The following Indigenous communities were contacted over the course of the Project for an opportunity to participate and provide comments:

- Williams Treaties First Nations
- Alderville First Nation
- Beausoleil First Nation
- Chippewas of Georgina Island
- Chippewas of Mnjikaning (Rama)
- Curve Lake First Nation
- Hiawatha First Nation
- Huron-Wendat First Nation
- Kawartha Nishwabe First Nations
- Métis Nation of Ontario
- Mississaugas of the New Credit First Nation
- Mississaugas of Scugog Island First Nation
- Six Nations of the Grand River Territory

Each of the above-noted Indigenous communities were circulated invitations to Public Meetings, the Notice of Commencement, and the Notice of Completion as noted under **Sections 7.1.3, 7.1.4 and 7.1.6**. In addition, notable outreach to discuss Metrolinx projects included:

- Three meetings with representatives from Williams Treaties First Nations;
- Three meetings with representatives from Huron-Wendat Nation;
- One meeting with representatives from Mississaugas of the New Credit First Nation; and
- One meeting with representative from Six Nations of the Grand River Territory.

Table 7-2 provides a summary of the meetings that have taken place with Indigenous communities to date, as part of this Project. Meeting minutes and presentation materials are located in **Appendix C9**.

Table 7-2: Consultation with Indigenous Communities

Indigenous Community	Date	Summary
Huron-Wendat Nation	September 27, 2016	<p>The purpose of this meeting was to provide an overview of Metrolinx, planned transit expansion projects, an opportunity to address any preliminary concerns, and to gain input. An overview of the TPAP was provided including pre-TPAP planning, consultation requirements and approach, documentation and associated review.</p> <p>Metrolinx provided an overview of the following projects; GO Rail Network Electrification, Hamilton LRT, Hurontario LRT, Barrie Rail Corridor Expansion, works in the vicinity of the historic Allandale Station, Burloak Drive Grade Separation, Lakeshore East Rail Corridor Expansion – Don River to Scarborough GO Station, Lakeshore East Rail Corridor Expansion – Guildwood to Pickering and Union Station Rail Corridor East Expansion.</p> <p>The Huron-Wendat Nation stated that to improve consultation they have developed project specific action plans with the Ministry of Transportation (MTO) to assist in project coordination, and suggest the use of these action plans with Metrolinx. Metrolinx advised that they would reach out to MTO to discuss. It was agreed that regular meetings with the Huron-Wendat would ensue to provide an opportunity to discuss various Metrolinx projects. The Huron-Wendat Nation noted that they had information to provide Metrolinx regarding potential mitigation measures and protocols for archaeological assessment.</p>
Huron-Wendat Nation	December 1, 2016	<p>The purpose of this meeting was to provide the Huron-Wendat Nation an overview Metrolinx EA's and projects including GO Rail Network Electrification, Hamilton LRT, Hurontario LRT, Barrie Rail Corridor Expansion, Burloak Drive Grade Separation, Lakeshore East Rail Corridor Expansion, USRC Expansion. The Huron-Wendat Nation suggested the creation of a consultation and engagement framework with Metrolinx, to provide clarity and to enable Huron-Wendat Nation resources can be used more efficiently.</p>
Huron-Wendat Nation	February 13, 2017	<p>An update was given on the GO Transit Electrification project. A draft framework agreement was discussed. There was also discussion around the protection of burial sites, and the handling of remains.</p>
Mississaugas of the New Credit	September 19, 2016	<p>The purpose of this meeting was to provide the Mississaugas of the New Credit First Nation with an overview of various Metrolinx projects, provide an opportunity to address any preliminary concerns and to gain input. An overview was provided on the TPAP process including pre-TPAP planning, TPAP consultation activities and milestones that could be expected for projects.</p> <p>An overview of projects outside the scope of the Lakeshore East Rail Corridor Expansion Project was provided and included the GO Network Electrification, Hamilton LRT, Hurontario LRT, Barrie Rail Corridor Expansion, Bloomington GO Station, Burloak Drive Grade Separation works, Bronte and Highway 407 Park and Ride, Lakeshore East Rail Corridor Expansion – Segment 3, the Union Station Rail Corridor East Enhancements, Stouffville Corridor Grade Separations works, the Niagara Falls GO Rail Extension and the new freight rail corridor. The</p>

Table 7-2: Consultation with Indigenous Communities

Indigenous Community	Date	Summary
		Mississaugas of the New Credit First Nation noted that they would appreciate ongoing consultation and communication.
Six Nations	September 12, 2016	<p>The purpose of this meeting was to provide the Six Nations of the Grand River with an overview of various Metrolinx projects, including the Lakeshore East Rail Corridor Expansion Project, and provide an opportunity to address any preliminary concerns and gain input. In addition an overview was provided on the TPAP process including pre-TPAP planning, TPAP consultation activities and project milestones that could be expected.</p> <p>An overview of projects outside the scope of the Lakeshore East Rail Corridor Project was provided and included the GO Rail Network Electrification, Burloak Drive Grade Separation works, Bronte and Highway 407 Park and Ride, Hamilton Light Rail Transit (LRT), Hurontario LRT, the Niagara Falls GO Rail Extension and the new freight rail corridor. The Six Nations of the Grand River noted that they would appreciate ongoing consultation and communication.</p>
Williams Treaties First Nations	May 26, 2016	<p>The purpose of this meeting was to provide the WTFN representatives with an overview of various Metrolinx projects, including the Lakeshore East Rail Corridor Expansion Project. Representatives from Mississaugas of Scugog Island First Nation, Alderville First Nation, Hiawatha First Nation and Curve Lake First Nation were in attendance. Metrolinx provided an overview the organization, ongoing initiatives, and the TPAP including the structure of consultation activities and milestones. WTFN that confirmed all notifications and correspondence should be addressed to the WTFN community's Chief and copied to Karry Sandy McKenzie. In addition, WTFN noted that project notices do not always provide much context for understanding the local environment and could be improved by better identifying major waterbodies and providing links to online mapping.</p> <p>The next part of the meeting provided an overview of Metrolinx projects. It was noted that the WTFN communities are interested in all stages of archaeological assessments. For example, at Stage 1 the communities may be able to share some background and/or existing conditions information that could help to inform the assessment. WTFN communities have staff available for archaeological monitoring and typically one community would act as the representative providing a monitor on behalf of the WTFN. The importance of respecting the handling of any human remains was noted, including the need to consider and incorporate ceremonial practices. The meeting concluded by discussing various educational, employment, and fare discount opportunities.</p>
Williams Treaties First Nations	July 18, 2016	<p>The purpose of this meeting was to provide the WTFN representatives with an overview of various Metrolinx projects, including the Lakeshore East Rail Corridor Expansion Project, and provide an opportunity to address any preliminary concerns and gain input. Metrolinx provided an overview the organization and its ongoing initiatives, and discussed the TPAP including the structure of consultation activities and milestones.</p>
Williams Treaties First Nations	September 29, 2016	<p>The purpose of this meeting was to provide WTFN communities with an update of various Metrolinx projects including the Lakeshore East Rail Corridor Expansion Project. Questions were asked regarding the presences of First Nations archaeological monitors for Stage 2 AAs and</p>

Table 7-2: Consultation with Indigenous Communities

Indigenous Community	Date	Summary
		the public meeting process for this project.

7.5 Consultation with Elected Officials and Community Organizations

Consultation with elected officials and community organizations was carried out throughout the course of the Project through meetings and written correspondence. In addition, all elected officials and community organizations were circulated invitations to Public Meetings, the Notice of Commencement, and the Notice of Completion.

Table 7-3 provides a summary of correspondence and meetings with elected officials that have occurred to date as part of this Project. Meeting minutes, presentation materials and correspondence are located in **Appendix C10**.

Table 7-3: Summary of Outreach to Elected Officials and Community Organizations

Stakeholder	Date	Summary
Old Riverdale & MPP Peter Tabuns (Toronto – Danforth) Meeting	May 2, 2016	<p>A public meeting was hosted by Member of Provincial Parliament (MPP) Peter Tabuns (Toronto-Danforth) where Metrolinx staff discussed the Lakeshore East Rail Corridor Expansion project and electrification of the service. Approximately 30 members of the public attended the meeting.</p> <p>Residents were concerned about being engaged early on in the planning process and having an opportunity to understand and influence how the planned work will impact their community. Concerns were also raised about the information available on the projects thus far and the need for more detail and information on the website. Metrolinx indicated that there would be a number of opportunities for the community to provide feedback and was working towards redesigning the Metrolinx website to provide easier and better access to information about the program and local projects. Metrolinx stated that regular updates would be sent and public meetings would be held in order to provide residents with information in a timely manner.</p> <p>Concerns were raised about current noise and vibration levels, future increases in noise and vibration from expanded GO service and construction at night. Metrolinx acknowledged that there will be instances where construction will have to take place at night. However, Metrolinx reassured residents that there would be proper notice provided and that there would be a dedicated community relations resource for the community to contact during planning and construction.</p> <p>Residents raised concerns regarding impacts to property values. Metrolinx responded that it is difficult to speculate on the impacts to property values. In general, there is evidence to show that when homes are located close to transit, the close proximity can have a positive impact on property value. However, each property is different. There are other factors that can determine property value. For example, the economy and housing markets, changing characteristics of the area, manufacturing demand, local employment, etc.</p>
Initial briefing email to elected officials	June 2016	Elected officials whose electoral riding intersected with the Study Area were sent an email from Metrolinx introducing the Lakeshore East Rail

Table 7-3: Summary of Outreach to Elected Officials and Community Organizations

Stakeholder	Date	Summary
		Corridor Expansion project and to schedule a briefing.
Ward 30 Toronto-Danforth Councillor, Paula Fletcher and MPP Peter Tabuns (Toronto – Danforth) Briefing	July 20, 2016	Metrolinx presented an overview of the project in advance of the first round of public meetings in the fall. Key concerns mentioned were noise and vibration, impacts on trees/vegetation, and visual impact for the OCS structures and noise walls. For the latter, by both Councillor Fletcher and MPP Tabuns, it was advocated for a design competition to create aesthetically pleasing designs for identified noise walls along with a consistent approach across the corridor. Concern was also expressed regarding the frequency of trains through this section of corridor given the proximity of both the Stouffville and Lakeshore East services with trains passing by every few minutes.
MP Nathaniel Erskine-Smith (Beaches – East York) Briefing	July 20, 2016	Metrolinx presented an overview of the project in advance of the first round of public meetings in the fall. MP Erskine-Smith asked questions about the ridership projections for 15-minute service. Metrolinx committed to sending the initial business case and more information on the City of Toronto's Danforth Avenue Planning Study.
Ward 32 Beaches-East York Councillor, Mary-Margaret McMahon Briefing	August 11, 2016	Metrolinx briefed Councillor McMahon on the Lakeshore East Rail Corridor Expansion project. Councillor McMahon requested more information on planned noise mitigation and public engagement. Metrolinx indicated that the environmental studies were in progress and that more information would be shared as it became available. With respect to the Danforth Station Planning Study Councillor McMahon recommended that Metrolinx reach out to Ted Reeve Arena to discuss redevelopment plans as part of the study.
Riverside BIA Briefing	August 10, 2016	A meeting was held with the Riverside BIA regarding the Electrification and Lakeshore East Rail Corridor Expansion projects. A question was asked in regards to a potential Queen Street East station. Metrolinx discussed the network-wide new station analysis and directed the BIA to the new stations website for more information. Overall, there were generally no concerns with the information provided.
Community Group in the area of Degraffi Street, Cummings Street and Wardell Street	August 18, 2016	A phone call was completed with Elain Patterson, representing a community group in the area of Degraffi Street, Cummings Street, and Wardell Street. Metrolinx provided an overview of the project and offered to meet with the community group in the future for a formal briefing and to provide an opportunity to ask questions.
Danforth Community Crossroads BIA	August 23, 2016	An outreach email was sent from Metrolinx to Chair Murillo to introduce the Lakeshore East Rail Corridor Expansion project and to schedule a briefing.
Gerrard India Bazaar Community	August 23, 2016	An outreach email was sent from Metrolinx to Chair Kapoor to introduce the Lakeshore East Rail Corridor Expansion project and to schedule a briefing.
MP Julie Dabrusin (Toronto-Danforth) Briefing	August 23, 2016	Metrolinx presented an overview of the project to MP Dabrusin. MP Dabrusin shared concerns about noise, vibration and the visual impact of the GO expansion project and electrification. MP Dabrusin was interested in learning more about the planned mitigation. Metrolinx noted that the first round of public meetings were being scheduled for the fall.
Ward 31 Beaches-East York Councillor, Janet Davis Briefing	September 8, 2016	Metrolinx presented an overview of the Lakeshore East Rail Corridor Expansion project and the Danforth Station Planning Study to Councillor Davis. Councillor Davis requested to learn more about the Danforth

Table 7-3: Summary of Outreach to Elected Officials and Community Organizations

Stakeholder	Date	Summary
		Station Planning Study and Metrolinx indicated that further follow-up would be provided beyond this briefing. Councillor Davis flagged an ongoing Hydro One EA in the area and mentioned that City of Toronto was completing a traffic study around TTC Main station.
Danforth Village Residents' Association Meeting	October 4, 2016	Metrolinx presented information regarding the Lakeshore East Rail Corridor Expansion project to the Danforth Village Residents' Association. Approximately 50 people were in attendance including Ward 32 Beaches-East York Councillor McMahon. Attendees had concerns regarding noise and vibration, visual impacts (electrification), and impacts to trees/vegetation.
MPP Arthur Potts (Beaches-East York) Briefing	October 14, 2016	Metrolinx presented information regarding the Lakeshore East Rail Corridor Expansion project to MPP Potts.
Old Riverdale & MPP Peter Tabuns (Toronto – Danforth) Meeting	November 3, 2016	A public meeting was hosted by MPP Peter Tabuns to provide an update on the planned GO service increase in the Old Riverdale area and electrification of the GO service. Approximately 40 members of the public attended the meeting. A number of questions focused on noise and vibration impacts and proposed mitigation, tree removal, design of the proposed noise walls, and timing for decisions on fleet procurement and the planned service level increases.
Old Riverdale Presentation to MX Meeting	May 29, 2017	Metrolinx met with residents of the Old Riverdale neighbourhood. A presentation was given by the residents along with recommendations to Metrolinx. A submission, dated May, 2017, was made to Metrolinx from the residents of Old Riverdale concerning GO Expansion plans. A response letter was provided by Metrolinx on June 9, 2017 to the Residents of Old Riverdale.
Old Riverdale & MPP Peter Tabuns (Toronto – Danforth) Meeting	July 4, 2017	A meeting was held with the residents of Old Riverdale for a Q&A session. Approximately 10 community members were in attendance as well as MPP Tabuns. Residents were concerned about noise wall height and requested to increase the height of noise walls to mitigate to the level of third story home. MPP Tabuns was also concerned about mitigating noise for the third story bedrooms and indicated that he would raise this issue with the Minister during the formal TPAP review. Residents were also concerned about the long-term health effects of the increased frequency train service and questioned why Metrolinx is using an average noise level as opposed to the impact of the pass-by noise. Metrolinx explained that noise is viewed as a cumulative impact on health and that is why an average is used to assess where noise mitigation is required. Metrolinx stated a commitment to install a noise monitor in advance of construction to establish a noise baseline and to monitor noise and vibration levels throughout the construction. Metrolinx also committed to re-evaluating the noise mitigation if there are issues once service is running. Metrolinx confirmed that extending the noise wall across Monarch Park to fill in the gap between the existing two identified noise walls would be reviewed. Metrolinx indicated that a draft terms in reference for Community Advisory Committee would be provided in the coming weeks and to begin meeting with the community once the committee membership and terms of reference have been finalized.
Lakeshore East	July 13, 2017	A community meeting was hosted by the Lakeshore East Rail Corridor

Table 7-3: Summary of Outreach to Elected Officials and Community Organizations

Stakeholder	Date	Summary
Coalition Meeting		<p>Expansion Citizens Coalition with guests MPP Potts, Councillor McMahon, and Metrolinx. The meeting was held in a Q&A format. There were a variety of questions concerning the timing and duration of construction. Comments and questions were posed throughout the meeting about how an increase in noise would be addressed. Metrolinx indicated that as part of the TPAP a noise assessment is completed. Residents stated that existing noise levels are currently too high and that Metrolinx needs to mitigate for existing and future conditions. Members of the public questioned the validity of a 20+ year noise protocol and suggested that it needs to be updated to reflect current conditions. Metrolinx indicated that it was understood that noise is an ongoing issue, and is developing a Noise Action Plan (NAP) that will identify opportunities to mitigate for construction and operational noise. Metrolinx will be conducting pre-condition surveys of homes and encouraged residents to participate in the survey when the time comes. The survey will establish a baseline or photo documentation in the event of damage during construction or operation. Metrolinx is looking at options for source-point vibration mitigation such as ballast mats for the new track section.</p> <p>Metrolinx stated that as part of the expansion project, high security fencing will be installed to secure the corridor and reduce graffiti, trespassing and any other loitering or other illegal gatherings.</p>
Friends of Monarch Park Meeting	July 25, 2017	<p>Metrolinx met with two individuals from the Friends of Monarch Park. The primary concern of the attendees was potential loss of land due to expropriation along the southern property line. Another concern was the impact of the Lakeshore East Rail Corridor on the pedestrian tunnel that runs underneath the track connecting Monarch Park to Woodfield Road (on the south side of the Lakeshore East Rail Corridor). Metrolinx advised that there are no plans to expropriate parkland within Monarch Park and that construction would take place on Metrolinx land on the south side of the property line. Metrolinx confirmed that there were no changes in the plans to impact the tunnel. Metrolinx indicated that there would be construction along the property line and that there would be an impact to vegetation or trees within 7 m of the property line.</p> <p>The attendees were concerned that there would be a gap in the noise wall and preferred that the wall was continuous but was receptive to Metrolinx rationale for the gap (i.e. additional tree removal). Metrolinx indicated that there would be an initiative to provide planted trees for areas where trees are removed. The attendees provided feedback that native species were planted in the park to educate and promote environmental awareness and that future tree planting should incorporate this tradition.</p>

7.6 Ongoing Engagement

Metrolinx is committed to continuing to engage and communicate with stakeholders beyond the TPAP. Specifically, Metrolinx will:

- Design and implement a response strategy to address/resolve potential construction concerns;
- Maintain the Project website throughout the Detailed Design and construction phases where the public can access updated information on the Project;

- Continue discussions/consultation with local stakeholders with respect to potential impacts during the Detailed Design and construction phase, as appropriate; and
- Provide a Community Liaison staff member to ensure two-way communication with local stakeholders during the Detailed Design and Construction phases.

8. Future Commitments and Monitoring

8.1 Canadian Environmental Assessment Act 2012 (CEAA 2012) Review

The Regulations Designating Physical Activities under the *Canadian Environmental Assessment Act (CEAA) 2012* identify the physical activities (i.e., types of projects) that constitute “designated projects” that may require a Federal EA. A review of the Regulations was carried out by Metrolinx with respect to the Project. Based on this review, this Project does not constitute a designated project under *CEAA 2012*.

CEAA 2012 also outlines requirements for determination of the likelihood of significant environmental effects for a physical activity that is carried out on federal lands, or outside Canada, in relation to a physical work and that is not a designated project (Section 67 of *CEAA 2012*). Where proposed works will be carried out on federal land it is anticipated that the information provided in this EPR, as well as ongoing discussions with federal agencies during Detailed Design, will provide sufficient information to address federal significance determinations under *CEAA 2012*.

8.2 Permits and Approvals Required

In accordance with *O. Reg. 231/08*, the TPAP will be completed when Metrolinx submits a Statement of Completion to the Director and Regional Director of the MOECC, excluding any unforeseen circumstances that may require a change to the transit project.

Metrolinx may submit a Statement of Completion under the following circumstances:

- The Minister of the Environment and Climate Change gives a notice allowing the proponent (Metrolinx) to proceed with the project in accordance with the EPR.
- The Minister of the Environment and Climate Change gives a notice allowing the proponent (Metrolinx) to proceed with the project in accordance with the EPR, subject to conditions.
- The Minister of the Environment and Climate Change gives a notice requiring further consideration of the project and subsequently gives a notice allowing the proponent (Metrolinx) to proceed with the project in accordance with a Revised EPR.
- The Minister of the Environment and Climate Change gives no notice within 65 days of the proponent (Metrolinx) giving the Notice of Completion.

In addition to the commitments to future work outlined in **Table 8-1**, permits and approvals obtained for the proposed works may identify the need for additional mitigation. Any additional mitigation measures required in connection with a permit or approval will be implemented.

8.2.1 Federal

8.2.1.1 Fisheries and Oceans Canada

For any areas identified during Detailed Design that require in or near water works, a Self-Assessment under the *Fisheries Act* will be undertaken by a qualified professional to determine appropriate mitigation measures and to confirm whether further assessment and review is required by DFO.

8.2.1.2 Transport Canada

The *Navigation Protection Act (NPA)* includes a schedule of navigable waters that require regulatory approval for works that risk a substantial interference with navigation. The waterways crossed by this Project are not named “scheduled” navigable waterways; however, Lake Ontario is a “scheduled” navigable waterway and that includes the “mouths” of waterways connecting to Lake Ontario. Transport Canada has confirmed that at the Don River Bridge the NPA does not apply and a Notice of Works would not be required under the NPA.

Works approved under the former *Navigable Waters Protection Act (NWPA)* were transitioned into the current NPA regime. Consequently, any term or condition imposed on a work under the NWPA remains in effect. Owners of works in non-scheduled waterways have the option to opt-out of the NPA within five years of the coming into force date (i.e., before April 1, 2019). Prior to construction Metrolinx will review any applicable previous approvals and consider NPA opt-out for non-scheduled waterways. Transport Canada will be consulted as appropriate in the context of the NPA.

8.2.2 Provincial

8.2.2.1 Ministry of the Environment and Climate Change

As prescribed under *O. Reg. 63/16*, water taking for construction site dewatering in excess of 50,000 L/day and under 400,000 L/day is subject to registration through EASR. In accordance with Section 34 of the *OWRA*, a Category 3 PTTW from MOECC must be obtained for the taking of more than 400,000 L/day of groundwater for the purposes of construction dewatering from any given source. Permitting requirements will need to be revisited closer to the construction phase when specific details such as construction timing and methods are known. Approvals for the discharge of pumped water will also be required, and could be a combination of Municipal Discharge Permits, Conservation Authority approval (through the Voluntary Project Review process), and/or MOECC ECA in accordance with Section 53 of the *OWRA*. A water discharge management plan would be required, as necessary, based on pre-consultation discussion with MOECC and TRCA staff since the discharge of dewatering effluent may potentially be directed to a local watercourse, depending on the baseline groundwater quality analysis results. Required discharge permits shall be prepared concurrently with the PTTW application or EASR registration. Potential effects of water taking will be assessed and strategies for mitigation will be proposed as part of the Water Taking Assessment application process, if required.

Construction of the railway expansion and construction works at the bridge locations is expected to generate excess soil that cannot be reused on site due to its geotechnical properties or quality of the excess soil. In all cases the on-site and off-site beneficial reuse of excess soil will be explored during Detailed Design and will be undertaken in accordance with *Excess Soil – A Guide to Best Management Practices* (MOECC, January 2014). It is noted that the MOECC is presently contemplating the creation of a Regulation to govern excess soil management. Should this Regulation come into force within the implementation of the Project the requirements will be incorporated as applicable.

8.2.2.2 Ministry of Natural Resources and Forestry

Terrestrial

The potential for the presence of SAR and SWH were identified during the background information review and field investigations. The following additional terrestrial field investigations may be required for the purposes of permitting and approvals; these shall be confirmed with the MNRF:

- Snag surveys to be completed, subject to scope of work consultation with MNRF during Detailed Design, in all forest and swamp communities where vegetation removal is proposed; these will be conducted following the methods outlined in the protocols described in the *Technical Note Species at Risk (SAR) Bats* developed by the MNRF (2015h) and the *Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-coloured Bat* (MNRF, 2017) or as amended through consultation with MNRF.
- Targeted SAR plant or wildlife surveys may be warranted, which is to be determined based on consultation with the MNRF during Detailed Design.
- This may include Butternut Health Assessment, conducted by a qualified Butternut Health Assessor, as required, to assess the health of any pure Butternuts (hybrids are not protected by the ESA) that are identified in or within 50 m of the rail ROW during Detailed Design.

The MNRF shall be consulted at preliminary stages of Detailed Design to confirm whether an authorization or permit under the *ESA* would be required, for SAR identified during the TPAP phase. Such consultation at that time will also identify any additional SAR-targeted survey requirements, mitigation and/or compensation measures and monitoring requirements.

If during construction, removal of SAR habitat is required, a registration of construction activity with the MNRF via Notice of Activity in accordance with *O. Reg. 242/08* under the *ESA* is required.

8.2.2.3 Ministry of Tourism, Culture and Sport

Archaeology

A Stage 1 AA was carried out for the Study Area, and this has been submitted to MTCS in accordance with Section 65 of the *Ontario Heritage Act*. A Stage 2 AA is recommended on any lands that will be impacted by the Project if it is shown as retaining potential for archaeological resources.

MTCS reviews reports prepared by licensed archaeologists, including archaeological assessment reports, to ensure that the licensed archaeologist has met the terms and conditions of his or her licence including MTCS requirements for field work and reporting. MTCS then provides the consultant archaeologist with a letter. If the report complies with MTCS requirements, the letter confirms that the MTCS have entered it into the Ontario Public Register of Archaeology Reports. Approval authorities can use this letter to verify that a development proponent has addressed concerns for archaeological sites on the property that was assessed. If the report does not comply with MTCS requirements, the MTCS letter identifies concerns with the report and requests further archaeological field work and/or revisions to address the concerns. MTCS staff will review and respond to additional reporting once submitted.

Cultural Heritage

If any property within the Study Area becomes classified as a Provincial Heritage Property as a result of a CHER, the property will also be reviewed to identify if further heritage assessment studies are required. If a Provincial Heritage Property is identified and is contemplated for removal, demolition or transfer from provincial control, Metrolinx will engage MTCS to gain feedback and to initiate an HIA. This will be determined after the review and approval of the Metrolinx Heritage Committee.

8.2.3 Timing Windows and Preventative Measures

It is recognized that there are overlapping timing windows and Metrolinx will consult further with the applicable regulatory agencies to determine a suitable approach for construction scheduling.

8.2.4 Municipal

Although Metrolinx, as a Provincial Agency, is not subject to municipal permits and approvals, Metrolinx will endeavour to adhere to the intent of the relevant permits/approvals requirements to the greatest extent possible, and will submit applications for review and information. Metrolinx will endeavour to adhere to municipal Noise By-laws and policies in areas where it operates.

Metrolinx will continue to communicate and engage with the City of Toronto during Detailed Design and during construction planning to ensure that any municipal concerns are addressed in the construction plans prior to commencement of construction activities, as follows:

- Metrolinx will consult with, and have regard for, the municipal planning policies with regard to specific projects (or components thereof) and will comply with the municipal requests when and where reasonable.
- When developing plans for new or expanded infrastructure, Metrolinx will co-ordinate with municipal staff to ensure infrastructure is constructed to meet municipal requirements to the greatest extent possible.
- Submissions relating to permits for construction within the existing road allowances will be made in accordance with municipal requirements, as applicable.
- Submissions for Municipal Discharge Permits for the discharge of pumped water associated with construction dewatering activities, as applicable.
- Submission relating to City of Toronto Urban Forestry By-laws will be made in accordance with City of Toronto's requirements, as applicable.
- Submission relating to City of Toronto Tree Protection By-laws will be made in accordance with City of Toronto requirements, as applicable.
- Metrolinx will endeavour to adhere to municipal Noise By-laws and policies in areas where it operates.
- Metrolinx will coordinate with the City of Toronto Capital Works Program on works proposed within the vicinity of the Project.

Metrolinx is establishing a Vegetation Compensation Protocol for Metrolinx RER projects and vegetation that is removed will be compensated for in accordance with the provisions of this protocol:

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 along long stretches of 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 community types/ ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final 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.

8.2.4.1 Toronto and Region Conservation Authority

The activities of all federal and provincial Crown corporations are exempt from conservation authority permitting activities under Section 28 of the *Conservation Authorities Act* and under Ontario Regulation 166/06 – *TRCA Regulation of Development, Interference with Wetlands and Alteration to Shorelines and Watercourses*. Projects on lands owned by a Crown corporation and on behalf of a Crown corporation are also exempt. As a provincial Crown corporation, Metrolinx will follow the Voluntary Project Review process as per the *Proponents and Projects Exempt from the TRCA Regulatory Approval Process* and request that TRCA reviews and comments on Detailed Design activities associated with project construction, maintenance or emergency activities. TRCA policies, programs and guidelines will be considered as appropriate through the Voluntary Project Review process during Detailed Design. Proponents are responsible for obtaining appropriate approvals independent of TRCA under the *Fisheries Act*, though the proponent can voluntarily seek confirmation from TRCA as to whether the proposed project includes appropriate *measures to avoid causing harm to fish and fish habitat* as per the DFO Self-Assessment process requirements. Once TRCA concerns are satisfied, a Voluntary Project Review Letter is provided by TRCA staff.

This process is applicable to areas of the Project that are located within TRCA regulatory limits.

8.2.4.2 Utilities

The final assessment of utility conflicts will be reviewed in consultation with each utility company as part of Detailed Design. Implementation and construction obligations will be undertaken pursuant to the crossing agreements with each of the utility companies as required.

8.3 Addendum Process

The Project presented in this EPR is not a static plan, nor is the context in which it is being assessed, reviewed, approved, constructed, and used. Given the potential for changes to the Project resulting from the approvals, Detailed Design, and construction processes, it is prudent to include in the EPR a comment on the responsibilities of the proponent should changes be required in the Project.

This EPR identifies the impacts associated with the Project presented herein, and the property envelope within which the Project can feasibly be constructed. The actual layout of Project elements (e.g., grade separations, etc.) are subject to Detailed Design and any variation from that shown in this EPR, unless it results in an environmental impact which cannot be accommodated within the committed mitigation measures, does not require additional approval under *O. Reg. 231/08*.

The TPAP includes provisions (in Section 15 of the Regulation) for proponents to make changes to a transit project after the Statement of Completion is submitted to the Director of the Environmental Assessment and Approvals Branch of the MOECC and the MOECC Regional Director.

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 Project that is inconsistent with the EPR after the Statement of Completion is issued. A change that is inconsistent with the EPR is generally defined as one for which the effects have not been accounted for in the EPR, either directly or through a contingency planning approach in which a worst case scenario has been contemplated and a protocol for addressing change has been included 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 Project may also be required if there is a significant lapse of time (i.e., ten years) between the Statement of Completion and the start of construction, which will require a formal review of the Project by Metrolinx in consultation with relevant stakeholders (in accordance with Section 16 of the Regulation).

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 impacts that the proposed change might have on the environment; and
- A statement of whether the proponent is of the opinion that the proposed change is significant (or not), and the reasons for the opinion.

If changes to the Project indicate that an addendum is required, Metrolinx will have the option of proceeding with the Project changes under the provisions/requirements for an individual environmental assessment in accordance with Part II of the *Environmental Assessment Act*.

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.

8.4 Future Commitments

The EPR commitments are developed to satisfy the requirements of *O. Reg. 231/08*. Specifically the purpose of the commitments is to facilitate the implementation of the Project in accordance with the mitigation measures and monitoring activities described in the EPR and in a manner that does not result in negative impact on matters of provincial interest related to the natural environment or to cultural heritage value or interest, or on constitutionally protected Aboriginal or treaty rights.

Establishing EPR commitments also satisfies the requirements of the TPAP Guide. Specifically, Section 4.3 of the Guide prescribes that the monitoring actions identified in the EPR respecting the mitigation measures must be carried out and reported.

A summary of EPR commitments is provided in **Table 8-1**. All applicable permits, licences, approvals and monitoring requirements under environmental laws will be reviewed, confirmed and obtained by Metrolinx prior to the construction of the Project.

In addition, an Environmental Mitigation and Monitoring Plan (EMMP) will be developed to outline the responsibility for carrying out monitoring and reporting activities, including timing and frequency of monitoring activities, as well as the compliance process. The EMMP will include all mitigation measures, categorized by project phase, and will identify the party responsible for implementation.

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline	Environmental Project Report Commitments	
	Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
Engineering – Track Alignment	<u>Detailed Design</u> <ul style="list-style-type: none"> Refinements to track alignments (within the footprint of the Study Area) will occur during Detailed Design, along with any associated technical studies to assess potential impacts, where required. 	<ul style="list-style-type: none"> N/A
Engineering – Stations	<u>Detailed Design</u> <ul style="list-style-type: none"> Modifications to the Danforth GO Station will be required to accommodate the new fourth track. This will occur during Detailed Design, and will include any associated technical studies to assess potential impacts, where required. The modifications are not anticipated to extend beyond the Study Area. 	<ul style="list-style-type: none"> N/A
Natural Environment – Terrestrial Features – Vegetation Cover and Designated Natural Areas	<u>Detailed Design</u> <ul style="list-style-type: none"> A planting plan will be either developed in consultation with the City of Toronto and/or the TRCA, or provided as a standardized approach developed by Metrolinx in consultation with the agencies. Permits and approvals related to City of Toronto Tree By-laws and municipal tree injury/removal permits will be obtained as required. To support permit applications, an Arborist Report, including tree inventory, will be completed by a qualified arborist during Detailed Design where required. Vegetation removal will occur during the dormant months for vegetation (recommended as between November 1 and March 31 of any year) and will be kept to a minimum and limited to within the construction footprint. TRCA will be consulted to determine boundaries of the wetland compensation area (for another proposed development) that may be adjacent to the rail ROW, and discuss proposed Project works in this area. <u>Construction</u> <ul style="list-style-type: none"> Where possible, stockpile materials and construction equipment will be stored within the construction footprint. Separate laydown and staging areas will likely be required which will be determined during Detailed Design. As laydown and staging areas are identified they will be subject to further environmental due diligence, as required. Construction fencing and/or silt fencing will be installed and maintained to clearly define the construction footprint and prevent accidental damage to vegetation or intrusion to adjacent vegetated areas. Any damaged trees will be pruned through the implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. 	<u>Construction</u> <ul style="list-style-type: none"> Construction fencing and/or silt fencing will be monitored and repaired as necessary throughout the construction period. On-site inspection will be undertaken as required during construction by a qualified Arborist to ensure that only specified trees are removed, fencing is intact, and there is no damage caused to the remaining trees and adjacent vegetation communities. Where City by-laws apply, an unplanned incidence of injured or critically damaged tree that is not part of any tree removal or injury permit will be reported to the City's Urban Forestry department immediately. <u>Operations</u> <ul style="list-style-type: none"> Post-planting monitoring of restoration areas will be completed after construction. Should the plantings and/or seed mix not survive, additional seeding and/or plantings will be undertaken with additional monitoring during the growing season, as per the landscaping warranty.
Natural Environment – Terrestrial Features – Wildlife Habitat	<u>Detailed Design</u> <ul style="list-style-type: none"> The MNRF shall be consulted at preliminary stages of Detailed Design to confirm whether targeted surveys for bat SAR, or any SAR, might be required to determine detailed potential effects and confirm permitting needs/level, if warranted. Snag surveys to be completed, subject to scope of work developed in consultation with MNRF during 	<u>Detailed Design</u> <ul style="list-style-type: none"> A qualified Environmental Monitor will monitor the removal of suitable cavity trees. Additional monitoring may be

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline	Environmental Project Report Commitments	
	Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
	<p>Detailed Design, in all forest and swamp communities where vegetation removal is proposed. Surveys will be conducted following the protocols described in the <i>Technical Note Species at Risk (SAR) Bats developed by the MNRF (2015h) and the Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-coloured Bat (MNRF, 2017)</i> or as amended through consultation with the MNRF regarding the scope of work. According to this protocol, any treed forest or swamp ecosites that include snags with DBH of at least 10 cm shall be considered suitable bat maternity roost habitat.</p> <ul style="list-style-type: none"> Tree removal in suitable bat maternity roost habitat identified through snag surveys (which shall be completed prior to construction, e.g., during the Detailed Design) shall be scheduled to occur outside of the bat roosting season of May 1st to September 1st and cannot occur during the bat maternity period of June 1st to July 31st, in accordance with MNRF's <i>Technical Note Species at Risk SAR Bats (2015h) and the Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-coloured Bat (MNRF, 2017)</i> or as amended by MNRF through consultation. If additional snag surveys are undertaken and tree removal outside of the bat roosting season (May 1st to September 1st) is not possible, tree removal may occur outside of the bat maternity period (June 1st to July 31st) in confirmed suitable bat maternity roost habitat provided that acoustic monitoring surveys, completed prior to vegetation removal, demonstrate that suitable cavity trees are not occupied by maternity colonies or SAR bats. Surveys will be conducted following the protocols described in the <i>Technical Note SAR Bats</i> developed by the MNRF (2015h) and the <i>Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-coloured Bat (MNRF, 2017)</i> or as amended by MNRF through consultation. <p><u>Construction</u></p> <ul style="list-style-type: none"> Additional mitigation measures may be required based on the results of additional surveys and consultations with the MNRF. If additional surveys confirm the absence of suitable bat maternity roost habitat and no SAR bats were recorded, the above timing restrictions need not apply. If during construction, removal of SAR habitat is required, a registration of construction activity with the MNRF via Notice of Activity in accordance with O. Reg. 242/08 under the ESA is required. 	required based on the results of additional surveys and consultations with the MNRF.
Natural Environment – Terrestrial Features – Breeding Birds	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> All works must be completed in compliance with the <i>MBCA</i>. Timing for the breeding bird season varies by habitat and weather conditions. Vegetation removal shall be scheduled to occur outside of May 1st to August 15th. If vegetation must be removed between May 1st and August 15th, nest and nesting activity searches will be conducted by a qualified Biologist no more than 24 hours prior to vegetation removal. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (OBBA, 2001). If an active nest or confirmed nesting activity of a migratory bird is observed, a species-specific buffer area following ECCC guidelines will be applied to the nest or confirmed nesting activity wherein no vegetation removal will be permitted until the young have fledged from the nest. The radius of the buffer will depend on species, level of disturbance and landscape context (ECCC, 2014), which will be confirmed by a qualified Biologist, but will protect a minimum of 10 m around the nest or nesting 	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> A qualified Environmental Monitor will be present during vegetation removal to ensure compliance with environmental requirements.

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline	Environmental Project Report Commitments	
	Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
	<p>activity.</p> <ul style="list-style-type: none"> The results of all nest searches will be documented at the end of each survey day in a technical memorandum, including information on the searcher, date, time conducted, weather conditions, habitat type, vegetation community type, observations of breeding activity, observations of confirmed nests including co-ordinates, and, if required, the buffer applied to identified breeding/nesting sites. <p><u>Construction</u></p> <ul style="list-style-type: none"> If construction activities related to the proposed culvert modifications or bridge widenings take place between May 1st and August 15th, nest surveys will be conducted to confirm absence of nests of migratory birds or bird SAR following Best Management Practices and the findings/results documented. If an active nest is observed, an environmental monitor shall be notified immediately. 	
Natural Environment – Terrestrial Features – Terrestrial SAR and SOCC – Plant Species	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> Where vegetation removal required for construction, the FOD7-3 community will be avoided wherever possible to avoid removal of the SAR or SOCC plant species (Balsam Fir, Poison Ivy, Silky Dogwood, Wild Red Current, Sycamore, American Prickly-ash and Big Bluestem). While impacts to Deciduous Forest (FOD) and designated natural heritage features (e.g., Ravine and Natural Feature Protection areas) cannot be completely avoided, design refinements will be considered during Detailed Design to reduce impacts to FOD and natural heritage features where possible. If any Butternuts are identified during the Detailed Design within 50 m of the Lakeshore East Rail Corridor, a sample should be taken from each individual for genetic testing to determine purity/hybridity. <p><u>Construction</u></p> <ul style="list-style-type: none"> Where feasible, removal of pure Butternut trees will be avoided and protective fencing installed 50 m around the tree to limit any possible disturbance during construction. 	<p><u>Detailed Design / Construction</u></p> <ul style="list-style-type: none"> A qualified Environmental Monitor will monitor the removal of Butternut trees if any are required to be removed.
Natural Environment – Terrestrial Features – Terrestrial SAR and SOCC – Mammal Species	<ul style="list-style-type: none"> See Natural Environment – Terrestrial Features – Wildlife Habitat for details related to mitigation of Terrestrial SAR and SOCC – Mammal Species. 	<ul style="list-style-type: none"> See Natural Environment – Terrestrial Features – Wildlife Habitat for details related to monitoring of Terrestrial SAR and SOCC – Mammal Species.
Natural Environment – Terrestrial Features – Terrestrial SAR and SOCC – Bird Species	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> Scheduling vegetation removal in accordance with the timing windows for breeding birds will avoid mortality and/or disturbance of bird SAR and SOCC species (Barn Swallow, Eastern Wood-pewee, Red-Headed Woodpecker, Wood Thrush, and Common Nighthawk) that may nest in deciduous forest and/ or cultural woodland communities. If vegetation must be removed between May 1st and August 15th, nest and nesting activity searches will be conducted by a qualified Biologist 24 hours prior to vegetation removal to avoid mortality and disturbance. <p><u>Construction</u></p> <ul style="list-style-type: none"> If construction activities related to the proposed culvert modifications or bridge widenings take place between May 1st to August 15th, nest surveys will be conducted to confirm absence of nests of Barn Swallow or other birds protected under the <i>MBCA</i>. If an active nest is observed, an environmental monitor shall be notified immediately. 	<ul style="list-style-type: none"> N/A

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline	Environmental Project Report Commitments	
	Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
Natural Environment – Aquatic Features	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> The need for in or near water works will be determined during Detailed Design. Project in-water works shall be planned in accordance with the warm water timing window (i.e., in-water works permitted between July 1st and March 31st). For any areas identified during Detailed Design that require in or near water works, a Self-Assessment under the <i>Fisheries Act</i> will be undertaken by a qualified professional to determine appropriate mitigation measures and to confirm whether further assessment and review is required by DFO. Stormwater management will be reviewed and addressed during Detailed Design and will be in accordance with the Council adopted City of Toronto Wet Weather Flow Management Guidelines. If works in the vicinity of Small's Creek are required, including in-water, near water, or natural features associated with this creek, TRCA will be consulted through the Voluntary Project Review Process. <p><u>Construction</u></p> <ul style="list-style-type: none"> An Erosion and Sediment Control Plan will be developed and will include the requirement for a spill kit to be on site at all times during construction. Implementation of the erosion and sedimentation control measures will conform to recognized standard specifications such as Ontario Provincial Standards Specification (OPSS). Sediment and erosion control measures (e.g., silt curtains, silt fence) shall be installed prior to site clearing, grubbing, excavation or grading works. Stockpiled material shall be stored at a safe distance from waterways to ensure no deleterious substances enter watercourse. Machinery shall arrive on site in a clean condition and be maintained free of fluid leaks, invasive species and noxious weeds. Whenever possible, machinery shall be operated on land above the high water mark, in a manner that minimizes disturbance to the banks and bed of the waterbody. Machinery shall be washed, refuelled, and serviced properly away from any waterbody. Storage of fuel and other materials for the machinery should be in such a way as to prevent any deleterious substances from entering the water. The construction contractor will be required to develop and implement a site specific Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals and/or spills in a timely and effective manner and to avoid soil and water contamination. 	<ul style="list-style-type: none"> N/A

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline	Environmental Project Report Commitments	
	Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
Soils and Groundwater	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> • Prepare a Soil Management Plan during Detailed Design to address known contamination and any found during construction works. • Phase I ESAs will be completed for additional lands required for the Project (both permanent and temporary) during the Detailed Design phase. Additional studies and mitigation will be implemented as warranted based on the findings of those investigations. • A geotechnical report will be completed during Detailed Design. • Estimates of water taking quantities and resultant dewatering ZOI would be determined during Detailed Design. If dewatering is required a water taking permit (PTTW or EASR registration, as required) will be obtained. <p><u>Construction</u></p> <ul style="list-style-type: none"> • An Erosion and Sediment Control Plan will be developed and will include the requirement for a spill kit to be on site at all times during construction. Implementation of the erosion and sedimentation control measures will conform to recognized standard specifications such as Ontario Provincial Standards Specification (OPSS). Sediment and erosion control measures (e.g., silt curtains, silt fence) shall be installed prior to site clearing, grubbing, excavation or grading works. • Develop a Waste Management Plan address proper handling of all excess materials, including proper handling of all excess material that may be potentially contaminated according to applicable legislation, regulations and standard practices. • Signs of soil impacts (i.e., visual and/or olfactory indicators) will be managed according to standard industry best practices defined in the Waste Management Plan during construction activities. • Stockpiled material shall be stored at a safe distance from waterways to ensure no deleterious substances enter watercourses. • The on-site and off-site beneficial reuse of excess soil will be explored by the Project team and will be undertaken in accordance with Excess Soil – A Guide to Best Management Practices (MOECC, January 2014). It is noted that the MOECC is presently contemplating the creation of a Regulation to govern excess soil management. Should this Regulation come into force within the implementation of the project the requirements will be incorporated, as applicable. • All contaminated materials will be handled according to applicable provincial and federal legislation, regulations and standard procedures. Ontario Regulation 347 (O. Reg. 347) under the Ontario Environmental Protection Act outlines requirements for on-site handling, mixing and processing of waste disposal sites and waste management systems. • The construction contractor will be required to develop and implement a site specific Health and Safety Plan and a Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals and/or spills in a timely and effective manner and to avoid soil and water contamination. • Develop and implement the site specific Health and Safety Plan and a Spill Prevention and Response Plan. <p><u>Operations</u></p> <ul style="list-style-type: none"> • If potential areas of contamination are identified during operations, further investigations will be completed to determine if contamination is present and what remedial action is necessary. All 	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> • Requirements for monitoring during active construction dewatering for any potential adverse effects will be identified during Detailed Design.

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline	Environmental Project Report Commitments	
	Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
	contaminated materials found during operation and maintenance activities will be handled in accordance with applicable provincial and federal legislation, regulations and standard procedures. • Appropriate best management practices (e.g., spill prevention and response) will be implemented during operations and maintenance to mitigate potential impacts to soil and groundwater.	
Air Quality	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> Develop a Dust Control Plan for implementation during construction. The dust control measures will conform to recognized standard specifications such as Ontario Provincial Standards Specification (OPSS) and <i>Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities</i> (March 2005), as practical. <p><u>Construction</u></p> <ul style="list-style-type: none"> Minimize by-products of combustion (NOx, CO, VOCs, and PM) from trucks or other construction equipment by ensuring that any diesel equipment complies with the latest emission standards (Tier 3 or Tier 4). Minimize dust resulting from construction activities by watering or applying other dust suppressants, covering up stockpiles, reducing travel speeds for heavy vehicles, minimizing haul distances, and efficiently staging construction activities. Further mitigate potential impacts associated with emissions from construction equipment: <ul style="list-style-type: none"> Equipment will be kept in good operating condition; Equipment idling time will be minimized; and Stationary equipment (e.g., generators, compressors) will be located as far away from sensitive receptors as practical. <p><u>Operations</u></p> <ul style="list-style-type: none"> Most pollutants show a substantial decrease in emissions after electrification. Mitigation during operations is not required. 	• N/A
Noise and Vibration	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> Develop a Construction Noise Management Plan prior to construction. The plan will include a complaint response protocol. See Section 5.4.3.1 for examples of what the plan may include. Develop a Construction Vibration Mitigation and Monitoring Plan prior to construction. The plan will include a complaint response protocol. See Section 5.4.3.2 for examples of what the plan may include. Complete a more detailed review of the individual effect of noise barriers during Detailed Design. Barrier height and effectiveness will be reviewed during the Detailed Design, as the detailed grading information is required to accurately calculate the final effectiveness of the barrier. Follow next steps in identifying what type of noise mitigation will be implemented and where, including: <ul style="list-style-type: none"> Further analysis of the noise mitigation options will be undertaken to establish what types of mitigation will be implemented and where. This will include further consideration of the administrative, operational, economic and technical feasibility as per the Protocol. Metrolinx will carry out additional public engagement once Detailed Design has progressed and updated analysis results are available. At this time, the recommended vibration mitigation is identified as the use of ballast mats, however further analysis of vibration mitigation options will be undertaken during Detailed Design to establish what types of mitigation will be implemented. A review of the vibration assessment will be undertaken during Detailed Design and vibration 	• N/A

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline		Environmental Project Report Commitments	
		Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
		<p>measurements will be completed for new infrastructure at relevant representative locations, as well as a reasonable number of additional representative receptor locations.</p> <p><u>Construction</u></p> <ul style="list-style-type: none"> While Electrification is subject to a separate standalone environmental assessment, consideration of the future electrified scenario is warranted as that is the ultimate anticipated future condition. Mitigation will be implemented for the ultimate electrification scenario. Where possible, implement a 15 m setback distance between the construction vibration source and nearby buildings. 	
Socio-Economic Environment	<i>Residential, Commercial and Institutional Uses</i>	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> The surrounding community will be notified of construction plans, as well as any modifications to these plans as they occur. Access to all residential, commercial and institutional uses shall be maintained at all times, where possible. Where this is not possible, direct consultation will occur with the affected property owners to establish a suitable mitigation strategy. <p><u>Construction</u></p> <ul style="list-style-type: none"> Mitigation measures related to noise are addressed under Noise and Vibration. Mitigation measures related to traffic and transportation are addressed under Traffic and Transportation. 	• N/A
	<i>Recreational Use, Parks and Open Space</i>	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> Metrolinx is establishing a Vegetation Compensation Protocol for Metrolinx RER projects and vegetation that is removed will be compensated for in accordance with the provisions of this protocol: <ul style="list-style-type: none"> ▪ 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 along long stretches of 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 community types/ ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final 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). The City of Toronto will be consulted during Detailed Design regarding works in the vicinity of Small's Creek with a focus on avoiding or mitigating impacts to the newly constructed stairs, boardwalk and 	• N/A

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline		Environmental Project Report Commitments	
		Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
		<p>slopes.</p> <ul style="list-style-type: none"> If property taking of public parkland is confirmed during Detailed Design, appropriate mitigation will be determined through consultation with the City of Toronto to reduce potential effects. <p><u>Construction</u></p> <ul style="list-style-type: none"> Construction adjacent to City parks will be avoided between May and September, where feasible, to minimize construction-related disturbance. Safety fencing will be used where necessary to separate the work area from pedestrians and/or cyclists. Signage indicating the presence of construction crews and/or activities will be utilized. Special directional signage may also be considered as a means to indicate alternative access routes to recreational uses and parks and open spaces. Mitigation measures related to noise are addressed under Noise and Vibration. Additional mitigation measures related to traffic and transportation are addressed under Traffic and Transportation. 	
	<i>Aesthetics</i>	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> Property requirements will be further investigated during Detailed Design The design of significant public facing retaining walls and corridor facing retaining walls that may be notable from a public realm perspective will be reviewed by the MDRP. Tree/vegetation removal as a result of this Project will be addressed and compensated through Metrolinx's Vegetation Compensation Protocol as noted under Socio-economic Environment - Recreational Use, Parks and Open Space. <p><u>Operations</u></p> <ul style="list-style-type: none"> If existing murals are degraded due to construction, reinstatement/extension of the murals will be co-ordinated with City staff and/or the local Councillor and community as appropriate. 	<ul style="list-style-type: none"> N/A
	<i>Utilities</i>	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> Utilities that cross the tracks will be reviewed with the utility owner for any works required to be undertaken to construct the fourth track and grading activities. Co-ordination will occur with each individual utility company during Detailed Design and proper crossing agreements must be agreed to by each utility. Any potential conflicts and associated mitigation measures will be identified as part of Detailed Design. See Section 5.5.4 for more details. <p><u>Operations</u></p> <ul style="list-style-type: none"> Once utility conflicts have been specifically identified and resolved, no further mitigation measures related to utilities are required for the operations phase of the Project. Potential access requirements as a result of maintenance within the Lakeshore East Rail Corridor will be determined in consultation with relevant utility owners. 	<ul style="list-style-type: none"> N/A
	<i>Property</i>	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> Specific property requirements will be determined during the Detailed Design phase. Ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures. See Section 5.5.5 for more details. 	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> A construction monitoring program will be implemented prior to construction, based on the

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline		Environmental Project Report Commitments	
		Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
		<ul style="list-style-type: none"> Specific agreements and communication with the relevant property owners will be undertaken during Detailed Design to address the need for temporary access for corridor operations and maintenance activities. <p><u>Construction</u></p> <ul style="list-style-type: none"> Access to individual properties will be maintained during construction. Effects on adjacent property owners related to construction activities (e.g., noise and vibration, air quality, traffic) will be addressed through the mitigation measures outlined in Air Quality, Noise and Vibration, and Traffic and Transportation. 	<p>recommended mitigation measures in the Management Plans developed for this Project (traffic, noise and vibration, stormwater, etc.).</p> <p><u>Construction</u></p> <ul style="list-style-type: none"> If property damage claims are received, a monitoring program may be developed during claim resolution.
	Planned Land Use	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> Metrolinx will co-ordinate with the City of Toronto and/or TRCA to consider streamlining construction timelines for efficiency, where feasible. Metrolinx will co-ordinate with City of Toronto and/or TRCA to ensure the overall intent of the Project is maintained or enhanced. 	<ul style="list-style-type: none"> N/A
Traffic and Transportation		<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> Metrolinx will co-ordinate with the City, TTC and other relevant organizations to consider and address projects proposed beyond 2018. See Section 8.2.4 for more details. The TTC will be engaged through construction meetings and advance notification of construction works will help TTC to determine if extra service, or service modification, is required. <p><u>Construction</u></p> <ul style="list-style-type: none"> Potential effects to pedestrian and cycling activities during construction will be mitigated through the installation of appropriate way-finding, regulatory, and warning signs. It is recommended that the temporary construction staging is implemented according to OTM Book 7 on Temporary Conditions. 	<ul style="list-style-type: none"> N/A
Cultural Heritage		<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> CHERs will be completed for the 11 indirectly impacted potential heritage properties during Detailed Design and provided to MTCS. HIAs will be completed during Detailed Design for any Provincial Heritage properties identified through the CHER process upon MHC determination, including the Carlaw Avenue Subway and Gerrard Street East Subway. In addition, the CHSR recommended HIAs be completed for the Designated Riverdale HCD and Proposed Queen Street East HCD during Detailed Design. These HIAs will inform appropriate mitigation measures for each specific heritage attribute. HIAs will be provided to MTCS by Metrolinx. Consultation with MTCS and/or the City of Toronto will be completed as appropriate to inform mitigation. 	<ul style="list-style-type: none"> N/A

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline	Environmental Project Report Commitments	
	Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
Archaeology	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> • If required for lands being impacted by the Project, a Stage 2 AA will be undertaken for areas that cannot be visually determined to be previously disturbed, poorly drained or steeply sloped and shall involve a property survey by the standard test pit assessment method at an interval of 5 m. Test pits that are a shovel width in diameter will be excavated 5 mm into subsoil with all soil screened through 6 mm aperture hardware cloth and all cultural material collected for analysis. If land that requires a Stage 2 AA is found to be previously disturbed, steeply sloped or poorly drained, photographic documentation of the conditions is all that is required. • Should the proposed work extend beyond the Study Area, the Stage 1 AA must be revised to determine the archaeological potential and requirement for further Stage 2 AA work of any additional lands. • In the event that Stage 1 and/or Stage 2 AA identifies potential for the discovery of an Indigenous archaeological site, Metrolinx will engage appropriate Indigenous communities to review the findings of the report and seek advice on next steps and monitoring requirements during further stages of archaeological assessment. <p><u>Construction</u></p> <ul style="list-style-type: none"> • Should previously unknown or unassessed deeply buried archaeological resources be uncovered during construction activities, they may be a new archaeological site and therefore subject to Section 48 (1) of the <i>Ontario Heritage Act</i>. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological field work, in compliance with Section 48 (1) of the <i>Ontario Heritage Act</i>. Any person discovering human remains must immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government Services. In addition, consultation with relevant Indigenous communities will be initiated in the event that archaeological resources or human remains are discovered. 	<ul style="list-style-type: none"> • N/A
Stakeholder Engagement	<p><u>Detailed Design / Construction</u></p> <ul style="list-style-type: none"> • Design and implement a response strategy to address/resolve potential construction concerns. • Maintain the Project Website throughout the Detailed Design and construction phases where the public can access updated information on the Project. • Continue discussions/consultation with local stakeholders with respect to potential impacts during the Detailed Design and construction phase, as appropriate. 	<ul style="list-style-type: none"> • N/A
Permits and Approvals Required – General	<p><u>TPAP</u></p> <ul style="list-style-type: none"> • In accordance with O. Reg. 231/08, the TPAP will be completed when Metrolinx submits a Statement of Completion to the Director and Regional Director of the MOECC, excluding any unforeseen circumstances that may require a change to the transit project. • Metrolinx may submit a Statement of Completion under the following circumstances: <ul style="list-style-type: none"> ▪ The Minister of the Environment and Climate Change gives a notice allowing the proponent (Metrolinx) to proceed with the project in accordance with the EPR. ▪ The Minister of the Environment and Climate Change gives a notice allowing the proponent (Metrolinx) to proceed with the project in accordance with the EPR, subject to conditions. 	<ul style="list-style-type: none"> • N/A

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline	Environmental Project Report Commitments	
	Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
	<ul style="list-style-type: none"> ▪ The Minister of the Environment and Climate Change gives a notice requiring further consideration of the project and subsequently gives a notice allowing the proponent (Metrolinx) to proceed with the project in accordance with a Revised EPR. ▪ The Minister of the Environment and Climate Change gives a notice allowing the proponent (Metrolinx) to proceed with the project in accordance with the EPR. ▪ The Minister of the Environment and Climate Change gives no notice within 65 days of the proponent (Metrolinx) giving Notice of Completion. <p>• In addition to the commitments to future work outlined in this table, permits and approvals obtained for the proposed works may identify the need for additional mitigation. Any additional mitigation measures required in connection with a permit or approval will be implemented.</p> <p><u>Detailed Design / Construction</u></p> <p>• It is recognized that there are overlapping timing windows and Metrolinx will consult further with the applicable regulatory agencies to determine a suitable approach for construction scheduling.</p>	
Permits and Approvals Required – Federal	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> • Where proposed works will be carried out on federal land it is anticipated that the information provided in this EPR, as well as ongoing discussions with federal agencies during Detailed Design, will provide sufficient information to address federal significance determinations under <i>CEAA 2012</i>. • For any areas identified during Detailed Design that require in or near water works, a Self-Assessment under the <i>Fisheries Act</i> will be undertaken by a qualified professional to determine appropriate mitigation measures and to confirm whether further assessment and review is required by DFO. • Prior to construction Metrolinx will review any applicable previous approvals and consider <i>NPA</i> opt-out for non-scheduled waterways. Transport Canada will be consulted as appropriate in the context of the <i>NPA</i>. See Section 8.2.1 for more details. 	<ul style="list-style-type: none"> • N/A
Permits and Approvals Required – Provincial	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> • As prescribed under O. Reg. 63/16, water-taking for construction site dewatering in excess of 50,000 L/day and under 400,000 L/day is subject to registration through EASR. In accordance with Section 34 of the OWRA, a Category 3 PTTW from MOECC must be obtained for the taking of more than 400,000 L/day of groundwater for the purposes of construction dewatering from any given source. Permitting requirements will need to be revisited closer to the construction phase when specific details such as construction timing and methods are known. Approvals for the discharge of pumped water will also be required, and could be a combination of Municipal Discharge Permits, Conservation Authority approval (through the Voluntary Project Review process), and/or MOECC ECA in accordance with Section 53 of the OWRA. A water discharge management plan would be required, as necessary, based on pre-consultation discussion with MOECC and TRCA staff since the discharge of dewatering effluent may potentially be directed to a local watercourse, depending on the baseline groundwater quality analysis results. Required discharge permits shall be prepared concurrently with the PTTW application or EASR registration. Potential effects of water taking will be assessed and strategies for mitigation will be proposed as part of the Water Taking Assessment application process, if required. • The MNRF shall be consulted at preliminary stages of the Detailed Design phase to confirm whether an authorization or permit under the ESA would be required, for SAR identified during the TPAP phase. 	<ul style="list-style-type: none"> • N/A

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline	Environmental Project Report Commitments	
	Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
	<p>Such consultation at that time will also identify any additional SAR-targeted survey requirements, mitigation and/or compensation measures and monitoring requirements.</p> <ul style="list-style-type: none"> • A Stage 1 AA was carried out for the Study Area, and this has been submitted to MTCS in accordance with Section 65 of the Ontario Heritage Act. A Stage 2 AA is recommended on any lands that will be impacted by the Project if it is shown as retaining potential for archaeological resources. MTCS staff will review and respond to additional reporting once submitted. • If any property within the Study Area becomes classified as a Provincial Heritage Property as a result of a CHER, the property will also be reviewed to identify if further heritage assessment studies are required. If a Provincial Heritage Property is identified and is contemplated for removal, demolition or transfer from provincial control, Metrolinx will engage MTCS to gain feedback and to initiate an HIA. This will be determined after the review and approval of the Metrolinx Heritage Committee. <p><u>Construction</u></p> <ul style="list-style-type: none"> • Construction of the railway expansion and construction works at the bridge locations is expected to generate excess soil that cannot be reused on site due to its geotechnical properties or quality of the excess soil. In all cases the on-site and off-site beneficial reuse of excess soil will be explored during Detailed Design and will be undertaken in accordance with Excess Soil – A Guide to Best Management Practices (MOECC, January 2014). It is noted that the MOECC is presently contemplating the creation of a Regulation to govern excess soil management. Should this Regulation come into force within the implementation of the Project the requirements will be incorporated as applicable. • If during construction, removal of SAR habitat is required, a registration of construction activity with the MNRF via Notice of Activity in accordance with O. Reg. 242/08 under the ESA is required. 	
Permits and Approvals Required – Municipal	<p><u>Detailed Design</u></p> <ul style="list-style-type: none"> • Metrolinx will adhere to the intent of the relevant permits/approvals requirements to the greatest extent possible, and will submit applications for review and information. • Metrolinx will continue to communicate and engage with the City of Toronto during Detailed Design and construction planning to ensure that any municipal concerns are addressed in the construction plans prior to commencement of construction activities, as follows: <ul style="list-style-type: none"> ▪ Metrolinx will consult with, and have regard for, the municipal planning policies with regard to specific projects (or components thereof) and will comply with the municipal requests when and where reasonable. ▪ When developing plans for new or expanded infrastructure, Metrolinx will co-ordinate with municipal staff to ensure infrastructure is constructed to meet municipal requirements to the greatest extent possible. ▪ Relocation and redesign of any municipal sewer or watermain infrastructure to avoid conflicts with the proposed works shall be in accordance with City of Toronto Design Criteria for Sewers and Watermains. ▪ Submissions relating to permits for construction within the existing road allowances will be made in accordance with municipal requirements, as applicable. ▪ Submissions for Municipal Discharge Permits for the discharge of pumped water associated with construction dewatering activities, as applicable. 	<ul style="list-style-type: none"> • N/A

Table 8-1: Summary of Future Commitments and Monitoring Requirements

Discipline	Environmental Project Report Commitments	
	Mitigation Measure (or related action) or Future Commitment	Monitoring Activity Requirements
	<ul style="list-style-type: none"> Submission relating to City of Toronto Urban Forestry By-laws will be made in accordance with City of Toronto's requirements, as applicable. Submission relating to City of Toronto Tree Protection By-laws will be made in accordance with City of Toronto requirements, as applicable. Metrolinx will endeavour to adhere to municipal Noise By-laws and policies in areas where possible. Coordination with the City of Toronto Capital Works Program will be completed for works within the vicinity of this Project. Metrolinx is establishing a Vegetation Compensation Protocol for Metrolinx RER projects and vegetation that is removed will be compensated for in accordance with the provisions of this protocol. See Section 8.2.4 for more details. 	
Permits and Approvals Required – Conservation Authority	<u>Detailed Design</u> <ul style="list-style-type: none"> Metrolinx will follow the Voluntary Project Review process as per the <i>Proponents and Projects Exempt from the TRCA Regulatory Approval Process</i> and request that TRCA reviews and comments on Detailed Design activities associated with project construction, maintenance or emergency activities. This process is applicable to areas of the Project that are located within TRCA regulatory limits. See Section 8.2.4.1 for more details. TRCA policies, programs and guidelines will be considered as appropriate through the Voluntary Project Review process during Detailed Design. 	<ul style="list-style-type: none"> N/A
Permits and Approvals Required – Utilities	<u>Detailed Design</u> <ul style="list-style-type: none"> The final assessment of utility conflicts will be reviewed in consultation with each utility company as part of Detailed Design. <u>Construction</u> <ul style="list-style-type: none"> Implementation and construction obligations will be undertaken pursuant to the crossing agreements with each of the utility companies as required. 	<ul style="list-style-type: none"> N/A
Permits and Approvals Required	<u>Detailed Design</u> <ul style="list-style-type: none"> An EEMP will be developed to outline the responsibility for carrying out monitoring and reporting activities, including the timing and frequency of monitoring activities, as well as the compliance process. The EMMP will include all mitigation measures, categorized by project phase and will identify the party responsible for implementation. <u>Construction</u> <ul style="list-style-type: none"> Implementation of the EEMP, including the monitoring and reporting activities. 	<ul style="list-style-type: none"> N/A

9. References

- Bat Conservation International (BCI), 2016:
Species Profiles. Accessed August 2016. Available: <http://www.batcon.org/resources/media-education/species-profiles>
- City of Toronto, Date Unavailable (d.u.), a:
Interactive Toronto Maps Version 2. Accessed December 2015. Available:
<http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=15dede0230460410VgnVCM10000071d60f89RCRD>
- City of Toronto, Date Unavailable (d.u.), b:
The Ravine and Natural Feature Protection Brochure. Accessed December 2015. Available:
http://www1.toronto.ca/city_of_toronto/parks_forestry_recreation/urban_forestry/files/pdf/RNFPBy-lawbrochure.pdf
- City of Toronto, Development Projects, 2016. Accessed January 2016. Available:
<http://app.toronto.ca/DevelopmentApplications/mapSearchSetup.do?action=init>
- City of Toronto, Neighbourhood Profiles, 1998-2016. Accessed January 2016. Available:
<http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=ae17962c8c3f0410VgnVCM10000071d60f89RCRD>
- City of Toronto, Official Plan, June 2015. Accessed January 2016. Available:
<http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=03eda07443f36410VgnVCM10000071d60f89RCRD>
- City of Toronto, Road Classification System Ward Map Book, 2012. Accessed January 2016. Available:
<http://www1.toronto.ca/City%20Of%20Toronto/Transportation%20Services/Road%20Classification%20System/Files/pdf/2012/wardmap.pdf>
- Conservation Ontario, 2014:
2014 Aquatic Species at Risk. Accessed November 2014. Available: <http://www.conservation-ontario.on.ca/Projects/DFO.html>
- Dobbyn, 1994:
Atlas of the Mammals of Ontario. Ontario: Federation of Ontario Naturalists.
- Environment and Climate Change Canada (ECCC), 2014:
Avoidance Guidelines – Technical Information. Accessed August 2016. Available:
<https://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=8D910CAC-1>
- Fisheries and Oceans Canada, 2015:
Species at Risk Online Mapping Tool.
- Land Information Ontario (LIO), 2015:
Metadata Tool. Accessed December 2015. Available: <https://www.ontario.ca/page/land-information-ontario>

- Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles and M. Puddister, et al., 1998:
Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southern Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.
- Marsh Monitoring Program (MMP), 2009:
MMP Participant's Handbook for Surveying Amphibians. 2009 Edition. 13 pages. Published by Bird Studies Canada in co-operation with Environment Canada and the U.S. Environmental Protection Agency. February 2009.
- North-South Environmental Inc., Dougan & Associates and Beacon Environmental, 2012:
Environmentally Significant Areas (ESAs) in the City of Toronto. Prepared for Toronto City Planning. June 2012.
- Ontario Archaeological Sites Database, 2016. Sites within a One Kilometre Radius of the Lakeshore East Rail Corridor Expansion Project. Accessed June 2016. Available:
http://www.mtc.gov.on.ca/en/archaeology/archaeology_forms.shtml
- Ontario Breeding Bird Atlas (OBBA), 2001:
OBBA Guide for Participants. Atlas management Board, Federation of Ontario Naturalists, Don Mills.
- Ontario Ministry of Municipal Affairs and Housing (MMAH), 2014:
Provincial Policy Statement. Queen's Printer for Ontario.
- Ontario Ministry of Natural Resources and Forestry (MNRF) Aurora District, 2016:
E-mail correspondence with Margaret Bérubé, Management Biologist. Received on January 26, 2016.
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2000:
Significant Wildlife Habitat Technical Guide. Queen's Printer for Ontario.
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2011:
Natural Resources and Values Information System [computer file]. Toronto, Ontario: The Ontario Ministry of Natural Resources, [2011].
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2015a:
Make-a-Map: Natural Heritage Areas. Accessed December 2015. Available:
http://www.giscoeapp.lrc.gov.on.ca/Mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2015b:
Get Natural Heritage Information (Natural Heritage Information Centre). Accessed December 2015. Available:
http://www.giscoeapp.lrc.gov.on.ca/Mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2015c:
Species at Risk in Ontario (SARO) List. Accessed December 2015. Available:
http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/MNR_SAR_CSSR_SARO_LST_EN.html
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2015d:
Species at Risk by Area Internet Tool for Toronto Region. Accessed December 2015. Available:
<https://www.ontario.ca/environment-and-energy/find-species-risk-your-area>

- Ontario Ministry of Natural Resources and Forestry (MNRF), 2015e:
Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E. January 2015. Peterborough: Queen's Printer for Ontario. 44 pp.
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2015f:
Technical Note Species at Risk (SAR) Bats. 37 pp.
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2015g:
Eastern Wood-pewee. Accessed August 2016. Available: <https://www.ontario.ca/page/eastern-wood-pewee>
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2015h:
Red-headed Woodpecker. Accessed August 2016. Available: <https://www.ontario.ca/page/red-headed-woodpecker>
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2015i:
Wood Thrush. Accessed August 2016. Available: <https://www.ontario.ca/page/wood-thrush>
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2015j:
Common Nighthawk. Accessed August 2016. Available: <https://www.ontario.ca/page/common-nighthawk>
- Ontario Ministry of Tourism, Culture and Sport, 2011:
Standards and Guidelines for Consultant Archaeologists.
- Ontario Ministry of Natural Resources (MNRF), March 2010:
Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario. 248 pp.
- Ontario Nature, 2015:
Ontario Reptile and Amphibian Atlas Program. Accessed December 2016. Available: http://www.ontarionature.org/protect/species/herpetofaunal_atlas.php
- Toronto and Region Conservation Authority (TRCA), 2007:
Terrestrial Natural Heritage System Strategy – Appendix B – Vegetation Community and Species Ranking and Scoring Method.
- Toronto and Region Conservation Authority (TRCA), 2009a:
Don River Watershed Plan: Aquatic System – Report on Current Conditions, 2009.
- Toronto and Region Conservation Authority (TRCA), 2009b:
Don River Watershed Plan: Terrestrial Natural Heritage – Report on Current Conditions and Refinement of a Target System, 2009.
- Toronto and Region Conservation Authority (TRCA), 2009c:
Don River Watershed Plan Executive Summary. 2009. Accessed December 2015. Available: <http://trca.on.ca/dotAsset/68777.pdf>
- Toronto and Region Conservation Authority (TRCA), 2016:
E-mail correspondence with Renee Afoom-Boateng, Senior Planner. Received on February 18, 2016.

