Oshawa To Bowmanville Rail Service Expansion And Rail Maintenance Facility

Transit Project Assessment Process
Environmental Assessment Study

Environmental Project Report
Volume 1 – Main Report

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AECOM

A Division of METROLINX

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2		Region of Durham
1		CP
1		CLOCA
1		MTO
1		Health Canada
1		Environment Canada
1		CEAA

Revision Log

Revision #	Revised By	Date	Issue / Revision Description
1	L. Sarris/ K. Wall	January, 2011	EPR Revisions based on MOE Comments on DRAFT Report
2	L. Sarris	February, 2011	MOE comments incorporated during 30-day review

AECOM Signatures

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Glossary of Terms

Ambient:
Environmental or surrounding conditions. Ambient air is usually outdoor air (as opposed to indoor air)**.**

ANSIs:
Areas of Natural or Scientific Interest - Represent lands and waters containing important natural landscapes or features that are important for natural heritage, protection, appreciation, scientific study or education.

CO:
Carbon Monoxide.

Conservation Area:
Lands that are considered to be regionally significant (i.e., of natural significance) that are within a Conservation Authority's jurisdiction and are managed by the Authority.

CEAA:
The *Canadian Environmental Assessment Act* is a law requiring that an environmental assessment be conducted by federal departments for projects before a federal authority take action in regards to a project.

CLOCA:
Central Lake Ontario Conservation Authority.

COSEWIC:
Committee on the Status of Endangered Wildlife in Canada - Mandated to assess and designate wildlife species that are considered to be in danger of becoming extinct in Canada.

CNR:
Canadian National Railway.

CPR:
Canadian Pacific Railway.

ELC:
Ecological Land Classification - system used to identify differing scales of landscape, or ecosystems, based on factors such as climate, landform, and vegetation.

EPR:
Environmental Project Report - A requirement under *Ontario Regulation 231/08* that documents the transit project. See **TPAP**.

Erosion:
Removal of solids (e.g. rocks and soil) in the natural environment (wind and rain).

ESAs:
Environmentally Sensitive Areas - A feature that delineates an area that has been identified to be of local interest and is designated and managed by a municipality. Such polygon features may represent the habitat of vulnerable, threatened or endangered species.

Floodplain:
Flat land adjacent to a body of water that is subject to flooding.

Future Build:
The Future Build scenarios evaluate the potential health impact to the projected air quality at the service levels projected for a given year (2015, 2031), assuming the predicting increase in rail traffic and related support structures are in place, as outlined in this document.

Future No Build:
The Future No Build scenarios evaluate the potential health impact related to the projected air quality projected for a given year (2015, 2031), in the absence of the proposed project, but assumes existing service is increased to match the capacity of the existing infrastructure.

GO Transit:
The provincial agency that governs the interregional public transit system, linking Toronto with the surrounding regions of the Greater Toronto Area (GTA).

Grade Separation:
Aligning a railway and/or roadway at different elevations so that neither one interrupts the flow of the other.

GTA:
Greater Toronto Area (i.e. Toronto, Halton, Peel, York, Durham Regions).

GTHA:
Greater Toronto and Hamilton Area (includes the GTA as described above and Hamilton).

Human Health Risk Assessment:
A risk assessment focused on estimating potential human health risks to a defined set of individuals from exposure to a particular agent or agents. The assessment process includes four (4) basic steps: problem formulation (hazard identification), exposure assessment, hazard assessment, and risk characterization.

LOS:
Level of Service - A qualitative measure describing operational conditions within a traffic stream and motorists' perceptions of those conditions.

Metrolinx:
A provincial agency tasked to improve the coordination and integration of all modes of transportation in the Greater Toronto Hamilton area.

MNR:
Ministry of Natural Resources.

MTO:
Ministry of Transportation Ontario.

NHIC:
Natural Heritage Information Centre - Compiles, maintains and provides information on rare, threatened and endangered species and spaces in Ontario. This information is stored in a central repository containing a computerized database, map files and an information library, which are accessible for conservation applications, land use planning, park management, etc. The NHIC website makes this information available through the internet**.**

NWPA:
Navigable Waters Protection Act.

NOx:
Nitrogen Oxides.

RTP:
Regional Transportation Plan - embodied in the *Greater Toronto Transportation Authority Act*, 2006 which established Metrolinx and directed it to create a long-term strategic plan for an integrated, multi-modal, regional transportation system.

SO2:
Sulphur Dioxide.

Tier 4:
The Tier 4 set of standards, which are expected to require exhaust gas after treatment technologies (such as particulate filters for particulate matter control, and urea selective catalytic retention reduction [SCR] for NOx emission control) and low sulphur diesel fuel, becomes effective in 2015.

TPAP:
Transit Project Assessment Process - Defined in sections 6 through 17 in *Ontario Regulation 231/08*. It consists of various steps and requirements. It is a focused impact assessment process that includes consultation, an assessment of potential positive and negative impacts, an assessment of measures to mitigate negative impacts, and documentation.

Underpass:
A railway or roadway that crosses under another railway or roadway.

Unevaluated Wetlands:
A significant ecological area that warrants special consideration by the Ministry of Natural Resources, excluding ANSIs, parks, and ESAs. Such areas can include old growth forests, no-cut areas, significant ecological communities and/or valleys, or in this case, unevaluated wetlands.

VOC:
Volatile Organic Compound.

Watercourses:
A series of line segments that make up a potential aquatic resource area. These areas can include both intermittent and permanent watercourses (i.e., rivers and streams).

Wetlands:
A wetland unit is seasonally or permanently flooded by shallow water as lands where the water table is close to the surface. Such units can be classified as being predominately marsh, fen, swamp, or bog.

Executive Summary

E.1 Introduction

E.1.1 Purpose of the Transit Project

GO Transit provides inter-regional and inter-municipal rail and bus transit service to passengers over long distances and is currently Ontario's only interregional public transit system that links Toronto with the surrounding regions of the Greater Toronto and Hamilton Area (GTHA). Effective and expanded public transit infrastructure will:

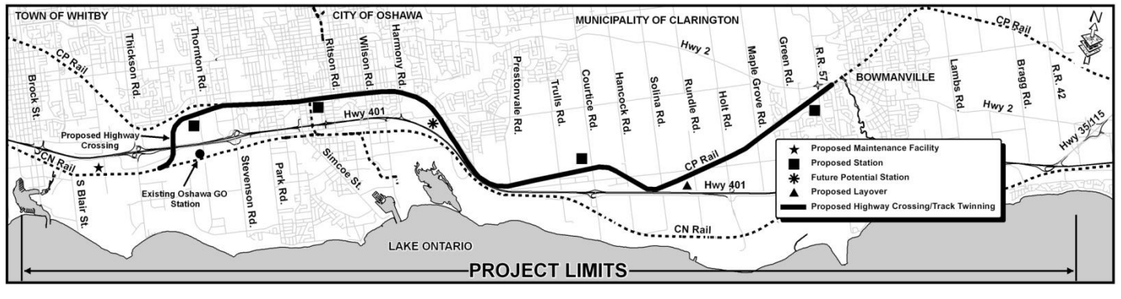
- Provide much needed new capacity in the transit systems in Ontario's urban centres;
- Manage traffic congestion, making it easier and faster to get people and goods where they need to go, and ensuring Ontario and Canada's economies remain competitive;
- Reduce Ontario's greenhouse gas emissions, cut smog and provide cleaner air to breathe; and
- Support sustainable urban development that leads to stronger, healthier communities and a higher quality of life (Transit Priority Statement, 2009).

As such, the purpose of this transit project is to provide the required infrastructure improvements to address the aforementioned transit benefits as well as to address the existing and future projected ridership demand requirements to/from Durham Region. Further to a recently completed Feasibility Study by Metrolinx for the Oshawa East track extension and new rail maintenance facility (April, 2009), the need was confirmed to expand rail services by twinning the existing Canadian Pacific Rail (CPR) line and to identify possible locations to build new GO stations, layover sites as well as a rail maintenance facility yard (AECOM, 2009).

E.1.1.1 The Project

As noted in **Figure E1-1**, Metrolinx is proposing to expand GO rail services from 500 m west of Brock Street in the Town of Whitby to 500 m east of Regional Road 42/Darlington-Clarke Townline Road in the Municipality of Clarington. As such, the approximately 25 km long Project Limits will occur in the Regional Municipality of Durham (upper-tier municipality) and the Town of Whitby, the City of Oshawa and the Municipality of Clarington (lower-tier municipalities).

Figure E1-1Project Limits



The site map above (**Figure E1-1**) illustrates the locations of each of the proposed GO facilities. A maintenance facility yard is proposed within the Town of Whitby, immediately south of Victoria Street, east of South Blair Street, west of Thickson Road, in the area of Hopkins Street, and north of the Canadian National Rail (CNR) line. Future GO services will be realigned from the CNR line to the CPR line via a Highway 401 bridge crossing.

A GO station is being proposed south of the existing CPR main line, west of Thornton Road in the City of Oshawa and will be serviced by the proposed highway crossing.

Three (3) additional GO stations are proposed through the remainder of the Project Limits with a fourth site identified for a future potential station. One (1) of which is located in Central Oshawa, bounded by south of Olive Avenue, east of Albert Street, west of Ritson Road, and north of First Street. The remaining proposed stations are located in the Municipality of Clarington. One station is proposed south of Bloor Street, east of Trulls Road, west of Courtice Road, and north of the CPR. An additional station, located in Bowmanville is being proposed south of Highway 2, west of Martin Road, and will be located on both sides of the CPR line. The fourth site, identified for a future potential station, is located east of Bloor Street and south of Grandview Drive South. In addition, a train layover facility is also being proposed within the Municipality of Clarington, south of Baseline Road, east of Solina Road, west of Rundle Road, and south of the CPR line. It is noted that that first phase of expansion will provide all day service to Central Oshawa, with a.m. and p.m. peak service to Bowmanville with the ultimate plan to have all day service to Bowmanville when demand warrants.

E.1.2 Background

E.1.2.1 The Big Move

Created by the Government of Ontario in 2006, Metrolinx addresses the urgent need to improve and integrate transportation within the GTHA, including Durham Region. Under the *Greater Toronto Transportation Authority Act* (2006), Metrolinx was established to create a long-term strategic plan for an integrated, multi-modal, regional transportation system, which promotes the integration of local transit systems with each other as well as with the GO Transit system. To this end, on November 28, 2008, the Metrolinx Board of Directors adopted the first Regional Transportation Plan (RTP) called **The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area (GTHA)**.

In the first 15 years of the RTP's implementation, significant improvements will be made to the GTHA's transportation system. To facilitate such improvements, a priority list has been developed on key regional projects that will result in substantial capacity increases, bring new rapid transit services to underserved areas throughout the region, and improve regional connectivity. Improvements to existing GO Rail services and the extension of GO Rail service to Bowmanville within the Municipality of Clarington are noted as a top transit priority. Through the extension of rapid transit, the communities located at the periphery of the GTHA will be given a viable alternative to driving and opportunities to shorten auto trips and facilitate in the reduction of congested roadways.

E.1.2.2 MoveOntario 2020

In June 2007, the Ontario government announced MoveOntario 2020, a multi-year $17.5 billion rapid transit action plan for the GTHA that will build 902 km of new or improved rapid transit. Through the MoveOntario 2020 initiative, the government announced a list of 52 rapid transit improvements and expansion projects, including the GO Lakeshore East rail line extension from Oshawa to Bowmanville. The plan calls for 66% of the projects to be completed by 2015, and 95% to be completed by 2020. In this capacity, Metrolinx will hold the responsibility for evaluating, prioritizing and recommending an implementation action plan and alterations to the MoveOntario 2020 project list, which will come from the RTP.

E.1.2.3 Municipal Transportation Policies

Durham Region Transit Long-Term Transit Strategy (March 2010)

The Long-Term Transit Strategy (LTTS) is a comprehensive plan that identifies transportation/transit challenges and opportunities within Durham Region. Completed in March 2010, the LTTS considers multi-modal transportation alternatives as they relate to, and impact transit with an overall vision statement to create an adaptive, safe, reliable, accessible, desirable transit system that shapes and connects Durham Region and beyond in an economically environmentally sustainable manner.

Through a detailed analysis of the alternative solutions, the report recommends that to best address the current problems with Durham transit service, the Region should protect for Long-Term Regional Rapid Transit Network for 2031 and beyond. It was concluded that this approach provides the best long-term, environmentally sustainable solution to help manage the Region's future growth and transportation needs as this recommendation consists of conventional and higher-order transit services. The Recommended Regional Road Transit Network Beyond 2031 illustrates a 'GO Line' extension from the CNR to the CPR Line with five (5) stations throughout the Town of Whitby, City of Oshawa, and Bowmanville. The illustrated Downtown Oshawa GO Station is also labelled as a 'Metrolinx Gateway Hub'.

Durham Region Transportation Master Plan (November 2005)

The Durham Region Transportation Master Plan (TMP) is a strategic planning document that was established to develop the transportation needs for the next 20 years and beyond. With anticipated growth, the Region will face several challenges in providing a safe, efficient, and reliable transportation system (Durham, 2005). It is noted that the community has embraced a shift towards greater use of transit, pedestrian and cycling facilities and that the changes in modal usage have been accomplished by policies that encourage higher order transit facilities linking centres within Durham and other urbanized areas in the Greater Toronto Area (GTA).

The Transit Priority Network within the TMP illustrates the Project Limits for this assignment as a 'Commuter Rail' along the CNR Corridor (i.e., existing services) as well as a 'Future Transportation Corridor', which includes the CNR to CPR Crossing and extends east beyond the Project Limits in the Municipality of Clarington (i.e., expansion of GO services to Bowmanville). 'Transportation Centres' within the 'Future Transportation Corridor' have been considered as part of this EA Study, and would serve to facilitate transfers between different modes of travel between transit services and feature passenger amenity areas and facilities. The TMP includes a recommendation action requesting GO Transit to expand commuter rail service through Oshawa along the CPR Belleville subdivision (Region of Durham, 2005). Other recommendations include introducing measures that make public transportation more attractive, improve inter-regional connections and conduct feasibility studies to examine the use of the CPR Belleville subdivision.

Town of Whitby Transportation Master Plan (June 2010)

The Town of Whitby TMP was designed to integrate both Regional and Provincial transportation and environmental planning, policies and requirements into a transportation framework for the Town (Town of Whitby, 2010). The Plan has been developed to be effective, accessible, integrated, multi-modal, balanced, sensitive, optimized, affordable, sustainable, and coordinated in order to support long-term growth and provide for efficient movement of people and goods to areas within and beyond the municipal limits.

The TMP discusses the GO Transit East Extension from Oshawa to Bowmanville. It is noted that service is planned to be expanded and enhanced, which will better enable the Region to achieve transit mode share objectives and reductions in auto usage. The Planned Transit Network Improvements illustrates a Metrolinx/GO Transit 'Potential Commuter Rail' Line crossing Highway 401 within and beyond the Town's Municipal Limits with a 'GO Train Station' at Thornton Road.

Municipality of Clarington Transportation Master Plan (Forthcoming)

The Municipality of Clarington is in the process of developing a Transportation and Infrastructure Master Plan that will include and a strategic assessment of transportation and infrastructure issues and requirements. This will assist in identifying current issues and establishing a baseline for comparison with future conditions (Municipality of Clarington Website, 2010). There is no TMP available at the time this study was undertaken.

E.1.3 Environmental Assessment Process

E.1.3.1 Ontario Regulation 231/08

In order to accelerate the delivery of critical transit expansion projects, the Province of Ontario has passed a new regulation for transit projects to ensure a streamlined decision-making process to allow for such projects to move forward quickly. As such, this study is being carried out under the Transit Project Assessment Process (TPAP) as prescribed in *Ontario Regulation 231/08*, Transit Projects and Greater Toronto Transportation Authority Undertakings (June, 2008). The regulation defines a transit project as,

"an enterprise or activity that is the planning, designing, establishing, constructing, operating, changing or retiring of (i) facility or service that … is used exclusively for the transportation of passengers by bus or rail, or (ii) anything that is ancillary to a facility or service … and that is used to support or facilitate the transportation of passengers by bus or rail…"

This TPAP process is a proponent-driven, self-assessment process and does not require that a particular project be approved by the Minister of the Environment before proceeding. The process commences with a specific transit project and the regulation does not require proponents to look at the rationale and planning alternatives or alternative solutions to public transit nor to the particular transit project (MOE, 2009). The process allows for an assessment of potential

environmental impacts to be completed within six (6) months. Although these projects are primarily proponent driven, the regulation provides a framework for focused consultation and objection processes. It is noted that the Minister of the Environment may take action on any transit project if there is a potential for negative impacts 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 (MOE, 2009).

E.1.3.2 Federal Environmental Assessment Process

In addition to complying with *Ontario Regulation 231/08*, this project may also comply with the requirements of the *Canadian Environmental Assessment Act* (CEAA). A federal EA is triggered under Section 5 of the CEAA if a federal authority proposes a project, grants money to a project, grants interest in land for a project, or exercises its regulatory duty in relation to a project.

E.2 Consultation Record

Consultation is mandatory for all projects that are subject to *Ontario Regulation 231/08*, as this process requires meaningful consultation with persons that are considered to have an interest in the transit project. Ongoing consultation throughout the transit project allows the project team to:

- Properly identify, inform or notify persons, that include those potentially affected by the transit project;
- Identify and assess the range of potential environmental impacts of the transit project; and
- Respond to the concerns of interested persons, including adjacent property owners and others who may be affected by some aspect of the project (MOE, 2009).

E.2.1 Pre-Notice of Commencement

E.2.1.1 Regulatory Agencies

As noted in **TableE2-1, a**n extensive list of regulatory agencies was established to facilitate with project input and notification. Members of the project team scheduled pre-notice of commencement meetings with relevant government agencies/municipalities with jurisdiction or an interest related to this transit project. These meetings allowed the project team to introduce the transit project to government agencies and to seek additional input on transit related issues, including environmental awareness and planning issues. In addition, a Stakeholder Technical Advisory Committee was formed to discuss additional project related issues.

TableE2-1 Regulatory Agency Contact List

Provincial Agencies	
• Committee on the Status of Species at Risk in Ontario	• Ministry of Natural Resources
• Energy and Infrastructure Ontario	• Ministry of Tourism
• Ministry of Aboriginal Affairs	• Ministry of Transportation
• Ministry of Agriculture, Food and Rural Affairs	• Ontario Federation of Agriculture
• Ministry of Tourism and Culture (formerly the Ministry of Culture)	• Ontario Heritage Trust
• Ministry of Environment	• Ontario Provincial Police
• Ministry of Municipal Affairs and Housing	• Ontario Realty Corporation
Federal Agencies	
• Agriculture and Agri-Food Canada	• Environment Canada
• Canada Post	• Fisheries and Oceans Canada
• Canadian Environmental Assessment Agency	• Health Canada
• Canadian National Railway	• Heritage Canada Foundation
• Canadian Pacific Railway	• Indian and Northern Affairs Canada
• Canadian Transportation Agency	• Parks Canada
• Committee on the Status of Endangered Wildlife in Canada	• Transport Canada
	• VIA Rail Canada
Municipal Agencies	
• Central Lake Ontario Conservation Authority (CLOCA)	• Regional Municipality of Durham (Council, Clerk, Emergency Services, Transit, Police, Works and Planning, Water & Sanitary Sewer)
• City of Oshawa (Council, Clerk, Fire, Development Services, Planning)	• Town of Whitby (Council, Clerk, Fire, Planning, Engineering)
• Municipality of Clarington (Council, Clerk, Operations, Fire, Economic Development, Planning, Engineering)	
Aboriginal Communities	
• Alderville First Nation	• Hiawatha First Nation
• Chippewas of Beausoleil Island First Nation	• Huron-Wendat First Nation
• Chippewas of Georgina Island First Nation	• Kawartha Nishnawbe First Nation
• Chippewas of Mnjikaning First Nation	• Mississaugas of Scugog Island First Nation
• Curve Lake First Nation	• Moose Deer Point First Nation
Key Stakeholders	
• Architectural Conservancy of Ontario – Clarington	• Hydro One Inc.
• Bell Canada	• Member of Provincial Parliament
• Clarington Heritage Committee	• Oshawa Historical Society
• Durham Catholic District School Board	• Oshawa Municipal Airport
• Durham College	• Port of Oshawa
• Durham District School Board	• Rogers Cable Durham Region
• Enbridge Gas Distributions	• Service Oshawa
• Heritage Oshawa	• Trans Canada Pipeline Ltd.
• Heritage Whitby	• Veridian – Clarington Hydro
	• Whitby Hydro Energy Services

E.2.1.2 Aboriginal Communities

Early consultation with Aboriginal communities is a critical part of any transit related project. As per *Ontario Regulation 231/08*, consultation with Aboriginal communities is intended to facilitate the identification of a constitutionally protected Aboriginal or treaty right that may be impacted by a transit project, and is thus considered a matter of Provincial interest (MOE, 2009).

A letter requesting a list of agencies that can assist in identifying Aboriginal communities was sent to the Ministry of the Environment (MOE), Environmental Assessment and Approvals Branch on October 2, 2009. In response, the MOE recommended the project team contact representatives from the following department listed below from the Ministry of Aboriginal Affairs (MAA) as well as from Indian and Northern Affairs Canada (INAC). As such, a letter requesting a list of Aboriginal communities was sent to applicable agency representatives on November 27, 2009. Based on information received from INAC in conjunction with additional MOE recommendations, a letter was mailed to ten (10) Aboriginal communities on July 23, 2010, who may have a potential interest in the study. The intent of the letter was to notify the communities of the project, and to request in writing, the nature of their interest and/or activities within or near the Project Limits.

E.2.1.3 Public Open Houses

Metrolinx convened three (3) public Open Houses within the Project Limits to inform the public as well as regulatory agencies about the transit project and to receive preliminary input and comments from interested and/or potentially affected parties. The public Open Houses were scheduled from June 16 to June 18, 2009, within the Town of Whitby, City of Oshawa, and Municipality of Clarington. Various methods were used to notify interested parties of the Open Houses and invite them to attend and participate. Direct notification letters were mailed out in advance of the Open Houses to applicable regulatory agencies, including municipalities on June 3, 2009. In addition, a Notice of Public Open House was published in local newspapers.

The purpose of these public Open Houses was to introduce the project and the new transit study process to landowners, municipal and provincial representatives, and other interested and/or potentially affected stakeholders. The Open Houses provided an informal drop-in centre setting whereby participants could view the display boards containing information about the project, and speak one-on-one with GO Transit and/or AECOM project team representatives. It is estimated that approximately 100 participants attended the three (3) Open Houses. Participants included regulatory agencies, Councillors, nearby residents, landowners as well as development companies.

Most participants were satisfied with the findings of the Feasibility Study as it was well thought out and covered many aspects of the project. However, some participants noted that this Study should have expanded on methodologies adopted by other Countries. A few participants expressed their concerns with the preferred methods of expanding GO services on the CPR line as opposed to the CNR line; however most participants were pleased with the expansion of GO services from Oshawa to Bowmanville and have argued that this is a long overdue initiative. Suggestions were made to electrify this line to facilitate with the overall reduction of emissions from the proposed undertaking and to adopt methods already implemented by other Countries. Moreover, some residents expressed noise, traffic, as well as future parking concerns with the proposed GO facilities.

Following the public Open Houses, a number of additional comments were received primarily through an exchange of emails. Additional members of the public requested to be added to the study mailing list, and provided insightful input on the proposed GO service expansion.

E.2.2 Formal Transit Project Assessment Process (TPAP) - Notice of Commencement

E.2.2.1 Regulatory Agencies

The list of regulatory agencies generated during the pre-Notice of Commencement stage of the EA was also used to provide agencies with the Notice of Study Commencement and Public Information Centres (PICs) and to facilitate project input. Agencies added to the contact list since the pre-Notice of Commencement phase include the Ministry of Energy and Infrastructure, Industry Canada, municipal libraries, and the Durham Region Health Department.

E.2.2.2 Aboriginal Communities

Consultation with Aboriginal communities that began during the pre-Notice of Commencement phase of the project has continued into the formal TPAP process as well. On September 24, 2010, a letter was sent to INAC and MAA agency representatives inquiring about claims within the Project Limits. Notification letters were also sent to several Aboriginal communities informing of the project and consultation opportunities. Details of communications with aboriginal communities are provided in Appendix A and B or the Environmental Project Report (EPR), Volume 2.

E.2.2.3 Public Information Centres

The Notice of Study Commencement included an invitation to participate in the formal consultation period of the study. The project team employed several methods to notify the public and agencies of the study and invite them to attend and participate in the PICs. The various methods used are as follows:

- Notice of Study Commencement and PICs sent by direct mail on Friday September 24, 2010 to regulatory agencies, the public mailing list (from the pre-Notice of Commencement phase), and property owners within 30 m of the CPR line and within 120 m of proposed station sites;
- Notice of Study Commencement and PICs sent by email on Thursday September 30, 2010 to regulatory agencies and members of the public who provided email addresses during the pre-Notice of Commencement phase;
- Notice of Study Commencement and PICs published in local newspapers (Clarington This Week, Oshawa This Week and Whitby This Week) on Thursday September 30 and Friday October 1, 2010;
- Study information and PIC invitation published on the GO Transit website on Friday October 1, 2010;
- Study information and PIC invitation distributed via the GO Transit E-News system to Lakeshore East customers on Friday October 1, Wednesday October 6 and Tuesday October 12, 2010 after the PM rush; and
- Study information and PIC invitation published on the Transit Toronto blog on Monday October 4, 2010.

GO Transit held three (3) PICs on October 7, 13 and 15, 2010 in the Municipality of Clarington, City of Oshawa and Town of Whitby, respectively. The purpose of the PICs was to present the preferred future expansion options based on public and agency input collected during the pre-Notice of Commencement phase and gather feedback on the preferred plan. It is estimated that approximately 300 participants attended the three (3) PICs; however, 278 officially signed the attendance register, including 103 in Bowmanville, 102 in Oshawa and 73 in Whitby. Such attendees included nearby

residents, landowners, developers, regulatory agencies, municipal staff, Councillors and one Mayor. A summary of comments received at the PICs is provided below.

Most respondents were supportive of the proposal to expand GO Transit rail service from Oshawa to Bowmanville. However, several respondents had specific concerns related to increased traffic and parking issues as a result of the proposed stations, especially at the Thornton Road, Ritson Road and Martin Road GO Stations. Some participants noted concerns with the preferred rail corridor, which recommends using the CPR line instead of the CNR line. Other respondents identified issues about noise and vibration as well as safety concerns. Participants raised specific concerns related to these topics while recognizing the need for expanded GO Transit service to Bowmanville.

E.3 Environmental Conditions

E.3.1 Natural Environment

Figure E3-1 illustrates the natural environmental features within the Project Limits.

E.3.1.1 Physiography, Geology and Topography

The Project Limits are directly situated within one (1) geological formation known as the Lindsay Formation. This formation, which is part of the Simcoe Group, is described as a nodular to black laminated limestone (Armstrong and Dodge, 2007). The Project Limits are situated within one (1) physiographic region known as the Iroquois Plain. The Iroquois Plain extends around the western part of Lake Ontario, from the Niagara River to the Trent River, a distance of approximately 305 km. Due to topographic features of the plain, the coarse sandy soil is not very productive and is predominately covered by cedar thicket. With the exception of the dry sandy terrace north of Oshawa, the physiographic characteristics of this Plain are generally a mosaic of till plains, drumlins, and areas of silty lacustrine deposits (Chapman and Putnam, 1984). The topography within the Project Limits are generally described as gently increasing in elevation from the proposed East Rail Maintenance Facility (ERMF) at the western limits of the study area to the eastern limits at the Martin Road Station.

E.3.1.2 Soils and Agricultural Capability

The proposed GO facilities will impact approximately nine (9) soil types within the Project Limits. The proposed track twinning will impact additional soil types within the existing CNR/CPR line Right-of-Way (ROW). Agricultural Tile Drainage (ATD) information obtained from OMAFRA identifies several random and systematic tile drainage areas within the Project Limits. Most agricultural land uses and tile drainage areas are adjacent to the CPR line and have been built outside of the CPR ROW.

E.3.1.3 Drainage and Stormwater Management

The Project Limits are entirely situated within the jurisdiction of the Central Lake Ontario Conservation Authority (CLOCA). There are nine (9) watersheds situated within the Project Limits and within each watershed there are several watercourse crossings that traverse the Project Limits. The proposed project will traverse approximately 13 watercourse crossings along the CNR line and the CPR line. Additional information received from CLOCA identifies that the CNR line to CPR line Highway 401 crossing is directly situated within the Corbett Creek 100-Year Floodplain, as per the Corbett Creek Floodplain Mapping, 2005. To this end, a Corbett Creek Watershed Flood Study was completed as part of this assignment. The purpose of this study is to establish the existing hydrologic and hydraulic conditions of Corbett Creek within the Project Limits, assess the potential impacts of the proposed connecting tracking on flooding in Corbett Creek, as well as evaluate alternatives to mitigate any potential flooding impacts.

E.3.1.4 Groundwater Resources

The influence of subsurface materials on groundwater movement necessitates a description of the geology within the Project Limits. The existing CP rail corridor is primarily located in the Newmarket Till[1]. The Newmarket Till was deposited initially into standing water by a Late Wisconsinan advance of the Laurentide Ice Sheet. It is laterally extensive within the Greater Toronto Area and extends across the entire Project Limits. The Newmarket Till has a distinct and consistent lithology[2] and is dense, stony, sandy silt diamicton, ranging in thickness from about 5 to 50 m. It occurs as beds 3 to 5 m thick, locally separated by stone lines and sandy interbeds that are 1 to 5 m thick[3]. Most drumlins within the Study Area, including those in the Bowmanville area, are composed of Newmarket Till (older documents refer to the Newmarket Till as the Bowmanville Till, although this term is no longer in use). The hydrogeological significance of the Newmarket Till is that it separates the major underlying aquifers from the permeable Oak Ridges Moraine sediments.

E.3.1.5 Fisheries Resources

Secondary background information received from CLOCA as well as the Ministry of Natural Resources (MNR) indicates that there are nine (9) watersheds and several fish species present within the Project Limits along the CNR to CPR line. In addition, the project team undertook environmental field work and prepared a Natural Environmental Conditions Report as part of this study. It is noted that the East Rail Maintenance Facility (ERMF) site as well as the CNR to CPR line crossing over Highway 401 will directly traverse Pringle Creek and Corbett Creek respectively. The remaining 11 watercourse crossings within the Project Limits will be directly traversed by the track twinning along the CPR line.

Fish species data was received from monitoring stations closest to the rail line, and proposed GO facilities. Thus, there is a likelihood of additional fish species observations within each watercourse, outside of the Project Limits.

Existing aquatic features within the Project Limits were assessed by reviewing existing data and conducting site investigations in 2009. Existing data included CLOCA fish sampling, Oshawa Creek Aquatic Resources Management Plan and the Bowmanville/Soper Creek Watershed Aquatic Resource Management Plan. Aquatic habitat assessments were not made at all watercourse crossings. Data collected in field investigations conducted by AECOM included general physical habitat, water quality and representative photographs. Ecological field investigations were undertaken along the preferred plan on July 30th, August 4th, August 12th, August 18th and October 29th, 2009.

E.3.1.6 Vegetation

Field investigation methods used to describe the terrestrial communities included a combination of Rapid Ecological Land Classification (ELC) delineation following those guidelines outlined by the MNR (Lee *et al*, 2009) for the description of vegetation communities over 0.5 ha in size, and a comprehensive floral species list. Where wetland

[1] *407 East – Environmental Assessment Report*
[2] *Sharp* et al.*., 1999*
[3] *Ibid*

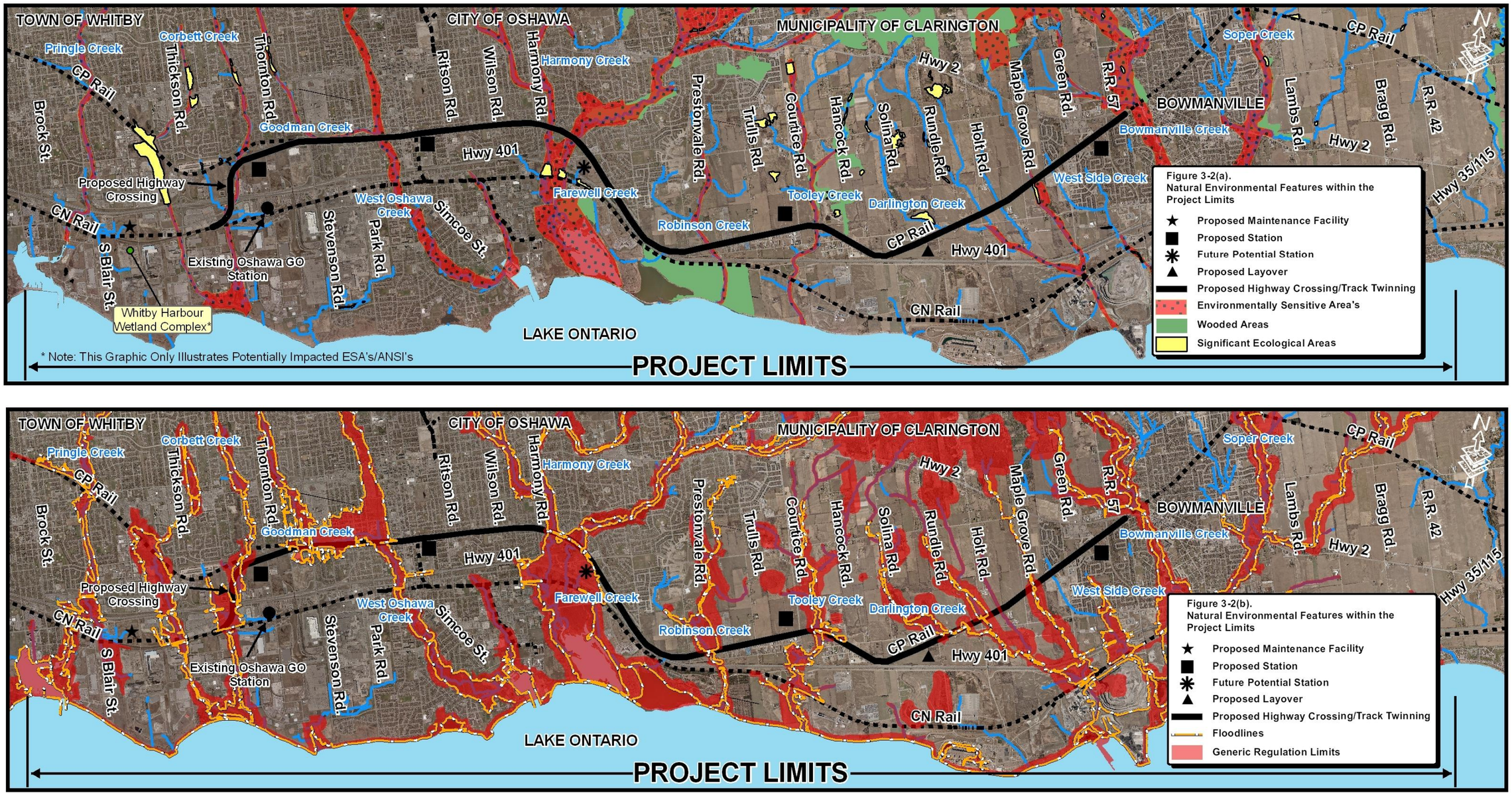
communities occur, wetland delineation according to the Ontario Wetland Evaluation System for Southern Ontario (3rd edition) was utilized to confirm/revise wetland boundaries. Ecological field investigations were undertaken by AECOM along the preferred plan area on July 30th, August 4th, August 12th, August 18th and October 29th, 2009. A Permission to Enter (PTE) agreement was forwarded to 14 land parcel owners to conduct field visits at the proposed facility sites. Field visits revealed a variety of terrestrial features on proposed facility and station sites, including agricultural fields, thickets, meadows, tree stands, hedgerows, unevaluated wetlands, PSWs, woodlands, and mowed lawns.

E.3.1.7 Wildlife

Resident wildlife within the study area dominantly consists of a composition of species able to adapt to a human influenced environment considering the proximity to major cities and transportation networks. The study area consists of two core habitat areas, the Oak Ridges Moraine to the north and Lake Ontario to the south. Additionally, large expanses of habitat associated with the former Lake Iroquois shoreline and beach have been designated as PSWs. Watercourse systems link these core areas, offering important wildlife corridors. In some areas, these corridor links are marginal due to urban modifications, which have constrained the ability for wildlife movement; however, creek corridors are still utilized by wildlife in the area.

A total of 80 federally and provincially significant species have been reported within the study area, according to CLOCA records and the NHIC database. Of these species, there are 47 bird species, 24 plant species, and nine (9) other wildlife species. Most of these species are not associated with the preferred plan. The Ontario Breeding Bird Atlas (OBBA) has recorded 162 bird species as possibly, probably or confirmed to be breeding within survey squares that overlap the study area. Of these, habitat for 98 species is not found within or near the preferred sites. A total of 66 species have habitat that is marginally suitable to suitable for breeding within or near the preferred sites where three (3) are listed as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Figure E3-1 Natural Environmental Features within the Project Limits



E.3.1.8 Species at Risk

A review of applicable background information sources was conducted to determine the potential presence of Species at Risk within and in proximity to the Project Limits. This entailed accessing and reviewing the following website registries to provide a framework for the field investigations: MNR Natural Heritage Information Centre (NHIC) database[4] for rare, threatened and endangered species; MNR Biodiversity Explorer; COSEWIC[5] database; Environment Canada's Species at Risk Registry for species protected by federal legislation called the Species at Risk Act (SARA); and Conservation Ontario 2010 Aquatic Species at Risk.

There are 23 rare species listed in the MNR NHIC database for NTS Map Sheet 30 M/15, which geographically covers the Project Limits. However, further review of the database indicates five (5) of the 23 species listed within NTS Map Sheet 30 M/15 have a mapped range within the Project Limits.

The MNR also recently introduced the Biodiversity Explorer, which is an online source for authoritative conservation information on over 15,000 plants and animals and over 450 ecological communities in Ontario (Biodiversity Explorer Website, 2009). A search of rare species was conducted through the selection of 1km squares within the Project Limits. The results of the selected squares did not include any of the above noted species as identified on the MNR's NHIC website. However, one (1) taxon group was noted within the spatial boundary, known as Ants, Bees, Wasps and Sawflies, specifically a Bumble Bee *(Bombus affinis)*. No additional ranking information was available for this species.

The Conservation Ontario 2010 Aquatic Species at Risk website identifies aquatic Species at Risk by each Conservation Authority (CA) in Ontario. Interactive maps were reviewed to determine the potential presence of aquatic Species at Risk within the Project Limits. As noted within the Distribution of Fish Species at Risk Mapping, none of the above mentioned watercourse crossings are labelled as Species at Risk (Fisheries and Oceans Canada, 2009).

E.3.1.9 Wetland Habitat

Evaluated wetlands are those that have been assessed using the Ontario Wetland Evaluation System protocols developed by the MNR. Those that have a score of greater than 600 points or 250 points within the Special Features section are considered provincially significant. For those wetlands that do not reach these scores, they are considered non-provincially significant. However, these wetlands may be considered locally significant in some municipalities.

Fourteen evaluated wetland systems occur within four (4) kilometres of the study area. Of these, 12 are considered Provincially Significant Wetlands (PSW). These wetlands are for the most part located along or near stream systems of Lake Ontario and are considered riverine wetland systems. PSWs that may potentially be affected by the expansion of rail service include Whitby Harbour PSW Complex and Corbett Creek Coastal PSW Complex.

There are a number of unevaluated wetlands of various sizes within and adjacent to the study area. Those that are identified within a given distance of a preferred site should be further examined at the detail design phase. Additional information received by the MNR has delineated a portion of lands adjacent to Corbett Creek immediately south of Highway 401 as a Significant Ecological Area. Such areas are classified as unevaluated wetlands that warrant special consideration by the MNR, excluding Areas of Natural and Scientific Interest (ANSI), parks, and Environmentally Sensitive Areas (ESA).

E.3.1.10 Designated Natural Heritage Features

Designated natural heritage features include ESAs, ANSIs, Conservation Areas and select municipal parks.

An ESA is a natural area identified by a CA or municipality as an area that fulfills certain criteria for sensitivity or ecological significance. There is one (1) PSW known as the Whitby Harbour Wetland Complex, which is located on the south side of the CNR line, immediately south of the ERMF site. In 1977, CLOCA undertook an environmental sensitivity mapping study to identify areas of sensitivity within its jurisdiction (Gartner Lee, 1978). To this end, a number of the above mentioned watercourse crossings were deemed environmentally sensitive: Pringle Creek Valley, Whitby Harbour ESA, Corbett Creek Valley, Oshawa-Goodman Creek Valleys, Harmony Creek Valley, Farewell Creek Valley to Beach, Robinson Creek Valley, Tooley Creek Valley and Darlington Creek.

ANSIs are areas of land or water that represent significant geological (earth science) and/or biological (life science) features, and are known to have a high value for conservation, scientific study, and education. Nine (9) ANSI's occur within three (3) kilometres of the study area.

Conservation areas within the vicinity of the Project Limits are owned and managed by CLOCA or the municipality. Some of these serve various recreational functions, while others have limited access in order to protect environmentally sensitive features.

The City of Oshawa purchased Cedar Valley and Harmony Valley Conservation Areas from CLOCA in 2004, now named Cedar Valley Park and Harmony Valley Park respectively. Master Plans were prepared for each park in order to define a vision and management plan for the areas. The primary goal for Cedar Valley Park is to "preserve existing natural systems and ecology", while the main focus for Harmony Valley Park is to "preserve significant natural heritage systems, and provide varied recreation opportunities" (Marshall Macklin Monaghan, 2006, May 8a; 2006, May 8b).

E.3.1.11 Air Quality

An air quality assessment was completed to predict the potential air quality impacts of the GO Transit expansion in Durham Region. The objective of the assessment was to provide a comparison of the air quality impacts resulting from the proposed expansion to an established future baseline and evaluate how the proposed expansion may potentially affect air quality in the study area. The emissions of potential concern are nitrogen oxides (NO_x), carbon monoxide (CO), sulphur dioxide (SO_2) and particulate matter (PM). Select Volatile Organic Compound (VOC) emissions were also assessed and include acetaldehyde, acrolein, benzene, 1,3-butadiene, and formaldehyde.

A general estimate of the baseline ambient air quality was made using publicly available historical air quality data from ambient air quality monitoring stations within Ontario. As part of the methodology, hourly and annual ambient concentrations of air quality emissions ($PM_{2.5}$, NO_x, SO_2 and CO) were obtained from the Toronto West monitoring station as this station portrays considerably higher ambient results due to its proximity to high density traffic corridors. Ambient air monitoring for VOCs is less common and the available monitoring stations were not close to the study area.

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[4] *The NHIC compiles, maintains and provides information on rare, threatened and endangered species and spaces in Ontario. This information is stored in a central repository containing a computerized database, map files and an information library, which are accessible for conservation applications, land use planning, park management, etc. The NHIC website makes this information available through the internet.*

[5] *COSEWIC is mandated to assess and designate wildlife species that are considered to be in danger of becoming extinct in Canada.*

Thus, the MOE's Hamilton Downtown monitoring station was chosen for ambient background Benzene and 1,3-Butadiene concentrations with additional VOC data obtained from the Windsor West monitoring station. It is noted that the monitoring stations at which these values were obtained are located in areas that are more urban and industrial than the location of many of the proposed GO stations, and may have higher contaminant concentrations than the area of interest.

In addition to the above, future traffic maps, plans and reports were reviewed to build the road networks and links around the proposed GO facilities. Sensitive receptor locations were evaluated and extracted from secondary sources and field investigations. Using the traffic information, representative emissions rates were developed for vehicular flow using MOBILE 6.2. The collected data and generated vehicular emission rates were used in an air dispersion model known as CAL3QHCR. The main inputs required for the model include, a base map of road network, the location of receptors and road segments, vehicle exhaust emission factors (i.e., g/VmT) for the road segments, the overall peak hourly traffic flow in each area, traffic signal timing used to calculate idle times and length of traffic queuing; and one year (2000) of meteorological data.

The CAL3QHCR model was run using urban settings as outlined in the US EPA document Guideline on Air Quality Models. The gaseous contaminants such as CO, SO_2, NO_x and VOCs were modelled using the CO option, while the particulate contaminants used the PM option. Presented results are based on a 1 hr, 8 hr, 24 hr and annual averaging time to facilitate comparison to the applicable guidelines. The maximum concentration predicted by CAL3QHCR is considered conservative as the maximum emission factors and peak traffic flow are used for all hours of the one-year modeling period when in reality the actual emission factors and traffic flow are frequently less (not peak). Further information pertaining to the air quality assessment, including approach, methodology, data collection, analysis, and an assessment of results is included in **Appendix E** of this report.

E.3.1.12 Contaminated Properties

Given that the Project Limits exhibit a long history of CNR and CPR freight services, sources of potential contamination including possible spills and/or leaks of oils, metals, arsenic, solvents and other petroleum product (i.e., fuels, lubricants, etc.) may exist from moving freight and/or rail equipment. Review of Schedule C – Environmental Management in the Town of Whitby's Official Plan indicates a former waste disposal site immediately south of the ERMF site on the south side of the CNR line. In addition, review of Schedule D – Environmental Management within the City of Oshawa's Official Plan indicates a Waste Disposal Assessment Area approximately 100 m south of the CPR line on the east side of Ritson Road.

Review of the Ministry of Environment and Energy Waste Disposal Site Inventory (1991) indicates the presence of a closed waste disposal site location (Site No. X 7102) in the City of Oshawa on the south side of Gibb Street, immediately east of Nassau Street and north of the CPR ROW. This waste disposal site was closed in 1921 and was classified as an A5 site, which included municipal/domestic waste in an urban setting (MOEE, 1991).

E.3.2 Socio Economic Environment

E.3.2.1 Provincial Planning Policies

Since 2001, the Province of Ontario has approved a series of initiatives, Statutes and Plans that have profoundly changed the way planning and development is to occur within Ontario. As such, the Project Limits are situated within a number of provincial planning policy areas, as described below.

The *Ontario Planning Act* (2006) sets out the ground rules for land use planning in Ontario and describes how land uses may be controlled, and who may control them. Pursuant to the *Planning Act*, the Province of Ontario is the primary planning authority in Ontario. The *Planning Act* enables the Province to delegate some of its planning authority to the upper-tier municipalities (e.g., counties and regional/district municipalities, as well as planning boards) while retaining control through the approval process. Municipalities must conform to approved policies of the Provincial government and its agencies.

The Provincial Policy Statement (PPS) is the complementary policy document to the *Planning Act*. Issued under the authority of Section 3 of the *Planning Act*, the PPS provides direction on matters of provincial interest related to land use planning and development, and promotes the provincial "policy-led" planning system that recognizes and addresses the complex inter-relationship among environmental, economic and social factors in land use planning (MMAH, 2005). The new PPS took effect on March 1, 2005, and provides for enhanced protection of the environment by identifying the significance of the natural heritage system and water resources, including natural hazards and water quality, air quality and energy use. The new policies also provide for intensifications and brownfields development to ensure the maximum use of sewer, water and energy systems, roads and transit. It also provides for more transit-friendly land-use patterns using intensification and more compact, higher density development, as a means of bringing more people closer to the transit routes (MMAH, 2005).

In recognition of the Greater Golden Horseshoe's (GGH)[6] distinction as one of the fastest growing regions in North America, Bill 136, the *Places to Grow Act*, 2005 received Royal Assent on June 13, 2005 (MPIR, 2006). The Act provides the legal framework necessary to implement the Government of Ontario's vision for building stronger, prosperous communities by better managing growth in the GGH to the year 2031. The Act enables the government to plan for population growth, economic expansion and the protection of the environment, agricultural lands and other valuable resources in a coordinated and strategic way (MPIR, 2006).

The Growth Plan envisages increasing intensification of the existing built-up area, with a focus on "urban growth centres, intensification corridors, major transit station areas, brownfield sites, and greyfields" (MPIR, 2006). The GTHA is one of the fastest growing regions in North America, as it is the destination of choice for many people looking to relocate from other parts of Canada and around the world because of its high quality of life and economic opportunities. The Growth Plan designates the Regional Municipality of Durham as an 'Inner Ring'. Moreover, Downtown Oshawa is mapped within Schedule 4 of the Plan as an Urban Growth Centre, which by 2031 or earlier, will achieve a minimum growth density target of 200 residents and jobs combined per hectare. Review of Schedule 3 – Distribution of Population & Employment for the Greater Golden Horseshoe 2001-2031 identifies Durham Region as reaching a

[6] *The GGH includes the cities of Toronto, Hamilton and Kawartha Lakes, the regional municipalities of Halton, Peel, York, Durham, Waterloo and Niagara and the counties of Haldimand, Brant, Wellington, Dufferin, Simcoe, Northumberland and Peterborough (MPIR, 2006).*

population of 660,000 by 2011, 810,000 by 2021 and 960,000 by 2031. Similarly, employment within the Region is projected at 260,000 by 2011, 310,000 by 2021 and 350,000 by 2031.

E.3.2.2 Regional Setting, Economy and Population

Durham Region is situated in the highly developed and populated economic centre of Ontario, known as the Golden Horseshoe that stretches from Oshawa to Niagara Falls. The Region is located immediately east of the City of Toronto within the GTA and is comprised of an area approximately 2,590 km² (Durham Region Website, 2009). Termed an 'emerging power' within the GTA, Durham Region focuses its economic growth on several key sectors including advanced Manufacturing, agri-business, energy, film, and tourism.

The Town of Whitby is ranked as the 10th fastest growing community in Canada and is recognized as Durham's Business Centre. Traditionally, Whitby and Oshawa have been home to a wide range of companies in the automotive, energy, information technology, manufacturing, health and government services sectors. The communities are now moving away from manufacturing to a more diverse economic base. The Municipality of Clarington includes farming communities and the hamlets of Courtice, Bowmanville, Newcastle and Orono. One of the Region's largest employers, Ontario Power Generation's Darlington Nuclear Generating Station, is located in Clarington, and the new Courtice Water Pollution Control Plant was recently constructed (Durham Annual Report, 2008).

E.3.2.3 Municipal Existing and Future Land Uses

The existing land uses within the Project Limits are primarily commercial/industrial in the Town of Whitby, urban/residential with some open space recreational and commercial land uses in the City of Oshawa, and rural/agricultural with some light commercial/industrial uses in the Municipality of Clarington. There are few sporadic residential dwellings throughout this portion of Clarington; however, there are some two-storey detached residential units in Bowmanville at the eastern edges of the Project Limits.

The Regional Municipality of Durham, Town of Whitby, City of Oshawa and Municipality of Clarington have each developed Official Plans in accordance with provincial guidelines. The purpose of policies within these Plans is to guide and manage future growth, establish policies that enhance quality of life, and to promote environmental, economic and social sustainability in each municipality. Durham Region Official Plan designations at the proposed facilities include:

- Employment Areas – ERMF, CNR to CPR Crossing, Thornton Road Station, Courtice Road Station, and Rundle Road Layover;
- Living Areas – CNR to CPR Crossing, Ritson Road Station and Martin Road Station; and
- Regional Centres – Ritson Road Station and Martin Road Station.

In addition, the Durham Region Official Plan indicates the presence of a future GO Rail connection from the CNR line to the CPR line and identifies the Courtice Road and Martin Road GO Station Sites as future GO Stations. The Town of Whitby Official Plan designates the ERMF and CNR to CPR Crossing as Prestige Industrial, Hazard Land and General Industrial lands. The CNR to CPR Crossing is also within the City of Oshawa, and is designated as Industrial and Special Purpose Commercial under the City of Oshawa Official Plan. This Plan also designates the Thornton Road GO Station Site as Industrial and the Ritson Road GO Station Site as Residential. The Municipality of Clarington Official Plan designates the Courtice Road GO Station Site as Prestige Employment Area, the Rundle Road Layover Facility as Light Industrial Area and the Martin Road GO Station Site as Town Centre and Urban Residential. The Municipality of Clarington Secondary Plan also identifies the Martin Road site as a Future GO Station Site with a Pedestrian Walkway.

E.3.2.4 Aboriginal Interests

Aboriginal peoples are important participants in the study process. Representatives from the Ministry of Aboriginal Affairs (MAA) as well as from Indian and Northern Affairs Canada (INAC) were contacted in request of a list of Aboriginal communities that may have an interest in this project. Information obtained from the INAC coupled with suggestions from the MOE regarding potentially impacted aboriginal communities identified several aboriginal communities of potential interest. As a result, the following Aboriginal communities were contacted as part of this study:

- Alderville First Nation
- Chippewas of Beausoleil Island First Nation
- Chippewas of Georgina Island First Nation
- Chippewas of Rama Indian Band
- Chippewas of Mnjikaning First Nation
- Curve Lake First Nation
- Hiawatha First Nation
- Huron-Wendat First Nation
- Kawartha Nishnawbe First Nation
- Mississaugas of Scugog Island First Nation
- Moose Deer Point First Nation

E.3.2.5 Noise and Vibration

An Environmental Noise and Vibration Assessment was prepared to assess the existing environmental noise and vibration conditions within the Project Limits and to estimate the noise and vibration impact generated by the proposed undertaking. Eight (8) noise and vibration monitoring locations were situated throughout the Project Limits to facilitate in determining the existing noise levels as a baseline assessment to facilitate the analysis. The noise and vibration assessment was carried out in accordance with the *MOEE/GO Transit Draft Protocol for Noise and Vibration Assessment*, which was developed by the Ministry of the Environment and Energy (MOEE) and GO Transit.

The noise impact generated by the proposed rail service including the noise impact generated by the proposed four (4) GO Stations were predicted to fall within the acceptable noise impact limit. In addition the vibration impact of GO Transit commuter trains was assessed and predicted to fall within the acceptable vibration impact limit. However, the noise impact generated by the proposed Rundle Road Layover Facility and the proposed ERMF were predicted to exceed the applicable noise impact limits. Additional concerns were also raised pertaining to train wheel squeal noise at/near the curved sections of the new GO Transit rail track. Thus, noise mitigation measures must be considered based on administrative, operational, economic and technical feasibility, as detailed in **Section 4.4.2.1.**

E.3.2.6 Navigable Waterways

Under the *Navigable Waters Protection Act*, approval must be obtained prior to any construction or works within designated navigable waters. Given the number of watercourse crossings within the Project Limits, a letter to Transport Canada was established to confirm the presence of navigable waterways within the Project Limits. Navigable watercourses will be identified through use of Transport Canada's screening process for navigability and through continued discussions with Navigable Water staff at Transport Canada.

E.3.2.7 Existing Traffic Characteristics

Existing traffic characteristics were considered as part of four (4) overall traffic impact studies within and adjacent to those lands proposed for future GO Transit Stations. The traffic impact studies show that most intersections within the vicinity of the proposed GO Station sites are operating at a Level of Service (LOS) 'C' or better, except those near the Ritson Road GO Station, which operate at LOS 'D' to 'F'.

E.3.2.8 Existing Businesses

It is recognized that the proposed expansion of GO services may impact/displace some existing business operations within the Project Limits as some lands are required for site facilities. A list of known businesses and/or establishments within the Project Limits that *may* be directly impacted by the proposed extension are as follows:

- East Rail Maintenance Facility – car dealership;
- CNR to CPR Crossing Site – Mini Storage, Hotel, Rental Centre, agricultural farmland (leased for corn production), commercial/residential unit, and Discount Department Store and Smart Centre;
- Thornton Road GO Station Site – Bathe & McLellan Building Material;
- Ritson Road GO Station Site – derelict Knob Hill Farms, Glass Works, Works Oshawa Plant Management, and Electric Company;
- Courtice Road GO Station Site – agricultural farmland (leased for corn production), Lumber, Kitchen & Bath Centre, Truck & Trailer business, Powers Auto Transport and Welding;
- Rundle Road Layover Facility Site – agricultural farmland (leased for cash crops), Collision and Millwork; and
- Martin Road GO Station Site – Aspen Springs Community Sales Centre, Discount Department/Hardware Stores, Shoe store, Optical business and restaurant.

E.3.3 Cultural Environment

E.3.3.1 Built Heritage

There are two (2) built heritage features within proximity to the proposed works, but neither is being impacted. The first is a home on the southeast corner of Victoria Street and South Blair Avenue and the second is the former Knob Hill Farm on Front Street, both of which are being maintained.

E.3.3.2 Archaeological Resources

A Stage 1 and 2 archaeological assessment was conducted by Timmins Martelle Heritage Consultants Inc. (TMHC) within the Project Limits, including the proposed facility and station sites as well as the Highway 401 crossing. The Stage 1 background review gathered information about known and potential cultural heritage resources based on the area's physical characteristics, historic maps, relevant documents, land use history, the provincial archaeological database and a preliminary field reconnaissance. This review indicated that the Project Limits and each of the seven (7) proposed construction properties had potential for First Peoples and/or historic era archaeological resources. Therefore, a Stage 2 field assessment was conducted, which involved a combined pedestrian and test pit archaeological assessment, using a five (5) metre interval.

During the Stage 2 assessment, no archaeological material was noted at any of the proposed facility sites except for the Thornton Road GO Station site. At this location, a total of 293 artifacts were recovered, including structural remains, table and kitchen ceramics, animal remains, metal hardware, bottle and container glass, personal items, and miscellaneous items. The site was deemed potentially significant and was recommended for Stage 3 testing, which was carried out in the fall of 2009. Since that time, the layout of the proposed Station site was changed to completely avoid the archaeological site area so it will be completely protected from impact.

It is noted that the Stage 2 assessment for the Rundle Road Layover Site has not yet been completed. Permission to access some of the parcels within the property was not granted during this study. This work will be carried out prior to construction.

E.3.4 Transportation

In Durham Region, GO Transit rail services, currently extends from Union Station in Toronto to the Oshawa GO Station along the Lakeshore East Line. The existing Oshawa GO Station has 2,424 parking spaces and is located at 915 Bloor Street West. It is shared with VIA Rail trains running from Toronto to Ottawa and Montreal. Existing rail infrastructure in the Project Limits has two (2) freight lines (CNR and CPR) and the two (2) aforementioned passenger/commuter services. Rail infrastructure is subdivided into three (3) zones. Zone 1 is from east of Brock Street to west of the proposed Highway 401 crossing along the CNR line. This zone includes GO/VIA trains and CNR freight. Zone 2 is from east of the Highway 401 crossing to west of the Ritson Road GO Station site, which only includes CPR freight. Zone 3 includes existing CPR freight services from east of the Ritson Road GO Station site to west of Bragg Road.

The CNR and CPR lines traverse a number of regional and local roads within the Project Limits, including Victoria Street, Hopkins Street, Consumers Drive and Gibb Street. Environmental Study Reports have recently or will soon be completed for each of these roads, which have/will document suggested infrastructure improvements.

Bus services within the Project Limits are provided by Durham Region Transit (DRT) and GO Transit. DRT is an integrated transit system that provides service within the three (3) municipalities within the Project Limits as well as access to other areas of Durham Region and the GTA. DRT and GO Bus Services provide transportation within and adjacent to each of the proposed GO facilities. This further promotes the respective municipal transportation master planning documents to establish an inter-connected public transit system within and beyond the Region's limits.

E.4 Recommended Transit Project

E.4.1 Alternatives Considered

E.4.1.1 Feasibility Study (Pre-EA Planning Alternatives)

The use of the CPR versus CNR line and possible station and maintenance facility sites as illustrated in **Figure E4-1** were assessed through an in-depth analysis using evaluation criteria coupled with consultation with municipalities, CLOCA, the Ministry of Transportation Ontario (MTO) and CNR/CPR. The evaluation of possible facilities was ranked in order of preference as noted in **Table E4-1**.

Table E4-1. Evaluation Ranking for the Potential GO Station Sites

Possible GO Facility Site	Ranking	CNR Possible Maintenance Facility Sites	Ranking
CNR Possible Station Sites		**CN 1 (Osbourne Road crossing Courtice Road)**	1
CN 5 (East of Martin Road)	1	**CN 2 (Crosses Bennett Road)**	2
CN 2 (Courtice Road)	2	**CPR Possible Station Sites**	
CN 3 and 4 (West and East of Martin Road)	3	**CP 5 (Martin Road)**	1
CN 6 (East of Martin Road)	4	**CP 6 (Lambs Road)**	2
CN 1 (Bloor Street)	5	**CP 4 (Courtice Road)**	3
		CP 2 and 3 (Bloor Street/Ritson Road)	4
		CP 1 Stevenson Road	5
		CPR Possible Maintenance Facility Sites	
		CP 2 (Rundle Road)	1
		CP 3 (Providence Road)	2
		CP 1 (Prestonvale Road)	3

The results from these evaluations were then considered as part of the overall CNR/CPR rail corridor evaluation, which was separately assessed with pre-defined evaluation criteria, which is further documented in **Table E4.2**. In consideration of the above analysis/evaluations and discussions with regulatory agencies, it was determined that the CPR corridor best presents overall service to the community (AECOM, 2009). In addition, the route selection study recommended the CPR line based on:

- Enabling communities to further provincial goals of land use intensification and long range transit integration;
- Best in meeting municipal transportation and land use planning goals/objectives;
- Best at offering ability for residents to use transit between home and train; and
- Best in aiding communities in revitalizing central areas.

As a separate undertaking, GO Transit retained Hatch Mott MacDonald to conduct a Feasibility Study for a new rail maintenance facility. As noted in the June 2009 report, the study was initiated to consider a new facility along the Lakeshore East corridor between Union Station and the existing Oshawa GO Station. GO Transit's existing rail maintenance facility at the Willowbrook Yard has reached operational capacity with no room for further expansion. In consideration of seven (7) sites, Site 'G' within the Town of Whitby was chosen as the preferred alternative. All alternatives were screened from a list of evaluation criteria including available property, property characteristics, proximity to Union Station, compatible land use/zoning, infrastructure impacts/upgrades, functional sustainability, impact on neighbouring areas, social impacts, and environmental impacts (Hatch Mott MacDonald, 2009).

E.4.1.2 Design Alternatives

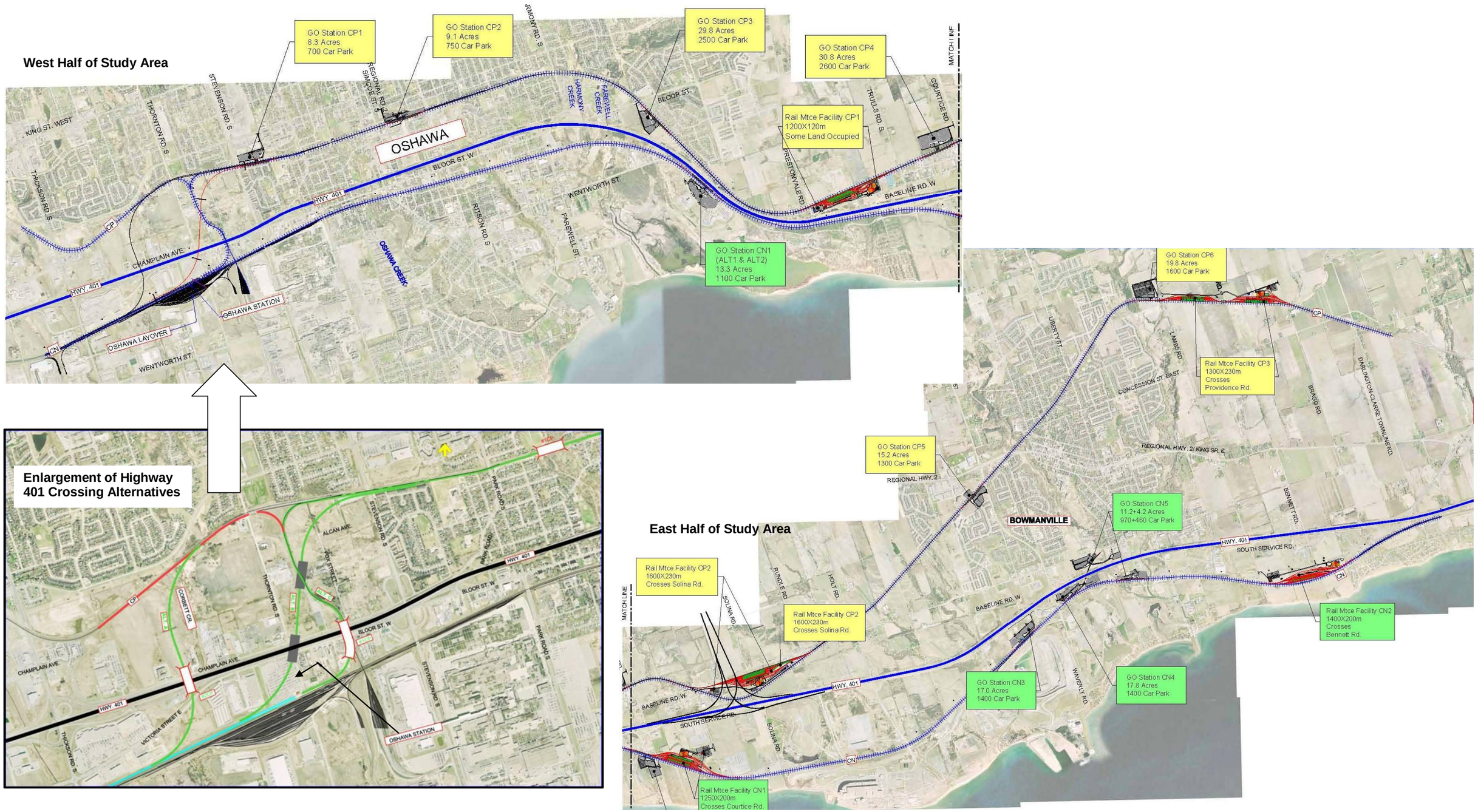
Through ongoing consultation with respective regulatory agencies, extensive input was obtained to confirm the recommended transit project. During the early phases of this study (i.e., pre Notice of Commencement), six (6) alternative GO Station sites were presented as alternatives to regulatory agencies, municipalities and the public to seek input on alternative station sites within the preferred CPR corridor. It is noted that regulatory agency preference given to these sites was considered with respect to provincial/municipal land use planning policies, environmental issues, as well as socio-economic considerations and technical analysis of each site. The alternative GO Station sites that were evaluated are:

- Stevenson Road (Oshawa) – **not carried forward** due to environmental concerns, proximity to built up areas and commercial land uses, and access and size constraints.
- Ritson Road (Oshawa) – **carried forward** because of good access and space for parking, proximity to downtown, planned rapid transit corridors, and the reuse of a derelict property.
- Bloor Street (Oshawa) – **carried forward** as a **future potential site** with long-term potential as an eastern gateway to Oshawa to be developed when other stations reach capacity.
- Courtice Road (Clarington) – **carried forward** because of minimal environmental concerns, good access to Highway 401 and facilitates planned future growth in the area.
- Martin Road (Clarington) – **carried forward** because it complements transit development outlined in the Metrolinx RTP, it is close to major transportation routes and progressive urban development, and has a low environmental impact.
- Lambs Road (Clarington) – **not carried forward** due to environmental concerns, the bridge over Bowmanville Creek, potential noise impacts, and its location outside of the urban boundary.

Table E4-2 CNR versus CPR Mainline Advantages and Disadvantages

Evaluation Criteria	CNR Mainline		CPR Mainline	
	Advantages	Disadvantages	Advantages	Disadvantages
Station Sites		- Does not support station sites	- Facilitates station site development	
Station Terminus Sites		- Does not facilitate station terminus sites	- Supports station terminus sites	
Municipal Support		- Is not preferred by municipalities	- Municipalities support this option	
Socio-Economic Impacts	- Has slightly fewer direct residential impacts	- Impacts more commercial properties - Does not meet community planning objectives - Does not create community improvements	- Has fewer impacts to commercial areas - Meets community planning objectives - Provides good potential for community improvements - Transit availability	- Has more potential to impact residences, but impacts can be mitigated where warranted
Proximity Impacts	- Less potential for visual, noise and vibration impacts to residences			- Slightly more potential for visual, noise and vibration impacts to residences, but changes to views are minimal since existing rail corridor is being twinned and noise impacts can be mitigated where warranted
Impact on Future Land Use		- Does not support future residential or commercial intensification - Does not fit into community	- Facilitates better intensification of residential and commercial land uses - Fits better into community	
Patron Access/Egress		- Does not offer good regional access for local transit or automotive traffic - Does not offer good local access for cyclists or pedestrians	- Provides good regional access for local transit and automotive traffic - Provides good local access for cyclists and pedestrians	
Road and Traffic Impacts	- Less traffic impact on secondary roads	- Greater traffic impact on main roads - Does not provide adequate number of access points to stations - Does not enable mobility hubs	- Less traffic impact on main roads - Provides good number of access points to stations - Enables mobility hub development	- Slightly greater traffic impact on secondary roads
Environmental Impacts		- More potential for negative impacts on wildlife associated with watercourses and wetlands along northern shoreline of Lake Ontario	- Less potential for negative impacts on wildlife, further upstream of Lake Ontario	
Probable Cost	- Lower cost for rail corridor infrastructure - Lower cost for property acquisition	- Higher cost for parking lots - Higher cost for road works	- Lower cost for parking lots - Lower cost for road works	- Higher cost for rail corridor infrastructure - Higher cost for property acquisition
Logistical Challenges	- Eliminates the need for the CNR to CPR connection - Fewer logistical issues for terminal station operations	- More conflicts with VIA operations - More impact of a second mainline	- Fewer conflicts with VIA operations - Less impact of a second mainline	- Creates challenges with the CNR to CPR connection; however, many of these issues have already been identified and addressed - Issues surrounding terminal station operations
Overall Summary	**Not Preferred because:** - Does not support station site or terminus site; - Does not facilitate long-term goals of community improvement and revitalization; - Does not fit into the surrounding community; and - Does not offer good access for local transit, automotive traffic, cyclists or pedestrians.		**Preferred because:** - It enables communities to advance provincial goals of land use intensification and long range transit integration; - Best in meeting municipal transportation and land use planning goals/objectives; - Best at offering ability for residents to use transit, cycle or walk between home and train station; and - Best in aiding communities in revitalizing central areas	

Figure E4-1 Potential GO Transit Station, Layover and Highway 401 Crossing Alternatives Considered



Similar to the evaluation of alternative GO Station sites, consultation with respective regulatory agencies/municipalities was also conducted to seek input on alternative layover sites. Three (3) alternative GO layover sites were presented as alternatives to confirm/augment the preferred recommended project. The Alternative GO Layover sites that were evaluated are:

- Prestonvale Road (Clarington) – **not carried forward** primarily due to property/business impacts.
- Rundle Road (Clarington) – **recommended to be carried forward** as the site best suited for the area, although it was moved from the north to the south side of the CPR line in order to minimize impacts to existing and proposed commercial/industrial areas.
- Providence Road (Clarington) – **not carried forward** since it is designated for future residential land uses as well as nuisance concerns with residents and special interest groups.

Three (3) alternatives for the CNR to CPR line track connections to cross Highway 401 were presented at the first round of public Open Houses in June 2009.

- Alternative A Connection (elevated crossing of Highway 401) – **carried forward** primarily because it enables CPR to continue to use its General Motors (GM) Spur line to the south without potential for future interruptions.
- Alternative B Connection (subway crossing of Highway 401) – **not carried forward** due to significant disruption go Highway 401 traffic during construction and very expensive to deal with parking arrangements during construction.
- Alternative C Connection (elevated crossing of Highway 401) – **not carried forward** primarily because of the potential to impact use of the CPR GM Spur line.

E.4.2 Description of the Recommended Transit Project

This project consists of two (2) major elements. The first is the establishment of a major rail maintenance facility at the west end of the Project Limits. The second element is the extension of GO Train Service on the GO Transit Lakeshore East corridor from Oshawa to Clarington. Both of these elements will enable GO Transit to expand its service on the Lakeshore East corridor and position them to meet the growth in commuter rail service throughout its service area with the addition of a second major rail maintenance facility to care for the growth in rail equipment to meet this demand.

E.4.2.1 East Rail Maintenance Facility

The East Rail Maintenance Facility (ERMF) will be designed to Leadership in Energy and Environmental Design (LEED) standards by utilizing environmentally friendly building practices during design and construction. This facility will be developed to significantly increase GO Transit's ability to handle the rail equipment maintenance requirements for the future. Initially GO Transit established one such rail equipment maintenance facility in Etobicoke. With the present and future plans for expansion of the GO train system, it is now necessary to establish a second maintenance facility. The location of this site enables GO Transit to develop a balanced approach to rail equipment maintenance. In addition, GO Transit will be in a better position to manage the regulated inspections and maintenance on the entire train fleet once these two facilities are in operation.

This facility will cover approximately 30 ha of land and will employ approximately 300 people in many types of work from heavy mechanics to cleaning staff to train operators and other types of work. The design of this facility will enable GO Transit to rebuild its engines and coaches, paint its equipment, wash its equipment on a regular basis, undertake regulated inspections and light maintenance and repair, and repair and replace train wheels. The facility will have stores for supplies and office space for the management of this facility. Trains will be fuelled here and approximately 18, 12-car train sets will be able to be stored here and put onto electrical land lines and turned off when not in use. From this rail yard, locomotives will be started and the trains sent into revenue service. This will enable train operators or crews to start and end their day from the crew center in this facility.

The rail infrastructure to support all of this activity will stretch from Victoria Road in the west to Thickson Road in the east. As part of the design for this facility, GO Transit has undertaken measures to provide a rail/road grade separation at South Blair Road. This railway bridge will accommodate the entire existing track requirements across this road as well as two (2) tracks associated with this facility's rail yard. The new grade separation at South Blair Road will improve existing conditions and eliminate the need for train whistles at the current at grade crossing. In addition the preferred plan includes removing the existing structure on Hopkins Street (over the existing rail line) and building a new access road to the existing businesses at the end of the street. The new access point will require a laneway to be constructed that connects the business area with South Blair Road, south of the rail maintenance facility site and rail corridor. GO Transit is working closely with the Region of Durham and the Town of Whitby to make sure the proposed road connections are compatible with the local road network and land uses in the immediate vicinity and designed to meet municipal standards. If during detailed design additional land is required for any aspect of this facility and its road impacts, GO Transit will work with the land owners affected to resolve the matter satisfactorily.

The rail maintenance facility site will be re-graded to enable the train yard to be built below the entrance points in a dished fashion. This will allow the safety feature of ensuring the rail equipment will be contained within the facility and the buildings can be established at much the same level so the rail equipment can access them as required.

E.4.2.2 Train Service Extension to Clarington

To meet the requirements of extending GO Train Service to Clarington, additional track capacity will be necessary at each step of service growth. The initial train service extension plan will consist of running full daily train service to the Ritson Road GO Station and extending the peak hour trains further to the Martin Road GO Station. This will generally require two (2) tracks worth of capacity to handle the full service plan with one (1) track worth of capacity over the remaining section for Phase I. Phase II will be implemented at such a time when full service to Bowmanville is warranted. This will be over and above the existing amount of track capacity within the CPR corridor. A second condition is that the freight and commuter train service must not interfere with each other during normal operation. In this way, the tracks within the CPR corridor will be delineated so that the tracks to the north of the track infrastructure will be used primarily by freight train service and the tracks to the south will be used primarily by the commuter rail service.

E.4.2.3 Full Train Service Requirement to Ritson Road GO Station Site

To achieve this service plan, GO Transit plans to terminate its train service operation at the existing Oshawa GO Station and relocate it to the new full service terminus station at Ritson Road on the north CP Rail corridor. Two (2) tracks will turn to the north and rise up to cross over the fully planned Victoria Road then over the truck inspection Highway 401 entrance ramp and the Thickson Road Highway 401 entrance ramp. At Highway 401 the double track will continue over the fully planned expanded Highway 401 and Consumers Road to then run along the ridge to the west of

Corbett Creek. This double mainline will then cross over the planned Champlain Avenue as it turns to the east through the open fields to pass through the new line point GO Station west of Thornton Rd. and passes under Thornton Road leaving the road profile as it is today.

These two (2) tracks will pass between two (2) hydro pylons well below clearance requirements as they approach the CPR/GM Spur at the apex of the Wye configuration. Once these two (2) tracks have passed under the GM Spur, they will then rise to ground level and enter the CPR corridor just to the west of the Stevenson Road overhead bridge. Once within the CPR corridor, these two (2) tracks will pass under the Stevenson Road and Park Road overhead bridges along the south side of the rail corridor adjacent to the existing tracks in the corridor. In addition, the CPR mainline and passing track will be moved north by one (1) track center until they approach the Oshawa Creek bridge. At this location the CPR mainline will return to its original alignment and the two (2) GO Transit tracks will resolve into one (1) track.

The railway bridge over Oshawa Creek will be expanded by one (1) track along the south side of the existing bridge. Between the Oshawa Creek railway bridge and the east side of the Ritson Road GO Station site, one (1) additional track will be built along the south side of the existing track. Through the Ritson Road GO Station site, this second mainline will remain next to the existing mainline. Immediately east of Albert Street, a station track will be built to the south of the new commuter rail track and will divert to the south away from the other tracks to establish an island platform between these tracks where the Ritson Street GO Station will be established. This station track will extend from Albert Street to west of Wilson Street and serve as a staging track for the full train service arriving and departing from this station.

The development of the double mainline over Highway 401 and through the field then under the GM Spur before entering the CPR corridor will facilitate the separation of freight and commuter train service. CPR freight service will operate on the northern side of the track structure and will not be affected by the movements of the commuter service. As the CPR freight service needs to access and egress the GM Spur, the commuter service will pass under their activities and not impact their service to the GM complex south of the CNR corridor. For the rest of the CPR corridor the plan of freight activities to the north side of the track infrastructure and commuter service to the south, will continue and in this way ensure that neither train service will conflict with the other over this territory.

E.4.2.4 Peak Train Service to Clarington

Between the Ritson Road GO Station site and the Martin Road GO Station site, one (1) additional track will be built to meet the condition of having the two (2) train services separated and not in conflict with each other. To achieve this and to protect this plan, tracks will generally be built to the south side of the existing CPR line. A new station will be established at Courtice Road and a terminus station in Bowmanville at the intersection of County Road 57 and the CPR corridor. This terminus station and tail track back to the east side of Highway #2 Bridge (King Rd) will be the end of additional track building for this peak period of service. In the future as full service plans are warranted, a second new track will be required from the Ritson Road GO Station site to the Martin Road GO Station site to accommodate the extension of full daily train service to Bowmanville.

The extension of GO Train Service to Clarington also requires the establishment of a train layover site near the end of service, to park trains overnight and facilitate minor maintenance. This project has selected a site adjacent to the rail corridor between Solina Road and Rundle Road. It is planned that this site will start service with rail infrastructure to store four (4) or five (5) trains overnight to meet the initial peak period service plan to start service from the Martin Road GO Station site. To provide enough track capacity to move trains between this layover site and the end of service terminus at Bowmanville at the same time as revenue train service runs between Bowmanville and Union Station, a service track will need to be provided to link these two (2) sites. This will add a second new track between these two (2) sites.

Within the CPR corridor, the additional roadbed for new track will generally be built adjacent and contiguous to the existing CPR track bed. As this construction crosses various watercourses, the existing culverts and bridges will be extended in kind by approximately 25 feet to accommodate the roadbed and eventual track system. As required by CLOCA, MNR and Fisheries and Oceans Canada (DFO), GO Transit will provide the required details for each watercourse crossing and obtain appropriate approvals were required to proceed.

E.4.2.5 GO Train Stations

The extension of GO Train Service from Oshawa to Bowmanville will be developed with the associated four (4) new GO Train Stations to be opened upon the opening of this new extended train service. In addition, one (1) potential future GO Train Station is proposed to be opened when demand warrants the need for the additional station. Each station location was selected to provide communities (i.e., Whitby, Oshawa and Bowmanville) with a convenient point of connection with the GO train system. Site locations were selected to balance the service to the present and future communities and enable greater linkages between transit systems which will ensure greater possibility for people to use transit to their advantage and link directly and easily to the rest of the GTHA through the services of GO Transit. Each station will provide grade separated pedestrian access to the train platform and will enable full accessibility flow between the station grounds and the trains, following the accessibility policy of GO Transit.

In general, each of the four (4) station sites selected will not directly impact watercourses within the area although they will require paved parking lots for their parking patrons, station facilities, walkways and station platforms. The proposed works include storm water management and drainage facilities to ensure that runoff is properly managed. It is noted that during detail design, storm water issues will be addressed within the LEED design work.

Thornton Road GO Station Site (Thornton's Corners)

The proposed Thornton Road GO Station, referred to as Thornton's Corners, was not considered during the 2009 Feasibility Study. The Town of Whitby recommended that this site be considered as part of this EA given that Consumers Drive will be extended through this area. Whitby planning staff felt that connecting the eastern portion of Whitby and the western portion of the City of Oshawa could provide better service.

This station site is located on Thornton Road just south of the CPR rail corridor. With the establishment of this station, GO Transit will relocate its present Oshawa Station services to this location. This new station will provide full train service for users from the western portion of Oshawa and the eastern portion of Whitby. Parking will be comparable to that presently supplied at Oshawa GO Station and will offer approximately 1,525 parking spaces with opportunities for future parking expansion to the west of the proposed parking lot. The GO Station will also provide bike shelters, a bus loop and handicapped parking spaces adjacent to the station building. Transit service will be provided along with "Kiss and Ride" capacity. Over time, this station will be serviced by the extension of Consumers Drive from the west and will enable greater service to the area.

The existing Oshawa GO Station on the south side of Highway 401 will be phased out of service when the new stations are built and put into service. It will remain as a VIA Station south of Highway 401.

Ritson Road GO Station Site (Oshawa GO Station NEW)

Located just south of the center of Oshawa, this station, referred to as Oshawa GO Station (NEW), will enable the City to develop an increasing series of linkages between the GO train system and other forms of transit. The proximity of this station to downtown Oshawa has some potential to stimulate redevelopment of the general area.

This station will utilize the former rail yard property north of the operated CPR corridor between Front Street and Ritson Road. This north portion of the station grounds will facilitate access from the Gibb/Olive roadway and provide initial bus access to the station along with "Kiss and Ride" facilities and some parking. On the south side of the tracks, GO Transit plans to transform the old Knob Hill Farms site into its station facility including the majority of parking and some "Kiss and Ride" facilities. There will be approximately 1,228 parking spaces on the south side with opportunities for future parking expansion on the east side of the property.

GO Transit plans to work with the City in preserving the oldest building façade section along Front Street as a preservation of a part of the City's history in this area. This station will include a center island platform and a south side platform next to the station track. GO Transit intends to install two (2) pedestrian tunnels at this station. One (1) will be along the alignment of Front Street and provide dual capacity of enabling pedestrians to continue to use the pedestrian walkway along Front Street and also enable riders to access the west end of the GO Platform and the GO System. The second tunnel will facilitate access to the island platform from the station grounds and enable patrons with accessibility requirements to move easily between the trains and the parking and bussing areas of this station.

Bloor Street GO Station Site (Grandview GO Station)

This station site, referred to as Grandview GO Station, has been identified as a future potential station that will be developed when the other stations (i.e., Thornton's Corners and Oshawa NEW) are at or over capacity. It is identified as part of this EA as a future long-term option. Additional studies on addressing impacts of construction at this site will be carried out prior to construction.

Courtice Road GO Station Site (Darlington GO Station)

This station site, referred to as Darlington GO Station, is located between the main downtown areas of Oshawa and Bowmanville in an area that is planned to develop over the next few years and with direct access to Highway 401. As many riders of the GO system come from communities farther to the east, this station will provide them with a convenient and direct access point to the system. It will enable riders from the east to utilize Highway 401 to this point and give them direct access to this station location and entrance to the GO train system. The main station facilities will be located to the north of the CPR corridor. This will include a station building and parking facilities along with a bus access point and "Kiss and Ride" facilities. At track side GO Transit will install a pedestrian tunnel to access a south side Station platform. Parking facilities include 1,100 spaces with opportunities for future parking expansion to the west of the proposed parking lot. Initially this will be a side platform but as train service grows and full service develops this platform will expand into an island platform to service two way train traffic along the south side of the corridor.

Martin Road GO Station Site (Bowmanville GO Station)

At present this station consists of a GO bus terminal on the north side of the rail corridor, which services GO ridership and provides GO patrons with bus service to the GO train system at the present terminus in Oshawa. With the extension of train service this station will be redeveloped into both a train and transit hub for both the GO System and local transit. It will be referred to as the Bowmanville GO Station. On the north side of the corridor, GO Transit will redevelop the land to accommodate a bus terminal along with a "Kiss and Ride" facility and 80 parking spaces. This bus terminal will enable municipal and regional transit to access the train station and interchange patrons at the facility.

On the south side of the rail corridor GO Transit will develop a large parking facility along with "Kiss and Ride" features and expansion capability as the demand at this terminus station grows. This station will initially provide a south side island platform between the mainline and the south service track. As train service grows into full service the south service track will be upgraded into a south mainline. GO Transit will work with the community to ensure that general pedestrian crossing of the rail corridor will be directed safely across its grade separated pedestrian crossing. Within the southern portion of the station site, there will be an additional 770 parking spaces.

E.4.2.6 Rundle Road Layover Facility Site

The train layover site recommended for this extension of train service sits adjacent to the CPR corridor along the south side between Rundle Road and Solina Road. It will initially be developed to provide for five (5) 12-car GO Trains to be parked. Each train will be stored in the train yard and plugged into electrical service and the engines will be turned off when the train is in storage. Each morning the trains will be started up and warmed prior to being put into service. From this location these trains will normally move east to the Bowmanville GO Station site to begin revenue service into Union Station. At the end of the day trains will return patrons to Bowmanville in revenue service and upon completion of this service, move as equipment service back to the Rundle Road Layover Facility. During the initial service plan these trains will be given light maintenance at this site. The cleaning up of garbage, some cleaning of the interior of the train as needed, minor parts replacement etc. will be handled at this site. Train fuelling will also be provided at this facility.

As train service expands, this facility will fill out to its full plan, with a train yard capable of handling eight (8) trains for storage. In addition, a Progressive Maintenance (PM) building capable of housing two (2) 12-car trains and engine side by side inside may be added. This PM Bay will provide the ability to undertake regulatory inspections of each train as required. As a result of these regulatory inspections some minor maintenance, fuelling and repair will be undertaken. This will also enable other quick repairs to be undertaken during the same inspection period. As GO Transit train service grows throughout the system, it will become increasingly difficult to cycle equipment sets to major maintenance facilities for the required regulatory inspections. Therefore GO Transit has planned that all of its layover facilities will have the capability to undertake these inspections on the required frequencies and follow up with the immediate light repairs required. Should more demanding and time consuming repairs be required then the trains will be moved to the main repair shops for this work to be undertaken.

E.4.2.7 Structural Improvements

Given that the above noted facilities and the track twinning will traverse several municipal roads and watercourse crossings, some improvements to the existing bridges within the Project Limits are required to facilitate additional train movement without interrupting the existing CPR freight services. In addition, some structural improvements in the form

of concrete box/arch culverts are required over watercourse crossings, including the Corbett Creek Floodplain, which is situated within lands, proposed for the CNR to CPR line crossing over Highway 401.

E.4.2.8 Corbett Creek Watershed Flood Study

Given that the proposed Highway 401 CNR to CPR crossing site will traverse Corbett Creek, within its floodplain, the study included a Corbett Creek Watershed Flood Study. As noted therein, the proposed connecting track will extend from the CNR corridor east of Thickson Road to the CPR corridor west of Stevenson Road. A single large bridge will carry the connecting track over Victoria Street and Highway 401. The connecting track will also traverse the future Consumers Drive, Thornton Road and the CPR spur line east of Thornton Road.

The proposed alignment crosses Corbett Creek at three (3) different locations; the first (and most significant) is the crossing south of Victoria Street, which is mostly within the regional storm floodplain. The second crossing is located north of Victoria Street and does not warrant any analysis as it is located under the proposed bridge that will carry the tracks over Victoria Street and Highway 401. The third crossing occurs west of Thornton Road and north of the future Consumers Drive extension (AECOM, 2010).

In order to prevent the proposed GO connecting track from becoming a restriction to flow in the event that the existing CNR culvert is enlarged, two (2) +/- 11 m Conspan or equivalent culverts are recommended for the proposed south Corbett Creek crossing south of Highway 401.

The proposed connecting track between the CNR corridor and Victoria Street will require 60,000 m^3 to 90,000 m^3 of fill in the regional storm floodplain for the embankment, depending on the steepness of the embankment side slopes. This fill volume has the potential to increase 100 year storm flood levels by 0.3 m to 0.45 m, and to increase regional storm flood levels by 0.2 m to 0.3 m. The impact on flood levels can be mitigated if steeper 1H:1V side slopes are used for the embankment, and the floodplain on both the east and west sides of Corbett Creek are re-graded to create 60,000 m^3 of offsetting flood storage.

The second East Corbett Creek crossing is located immediately north of Victoria Street. A continuous bridge is proposed to cross over Victoria Street, East Corbett Creek and Highway 401. No impacts on flooding in East Corbett Creek are anticipated (AECOM, 2010).

The final crossing of East Corbett Creek occurs between the future Consumers Drive extension and the CPR corridor west of Thornton Road. A 9.75 m Conspan or equivalent culvert is recommended at this location to prevent any impacts on upstream flooding. It should be noted that during detailed design, the Flood Plain Mapping and flood storage areas will be refined and presented on full size drawing plates. Plans for a one year monitoring water quality program (prior, during and post construction) will also be prepared at the detailed design stage, and monitoring locations will be indicated on the drawing plates.

E.4.3 Implementation and Construction Staging

E.4.3.1 Implementation

With the approval of this EA, GO Transit will proceed to seek the required funding from the provincial government to undertake the proposed works. When funding is secured, the next step will be to begin the detail design of the many elements of this project. GO Transit will continue to consult with municipalities, agencies and property owners directly affected by the project during detail design regarding several aspects of the final design including additional land requirements temporarily and permanently, mitigation of impacts at watercourses or other sensitive areas, drainage and storm water management, traffic management (long-term and during construction), construction staging, communications with public and other approvals that may be required (i.e., DFO, Navigable Waters, Canadian Transportation Agency, etc.). Commitments to address all outstanding issues are described in greater detail in the following sections.

E.4.3.2 Construction Staging Overview

It is recognized that the construction timing for some of the key elements of this project will require significant time to complete. It is anticipated that the contract for the GO Transit ERMF will start early in the project (i.e., detail design currently planned to start in 2011) and take approximately three (3) years to complete construction. As it is a standalone element it is expected that the completion of this work will finish well before the introduction of the new train service extension to Clarington.

Of the other main project elements, it is expected that building of the new double track roadbed between the GO Transit corridor and the CPR corridor will be initiated first with the associated bridges built in order. Within the CPR corridor, roadbed grading may start in Bowmanville and work its way towards Oshawa since no significant structures are encountered until Farewell and Harmony Creek crossings. The rail carrying structure that needs to be built will have to be in advance of the grading activity.

The GO Stations will also need to be initiated as they are complex to develop with buildings, pedestrian tunnels, station platforms with enclosures and canopies on them. Parking facilities and other road works at each station can be coordinated with municipal needs and completed as the stations are completed. Similarly the Layover Facility at Rundle Road will have to be graded and track built to hold the initial five (5) trains along with the fuelling depot and temporary office set up.

Once the roadbed and bridges are complete and the station elements around the roadbed are finished, the track construction can commence and the railway Central Traffic Control System (CTC) can be installed. Once these elements are completed, the new second track can be put into service and the CTC put into operation before the start of the new extended commuter train service.

E.4.4 Potential Impacts, Mitigation and Monitoring

The proposed expansion of GO services from Oshawa to Bowmanville will result in some natural, socio-economic, cultural, and technical impacts during construction and following construction. **Table E4-3** summarizes the potential environmental issues/concerns associated with this project, identifies the impacts during construction, and recommends

mitigation measures and prescribed future work/monitoring once the project has been implemented. It is noted that GO Transit will obtain all approvals, where applicable:

Table E4-3 Summary of GO Transit Service Expansion Potential Impacts and Mitigation Measures

Factor	Environmental Impacts During Construction/During Operations	Mitigation Measures	Future Work/Monitoring
		Note: GO Transit will obtain all approvals, where applicable.	

Drainage and Stormwater Management	• Potential flooding of the CNR to CPR Highway 401 crossing from a regional storm event.
	• Alterations to existing drainage patterns during and post-construction. Erosion and sediment migration or accidental spills into adjacent watercourses (i.e., Pringle Creek and Corbett Creek).
	• Increase in impervious surfaces on receiving watercourses following implementation of the proposed plan.
		• No mitigation required to address potential flooding as new structures (culverts and bridges) are designed appropriately to handle storm volumes based on CLOCA requirements
		• Direct all runoff and overland flows away from working areas and areas of exposed soils.
		• Store and handle all oils, lubricants, and other chemicals in accordance with MOE policies and other applicable provincial/federal regulations.
		• Refuel and maintain construction vehicles only in areas designated by the Contract Administrator preferably on a paved, impermeable surface, and more than 30 m from Pringle Creek, the Whitby Harbour PSW Complex, and Corbett Creek.
		• A Spill Response Plan shall be in place detailing the procedures to be followed in the unlikely event a spill were to occur. The Plan shall be developed in accordance with applicable legislation, and shall require a Spill Containment Kit consisting of, at least, absorbent materials to initially contain a spill, as well as protective gear for the handling of hazardous materials. The potential spills and hazards from the proposed rail line expansion to the water crossings and underground water sources will be re-visited at detailed design, and appropriate mitigation measures will be recommended.
		• Mulching and terraseeding of exposed soil.
		• Placing silt control at catchbasins.
		• All culvert works should be isolated from the watercourse and conducted in the 'dry'.
		• Placing silt fencing adjacent to slopes without sod or seed/mulch.
		• Installing silt fencing, rock check dams, and/or other appropriate measures in ditches where required in accordance with the *Erosion and Sediment Control Guideline for Urban Construction* (2006) and/or as specified in Contract Drawings.
		• Regular maintenance (clean-out) of ditches to minimize sedimentation build-up.
			• A Stormwater Management Plan will be developed in accordance with CLOCA during the detail design phase. The Plan shall detail stormwater management during construction activities as well as during operations and shall incorporate the MOE's Stormwater Management Planning and Design Manual (2003).
			• Further discussions will be held with CLOCA during detail design to confirm approvals required for construction/operation adjacent to watercourse features.
			• Stormwater Management Works including oil and grit separators, ponds and combination Best Management Practices (BMPs) will be incorporated into the design where warranted to facilitate with water quality within the CLOCA watersheds.
			• Alternatives for managing stormwater at Corbett Creek, including investigating the feasibility of introducing new culverts under CN rail will continue to be explored with landowners, GO and CLOCA.
			• Stormwater management issues will be addressed within the LEED design work for major facilities. It is noted that stormwater plans for stations will follow a treatment train approach, incorporating source controls (i.e., green roof, cisterns, permeable pavement) and the aforementioned end of pipe controls to the extent feasible.
			• The stormwater management pond at the ERMF will be designed to achieve the following:
			  • Enhanced (Level 1) water quality control;
			  • Extended detention of the runoff from a 25 mm storm for at least 24 hours; and
			  • Control of post-development peak flow rates to pre-development levels for the two (2) year through 100 year storm events.
			• The MOE requests that detailed stormwater plans for each proposed GO facility (i.e., ERMF, GO Stations, GO Layover, as well as the Highway 401 crossing) be prepared during detail design in full size drawings showing all of the catchment areas converging into the Oil and Grit Separators and/or ponds and other areas to drain into any neighbouring property without treatment and quantity control after the development. The drawings shall show among other things the 100-year flood line, future building facilities, land use parameters and land ownership, any water wells, stormwater and other utility pipes, swales and Municipal drains on the roadways and the ultimate received including indication of its size, area and depth.
			• During detailed design, the Flood Plain Mapping and flood storage areas will be refined and presented on full size drawing plates. Plans for a one year monitoring water quality program (prior, during and post construction) will also be prepared at the detailed design stage, and monitoring locations will be indicated on the drawing plates.
			• During detail design, the size, location and discharge points for all stormwater management ponds and best management practices will be finalized and presented on full size drawing plates. Plans for a one year monitoring water quality program (prior, during and post construction) including the location, frequency and parameters will also be prepared at the detailed design stage, and monitoring locations will be indicated on the drawing plates.

Factor	Environmental Impacts During Construction/During Operations	Mitigation Measures	Future Work/Monitoring
		Note: GO Transit will obtain all approvals, where applicable.	
			• Separate stormwater management reports will be prepared for the stations and major crossings will be prepared at the detailed design stage. The reports will include inspection and monitoring requirements, will address potential interference with adjacent wells, and will include the floodlines for adjacent regulated watercourses.
Fisheries	• Alteration of fish habitat during construction. • Debris entry to the stream during construction and in particular fill placement. • Indirect construction-related impacts (e.g., erosion and sediment migration to the streams, construction debris).	• To ensure the protection of Pringle Creek and Corbett Creek, heavy-duty sediment fencing will be installed to prohibit sediment from entering the creek. Hay bale check dams should also be installed in areas where there is water conveyance from the surrounding fields. • Due to the presence of coldwater species in Pringle Creek and Corbett Creek, in-water works construction should avoid the period from September 15th to July 1st. Consultation with CLOCA and MNR is required. • A 30 m vegetated buffer is recommended from top of bank to ensure the protection of Pringle Creek and Corbett Creek.	• Fluvial geomorphology studies should be conducted during detail design to assist with crossing structure design and channel restoration efforts (e.g., mitigate bank slumping) at Corbett Creek. • CLOCA has a Level III agreement with Fisheries and Oceans Canada (DFO). CLOCA will review the project in conjunction with the Level iii Agreements as per Section 35(1) of the *Fisheries Act*. CLOCA will confirm the appropriate timing windows during detail design and will assess all components of the project to determine whether there is a potential for the project to result in a Harmful Alteration, Disruption or Destruction of fish habitat (HADD) Metrolinx will work with CLOCA to ensure all appropriate mitigative measures are in place. • For areas where the rail tracks potentially cross Pringle Creek or Corbett Creek, culvert options should be ones with an open bottom. There may be restrictions set out by MNR/CLOCA regarding an acceptable culvert length. This should be further discussed with MNR/CLOCA.
Vegetation and Wildlife	• Decreased access/availability of forage due to vegetation clearing and compaction. • Clearing and damage of vegetation beyond the study area.	• Vegetation clearing zones and vegetation retention zones should be distinctly marked in both the Contract documents and the physical site itself to minimize the risk of unnecessary or inadvertent vegetation impacts and avoid incidental impacts as a result of temporary stockpiling, debris disposal and access. Works zones will be delineated in the field using construction fencing to minimize the area of disturbance and prevent disturbance of adjacent areas. • Appropriate vegetation clearing techniques (e.g., trees to be felled away from the retained natural areas) will be used to remove vegetation required for the proposed works). • All exposed surfaces will be re-stabilized and re-vegetated as soon as possible following construction, using an appropriate native seed mix.	• A re-vegetation plan will be developed for areas disturbed by the proposed works. • GO Transit or a pointed agent will be responsible for ensuring that all environmental mitigation and design measures are properly installed/constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required. • Metrolinx will obtain applicable approvals relating to tree removals including trees in designated hazard lands and park trees, as required.
	• Flight response/disturbance to avifauna. • Modification or loss of wildlife habitat. • Wildlife susceptibility or mortality due to construction activities. • Impacts on wildlife movement.	• The Contractor shall not destroy the active nests (nests with eggs or young birds), or wound or kill birds, of species protected under the Migratory Birds Convention Act and/or Regulations under that Act. All works will be complete in compliance with the Migratory Birds Convention Act. • Where feasible, timing constraints will be applied to schedule vegetation clearing and structure works (where birds may nest on a structure) outside of the breeding bird season (May 1st to July 31st). • If structure works cannot be scheduled outside the identified nesting season, ensure that bird nesting preventative measures (such as wire screens or tarps) are implemented to prevent new nesting prior to May 1st and are maintained until July 31st of the calendar year in which they were installed. At a minimum, the preventative measures will be installed at structures where evidence of past nesting was observed. These measures will be periodically checked, and maintained as required, so as not to entrap birds, and removed following construction when no longer needed.	• If vegetation clearing cannot be scheduled outside the breeding bird season timing noted above, then GO Transit or a pointed agent will be employed to conduct a nest survey in the area to be cleared. The pointed agent identified by GO shall have completed a university or college education in a pertinent environmental discipline and shall have experience and/or training in the identification of birds and their nests and eggs as well as the assessment and development of appropriate mitigation measures to address the presence of migratory birds during construction. If active nests of migratory birds are located, then clearing must discontinue until after the breeding bird season (i.e., clearing is allowed August 1st to April 30th). This may involve delays to allow for fledging. • Bird friendly lighting and design will be incorporated where warranted to reduce the potential for birds to impact proposed facilities. • GO Transit or a pointed agent will be responsible for ensuring that all environmental mitigation and

Factor	Environmental Impacts During Construction/During Operations	Mitigation Measures	Future Work/Monitoring
		Note: GO Transit will obtain all approvals, where applicable.	
		• Remove “inactive” nests (previous season, adult birds are not seen flying in and out of) prior to construction, or prior to undertaking the preventative measures outlined above. • The bridge structure design will maintain existing wildlife movement opportunities. • Any wildlife incidentally encountered during construction will be protected and will not be knowingly harmed. As required, GO Transit or a pointed agent will capture and release any small wildlife (e.g., turtles, amphibians) stranded within the construction zone.	design measures are properly installed/constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required.
	• Release fuels and other contaminants into natural areas. • Alterations in drainage patterns (e.g., surface runoff or groundwater flow).	• Temporary vegetation protection fencing should be installed to protect valley and riparian vegetation adjacent to work areas. The fencing should be secure and could necessitate the attachment of silt fencing for erosion control, depending on the circumstances within the site. • Erosion and sediment control measures will be designed, implemented and maintained throughout construction. This includes installing sediment and erosion control fencing along the edge of the required working area to protect the edges of all retained natural areas, as well as proper containment and filtering of all construction generated sediment (whether from dewatering or soil exposure from clearing and grubbing). • All construction-related debris will be appropriately contained during construction and cleaned-up and properly disposed of following construction. • All activity will be controlled so as to prevent entry of any petroleum products, debris or other potential contaminants/deleterious substances, in addition to sediment as outlined above, to natural areas. • No petroleum product storage, maintenance or refuelling of equipment will be conducted within these valleys. A Spills Prevention and Response Plan will be developed by the Contractor and spills cleanup materials will be kept on site at all times.	• GO Transit or a pointed agent will be responsible for ensuring that all environmental mitigation and design measures are properly installed/constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required.
Designated Natural Heritage Features	• There are no ESAs/ANSIs that would be impacted by the proposed facilities. • Soil disturbance/sedimentation to designated wetland features. • Impacts to unevaluated wetlands as well as the Whitby Harbour PSW Complex.	• See mitigative measures above relating to Vegetation and Wildlife Habitat and Drainage and Stormwater Management.	• Should the design require the removal of isolated wetlands, compensation measures in the form of wetland enhancement/restoration along the Whitby Harbour PSW Complex would be necessary. This should be discussed with CLOCA to establish the most appropriate compensation measure. • It will be demonstrated that there will be no negative impacts to the Whitby Harbour Wetland Complex during construction and operation activities. • GO Transit or a pointed agent will be responsible for ensuring that all environmental mitigation and design measures are properly installed/constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required. • CLOCA approval considering that work will be affecting small unevaluated wetland communities and potentially Corbett Creek Coastal Marsh. • The unevaluated wetland communities should be evaluated according to the Ontario Wetland Evaluation System for Southern Ontario (3rd edition).
Air Quality	• Increased dust during construction activities • Increase in emission factors CO, NOx, SO2, PM and VOCs following implementation of the	• Dust control measures and prevention of soils tracking by vehicles and personnel form construction site, including wetting of soil with potable water, reduced speeds for on-site vehicles, tire washing stations and restricting working areas in high wind conditions will be reviewed for	• The Contract Administrator will ensure that dust control measures in contract are adhered to during construction.

Factor	Environmental Impacts During Construction/During Operations	Mitigation Measures	Future Work/Monitoring
		Note: GO Transit will obtain all approvals, where applicable.	
	proposed GO facilities.	inclusion in the contract package during detail design. • The local effects of the future build are limited to receptors closest to the proposed stations. The modelled impact and concentration levels greatly decrease with increasing distance from the stations. Although there is an increase in local impacts, contaminant levels on a regional level will decrease due to commuters using the transit expansion. Furthermore the Future Build 2015 scenario will result in a decrease in the local concentrations of many contaminants such as NOx and Benzene.	
Human Health Risk Assessment	• See Air Quality above. • Increased diesel emissions arising from the planned expansion.	• See Air Quality above. • The most effective approach to improve local air quality throughout the GO Transit rail system would be the transition to Tier 4-compliant diesel vehicles by GO Transit as well as the continuation of provincial and federal initiatives that reduce ambient background concentrations of contaminants of concern in the GTA regional airshed overall.	• See Air Quality above.
Contaminated Properties	• Potential for encountering contaminated soils along existing CPR rail line.	• Construction Contract will include specifications to deal with contaminated soils in manner that satisfies MOE and GO/Metrolinx requirements. • A Soils Management Plan will be developed as part of detail design (i.e., site assessment or construction work). It will include provisions to characterize soils, determine suitability for proposed site use and address handling and disposal requirements for excess soils during construction.	• Contractor will be required to handle all contaminated soils in accordance with MOE standards.
Noise and Vibration	• Increased noise levels during construction operations that could potentially disrupt adjacent residential communities. • Increased noise levels following implementation of the proposed GO facilities beyond acceptable limits at the ERMF and the Rundle Road Layover Facility. • Wheel squeal noise could be significant at/near the curved sections of the new GO Transit rail tracks.	• It is recommended that the Contractor disseminate information to the general public regarding the planned construction activities, construction duration and project outcome within the Project Limits. Procedures should also be developed and implemented to receive and address noise and/or vibration complaints. • The Contractor is to adhere to the MOE's guidelines associated with construction equipment noise levels, which are outlined in NPC-115 Construction Equipment. Contractors should also adhere to the Ministry's noise guidelines NPC-118 and NPC-207, as well as any local municipal noise by-laws as established by the Town of Whitby, the City of Oshawa, or the Municipality of Clarington. • The installation of 5 m high noise barrier walls at the ERMF and the Rundle Road Layover Facility shall be considered based on administrative, operational, economic and technical feasibility. • Additional noise control measures (that may include physical and or administrative measures such as higher sound barriers) will be considered to reduce noise levels generated from the ERMF as well as the layover facility. • It is recommended that HVAC equipment be selected such that they are no larger in capacity than typical residential units (if feasible). The public address system should be limited during early morning or night-time hours, and the height and placement of the speakers will be confirmed during detail design and will include consideration of potential noise impacts, vulnerability to vandalism etc. Notwithstanding the above, the stations should be designed	• Noise and vibration monitoring will be ongoing and such complaints will be dealt with appropriately. • Vibration impacts from construction activities may vary greatly depending on the construction methods employed and the location of the construction activities. Projects involving typical low impact construction equipment may be addressed adequately by means of a qualitative construction vibration assessment. However, projects employing high impact equipment should be addressed by means of a detailed quantitative construction vibration assessment. • Where construction will include high impact vibration activities, a construction vibration assessment shall be prepared prior to the start of construction to avoid structural damage to buildings and underground infrastructure. • Details of noise barriers at ERMF and Rundle Road layover will be confirmed during Detail Design. • GO Transit will consider rail squeal noise generation during the detailed design of this project since mitigation measures do exist for the abatement of rail squeal noise generated at curves and if warranted they should be utilized for this project. If the project is constructed without the benefit of rail squeal noise abatement measures GO Transit will implement a complaints and/or noise monitoring procedure to track incidences of rail squeal and install retrofit abatement measures should they be indicated as warranted due to complaints and/or noise levels.

Factor	Environmental Impacts During Construction/During Operations	Mitigation Measures	Future Work/Monitoring
		Note: GO Transit will obtain all approvals, where applicable.	
		such that noise emitted from stationary sources complies with the requirements of MOE Publication NPC-205 or NPC-232, as applicable.	
Business and Economic Impacts	• Construction of the facilities may result in traffic delays and may disrupt businesses from conducting their daily routines. • Loss of agricultural lands that are currently being farmed as a result of the proposed GO facilities – although these lands are in areas designated for future development. • Nuisance impacts to the adjacent business during construction and operations.	• Traffic detouring will be implemented during construction where applicable to ensure local traffic (including local traffic from adjacent businesses) is redirected as best possible to reduce negative impacts to the overall community. • Existing farming land leasing agreement terms will be reviewed and construction will be timed to minimize leasing conflicts where possible. Should additional land conflicts exist as a result of breaching contracts, they will be dealt with during detail design through discussions with GO and property owners. • Additional mitigation related to noise and vibration construction impacts to adjacent businesses during and following construction are described above.	• A Communication Plan, which includes maintaining contact with regulatory agencies, utility companies, and members of the public on the master study mailing list to facilitate in minimizing additional business and economic impacts during construction, will be developed during detail design. • Any business complaints received during construction will be appropriately investigated and resolved in an effective manner.
Traffic Impacts	• Increased traffic on local roads as a result of construction activities and detouring. • Increased traffic during operations as a result of four (4) new GO Train Stations.	• Metrolinx will work with municipalities to develop feasible traffic detouring/staging during construction. • Based on the completed traffic studies, several recommendations have been put forward (e.g., signalizing intersections, additional turning lanes) to improve LOS characteristics to roads adjacent to proposed GO Stations. Such recommendations will be further developed during the detail design stage.	• The Contractor will be required to prepare and submit traffic staging and management plans in consultation with municipalities, emergency services, adjacent businesses, and school bus transportation services during detail design. • The Contractor is to maintain consultation with regulatory agencies throughout construction and ensure traffic staging is proceeding according to plan. Should the Contractor decide to deviate from this plan, the Contractor will be required to prepare and submit a revised plan in consultation with the regulatory agencies. • Metrolinx will continue to work with businesses on Hopkins Street during detail design to ensure that truck traffic delays are minimal during construction of the ERMF. It is noted that opportunities for alternate traffic routes that serve the area exist and Metrolinx is committed to facilitating such opportunities where feasible.
Property Impacts	• Loss of property through implementation of the proposed plan. • Construction impacts to adjacent properties not to be acquired.	• Compensation for required properties will be provided at fair market value. • Additional property impacts as a result of the construction activities relating to air quality, noise, and/or vibration have been addressed elsewhere in this section. • The Contractor will be required to minimize any temporary impacts caused by construction to adjacent properties.	• Property negotiations will be made during detail design for a total of approximately 23 location properties within the Project Limits. • A monitoring program will be implemented prior to construction and will include a pre-condition survey of existing conditions and areas that warrant special consideration.
Cultural Environment	• There are outstanding archaeological concerns for the proposed Rundle Road Layover Facility site access to the site could not be obtained during this study. • The proposed Thornton Road GO Station site contained one 19th to 20th century domestic site and was recommended for Stage 3 testing.	• Construction should not be allowed to proceed at the proposed Rundle Road Layover Facility site prior to the completion of the archaeological fieldwork and receipt of Ministry of Tourism and Culture letter of reporting acceptance. • Stage 3 testing was conducted at the proposed Thornton Road GO Station site in the fall of 2009. Since that time, the proposed layout for the Station site has been changed to avoid the site altogether, thus eliminating the need for additional mitigation measures.	• If construction plans change to incorporate new areas that were not subject to assessment, Stage 2 field survey must be carried out prior to construction. In keeping with legislative and policy stipulations, all construction-related impacts (e.g., machine travel, material storage, servicing and earth moving) must be restricted to areas that were archaeologically assessed and have been issued construction clearance by the Ministry of Tourism and Culture.
Rail, Road, Transit Networks	• During the structural work, there will be roadway delays/detouring measures implemented to ensure construction impacts	• Detailed traffic staging and management plans will be developed and provided to the Contractor in consultation in applicable regulatory agencies including municipal transportation departments and DRT during detail design.	• The Contractor will be required to prepare and submit traffic staging and management plans in consultation with municipalities, emergency services, adjacent businesses, and school bus transportation services during detail design.

Factor	Environmental Impacts During Construction/During Operations	Mitigation Measures	Future Work/Monitoring
		Note: GO Transit will obtain all approvals, where applicable.	
	are not negatively impacting motorists. • Durham Region Transit (DRT) potential delays around South Blair Street and Thornton Road from construction of grade separations.	• The Construction Contract will include requirements regarding access to CP lands during construction. These will include items that ensure safety and minimize potential for disruption to CPR freight service.	• The Contractor is to maintain consultation with regulatory agencies throughout construction and ensure traffic staging is proceeding according to plan. Should the Contractor decide to deviate from this plan, the Contractor will be required to prepare and submit a revised plan in consultation with the regulatory agencies. • The rail corridor will be structured to make sure that the freight activity operates along the north side of the rail infrastructure and is not designed to conflict with the commuter system during normal operations.
Utilities	• Disruption of utilities where they cross the rail corridor.	• Utility crossings of the rail corridor will need to be protected for at least the length of the load bearing area or overhead length. This will require a full discussion with the owners and checking that they meet the requirements under their crossing agreement with the railway. • For new sections of roadway this protection will need to be provided prior to building the new grade. • For all overhead utilities a verification with their correct clearance above the new track will be undertaken and those that need will have to be raised according with their crossing agreements with CPR. If there exist special situations GO Transit will work with the providing utility to develop a plan that will ensure that this crossing meets the protections required and at the cost of whom.	• Metrolinx/GO will work with affected utility companies to address all impacts in agreement with affected parties, including CPR.

E.5 Other Approvals Required

The following sections outline the conventional municipal, provincial, and federal approvals required for the implementation of this type of project. In some cases, approvals may be required for land development and in other cases for the proposed infrastructure improvements. The relevance of the approvals will be confirmed in future study phases, when design details are confirmed and further impact analysis work is completed. Additional approval requirements may be identified in the future. **Table E5-1** identifies approvals that may be required for the construction of a transit project.

It is noted that GO Transit will obtain all approvals, where applicable:

Table E5-1 Potentially Required Approvals

Municipal Approvals Required
• Planning approvals through the Town of Whitby, City of Oshawa and Municipality of Clarington; • Building approvals for station works and the East Rail Maintenance Facility (ERMF) from the Town of Whitby, City of Oshawa and Municipality of Clarington; • Central Lake Ontario Conservation Authority (CLOCA) approval for work within a regulated area; • Approval for stormwater management in accordance with the Town of Whitby, City of Oshawa and CLOCA requirements; • Sewer discharge approvals in accordance with the Town of Whitby, City of Oshawa and CLOCA requirements; • Municipal Noise By-law exemptions; • Official Plan Amendment, Town of Whitby and City of Oshawa; • Rezoning Amendment, Town of Whitby and City of Oshawa; • Urban Design Guidelines, Town of Whitby and City of Oshawa; • Site Plan Approval, Town of Whitby and City of Oshawa; • Tree-Cutting Approval, Town of Whitby and City of Oshawa; and • Alterations to Heritage Properties, Town of Whitby and City of Oshawa.
Provincial Approvals Required
• Permit to Take Water will be required from the MOE if dewatering or diversion of flow from any of the watercourses by means of active pumping in excess of 50,000 litres per day will result from construction activities; • Ministry of Tourism and Culture (formerly the Ministry of Culture) sign-off on proposed archaeological assessment documentation and agreement with findings of the additional documentation to be completed for heritage features; • In accordance with *Ontario Regulation 231/08* a notice to proceed must be obtained from the Minister of the Environment before the project can proceed to implementation;
Federal Approvals Required
• Fisheries Act Authorization from DFO; • Railway Safety Act from Transport Canada; and • Navigable Waters Protection Act approval from Transport Canada for water crossings at navigable waters.

E.6 Monitoring and Future Commitments

E.6.1 Impact Monitoring

Impact monitoring is a necessary continuation of the construction and operational application of the Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility. It is designed to evaluate the need to review or update the EPR, Detailed Design, etc., or to trigger the implementation of contingency plans that may include remedial measures needed to achieve the project goals and objectives.

A monitoring plan shall be prepared in accordance with Subsection 9(2)(8) of *Ontario Regulation 231/08*. The objectives of the monitoring plan are to: augment existing information and databases; determine the accuracy of impact predictions and effectiveness of environmental protection measures; ensure compliance with federal, provincial and local legislation and regulations; and ensure that EA commitments, plans and programs are carried out as planned.

In order to ensure EA commitments, plans and programs including prescribed mitigation are carried out as planned, project implementation monitoring will be documented on a seasonal basis for one (1) year after initial service commencement to document the degree of implementation of prescribed measures.

E.6.2 Operational Compliance/Impact Monitoring

GO Transit has standard procedures for spills management, accidents or malfunctions and track inspection. These procedures will be followed during the operations phase. For monitoring of the natural and social environment the following steps should be incorporated:

- Monitoring must be aimed at fulfilling one or more objectives, be subject to analysis and lead to potential actions;
- Monitoring should be for identifying problems, establishing a background reference, and evaluating the effectiveness of controls;
- Technology performance monitoring should be to confirm that the facility operates as designed, if not, determine if remedial design improvements are needed, or if it needs maintenance. This will assist in improving future designs;
- A monitoring program should be directed at connecting impact analysis with technology performance assessment;
- The strategy should recognize and incorporate existing monitoring programs; and
- Reporting on results and appropriate follow-up action is a key component that fulfils due diligence expectations.

E.6.3 Future Commitments

Commitments to future work identified in this report will be completed prior to construction and consultation with stakeholders will occur as appropriate. Additional communications with government and non-government stakeholders will be required during detail design and construction. Meetings and discussions will be held during detail design with government agencies (e.g., CLOCA, MOE, MNR) to obtain required approvals. All municipalities will be contacted to finalize details concerning proposed alterations to municipal roads and road structures as well as municipal utilities. They will be kept apprised of proposed project staging and mitigation details as they are further developed during the design process. They will also be kept informed of progress as construction procedures.

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1. Introduction

1.1 Background

1.1.1 The Big Move

Created by the Government of Ontario in 2006, Metrolinx addresses the urgent need to improve and integrate transportation within the Greater Toronto and Hamilton Area (GTHA), including the Cities of Toronto and Hamilton, and the Regional Municipalities of York, Peel, Halton, and Durham. Under the Greater Toronto Transportation Authority Act (2006), Metrolinx was established to create a long-term strategic plan for an integrated, multi-modal, regional transportation system, which among others, promotes the integration of local transit systems with each other as well as with the GO Transit system. To this end, on November 28, 2008, the Metrolinx Board of Directors adopted the first Regional Transportation Plan (RTP) called **The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area (GTHA)**.

Through identifying the existing environmental, technical and socio-economic challenges within the GTHA coupled with the global challenges of urbanization, increased energy costs, climate change, shifting economies, an aging population and public health, the RTP identifies a set of goals and objectives to be implemented in the next 25 years. To achieve the overall vision, the RTP contains a series of strategies that includes priority actions and supporting policies (Big Move document). Although these actions and policies will contribute to the transformation of the GTHA transportation system, nine (9) of these priority actions are highlighted as Big Moves. These Big Moves are those that will have the largest and most transformational impacts on the future transportation system within the GTHA.

In the first 15 years of the RTP's implementation, significant improvements will be made to the GTHA's transportation system. To facilitate with such improvements, a priority list has been developed on key regional projects that will result in substantial capacity increases, bring new rapid transit services to underserved areas throughout the region, and improve regional connectivity. As illustrated in Schedule 1 of the RTP, the improvements to existing GO Rail services and extension of GO Rail service to Bowmanville within the Municipality of Clarington is noted as a top transit priority. Through the extension of rapid transit, the communities located at the periphery of the GTHA will be given a viable alternative to driving and opportunities to shorten auto trips and facilitate in the reduction of congested roadways.

1.1.2 MoveOntario 2020

In June 2007, the Ontario government announced MoveOntario 2020, a multi-year $17.5 billion rapid transit action plan for the Greater Toronto Area (GTA) and Hamilton that will build 902 km of new or improved rapid transit. Through the MoveOntario 2020 initiative, the Government announced a list of 52 rapid transit improvements and expansion projects, including the GO Lakeshore East rail line extension from Oshawa to Bowmanville. The plan calls for 66% of the projects to be completed by 2015, and 95% to be completed by 2020. In this capacity, Metrolinx will hold the responsibility for evaluating, prioritizing and recommending an implementation action plan and alterations to the MoveOntario 2020 project list, which will come from the RTP.

1.1.3 Municipal Transportation Policies

The Regional Municipality of Durham (Durham Region) has been involved in several transportation planning initiatives to monitor travel characteristics within and beyond the Region and implement efficient methods of travel to minimize gridlock. Some of these initiatives include Smart Commute Durham, Transportation Tomorrow Survey, Cordon Count Program, and Travel Time Study. In addition, the Region and some of its member municipalities have adopted Transportation Master Plan (TMP) studies and Transit Strategies within their jurisdictions to define the policies, programs and infrastructure improvements over a long-term planning horizon. Details regarding these studies are outlined below.

Durham Region Transit Long-Term Transit Strategy (March 2010)

The Long-Term Transit Strategy (LTTS) is a comprehensive plan that identifies transportation/transit challenges and opportunities within Durham Region. Completed in March 2010, the LTTS considers multi-modal transportation alternatives as they relate to, and impact transit with an overall vision statement to create an adaptive, safe, reliable, accessible, desirable transit system that shapes and connects Durham Region and beyond in an economically environmentally sustainable manner.

Through a detailed analysis of the alternative solutions, the report recommends that to best address the current problems with Durham transit service, the Region should protect for Long-Term Regional Rapid Transit Network for 2031 and beyond. It was concluded that this approach provides the best long-term, environmentally sustainable solution to help manage the Region's future growth and transportation needs as this recommendation consists of conventional bus service, enhanced bus service, bus rapid transit (BRT), and light rail transit (LRT) throughout the upper tier municipal limits. Review of Exhibit A – Recommended Regional Road Transit Network Beyond 2031 within the report illustrates a 'GO Line' extension from the Canadian National Railway (CNR) to the Canadian Pacific Railway (CPR) Line with five (5) stations throughout the Town of Whitby, City of Oshawa, and Bowmanville. The illustrated Downtown Oshawa GO Station is also labelled as a 'Metrolinx Gateway Hub'.

Durham Region Transportation Master Plan (November 2005)

The Durham Region Transportation Master Plan (TMP) is a strategic planning document that was established to develop the transportation needs for the next 20 years and beyond. The TMP reflects the growth and development policies outlined in the 2008 Regional Official Plan and has been an important foundation of the updated consolidated Official Plan. Recent forecasts for the Region's population and employment is expected to increase by 55% (from about 550,000 to 850,000 persons) and 83% (from 170,000 to 311,000 jobs) respectively, by the year 2021. With this anticipated growth, the Region will face several challenges in providing a safe, efficient, and reliable transportation system (Durham, 2005). Among the vision, goals and principles outlined in the TMP, it is noted that the community has embraced a shift towards greater use of transit, pedestrian and cycling facilities and that the changes in modal usage have been accomplished by policies that encourage higher order transit facilities linking centres within Durham and other urbanized areas in the GTA.

Section 3.2.4 – Transit and Other Public Transportation Services in the TMP discusses the importance of an effective public transportation system to the long-term economic, environmental and community stability of the Region. Review of Figure 11 – Transit Priority Network within the TMP illustrates the Project Limits for this assignment as a 'Commuter Rail' along the CNR Corridor as well as a 'Future Transportation Corridor', which includes the CNR to CPR Crossing and extends east beyond the Project Limits in the Municipality of Clarington. As the 'Commuter Rail' designation

includes existing services provided by GO Transit intended to carry passengers over longer distances, the 'Future Transportation Corridor' supports the expansion of GO services to Bowmanville.

Within the limits of the 'Future Transportation Corridor' are sporadic 'Transportation Centres'. These centres, as described in the TMP, facilitate transfers between different modes of travel between transit services and feature passenger amenity areas and facilities, sufficient parking, efficient transfer provisions, and real-time traveller information (Region of Durham, 2005). It is suggested that the scale and form of such nodes will evolve over time and will be designed to match demand. It is noted that all of the 'Transportation Centres' within Figure 11 of the TMP have been considered as part of this EA Study. Some of these centres are located within or adjacent to lands that are designated as high-density commercial, retail or mixed-use development.

Among others, a recommended action as depicted in the TMP requests GO Transit to expand commuter rail service through the City of Oshawa, to the vicinity of Harmony Road and Bloor Street along the CPR Belleville subdivision (Region of Durham, 2005). Other recommendations include introducing measures that make public transportation more attractive to longer-distance commuters, examine opportunities to improve inter-regional connections and their compatibility with the Transit Priority Network, and to conduct feasibility studies to examine the use of the CPR Belleville subdivision between the City of Toronto and the Municipality of Clarington (Bowmanville).

Town of Whitby Transportation Master Plan (June 2010)

The Town of Whitby Transportation Master Plan (TMP) was designed to integrate both Regional and Provincial transportation and environmental planning, policies and requirements into a transportation framework for the Town (Town of Whitby, 2010). The Plan has been developed to be effective, accessible, integrated, multi-modal, balanced, sensitive, optimized, affordable, sustainable, and coordinated in order to support long-term growth and provide for efficient movement of people and goods to areas within and beyond the municipal limits.

As noted within Section 4.2.3(e) Transit Network, the TMP discusses the GO Transit East Extension from Oshawa to Bowmanville. It is noted that service is planned to be expanded and enhanced, which will better enable the Region to achieve transit mode share objectives and reductions in auto usage. Exhibit 4.3 – Planned Transit Network Improvements within the Plan illustrates a Metrolinx/GO Transit 'Potential Commuter Rail' Line crossing Highway 401 within and beyond the Town's Municipal Limits with a 'GO Train Station' at Thornton Road.

Under Part III – Recommended Transportation Plan, the Whitby TMP discusses the importance of encouraging and facilitating public transit. It is noted that public transit within Whitby plays a vital role in reducing the auto share of travel and that transit will play a significant role in moving people during peak periods as the municipality continues to grow. To this end, transit must be accessible, convenient, reliable, and integrated. As a portion of the Project Limits is situated within the Town's Sub-Area 1 (Lakeshore Whitby) key area, it is recommended that intensification of this area should be supportive of transit with key linkages to the Whitby GO Station (Town of Whitby, 2010).

Municipality of Clarington Transportation Master Plan (Forthcoming)

The Municipality of Clarington is in the process of developing a Transportation and Infrastructure Master Plan as an additional outcome to the Official Plan Review that will include and a strategic assessment of transportation and infrastructure issues and requirements. A strategic assessment of Clarington's existing transportation network and infrastructure systems will assist in identifying current issues and establishing a baseline for comparison with future conditions (Municipality of Clarington Website, 2010). There is no TMP available at the time this study was undertaken.

1.2 Purpose of the Transit Project

GO Transit provides inter-regional and inter-municipal rail and bus transit service to passengers over long distances and is currently Ontario's only interregional public transit system that links Toronto with the surrounding regions of the GTHA. Further to the Provincial transportation initiatives listed in Section 1.1, the Government of Ontario has committed to providing a better transportation system within the GTHA. Effective and expanded public transit infrastructure will:

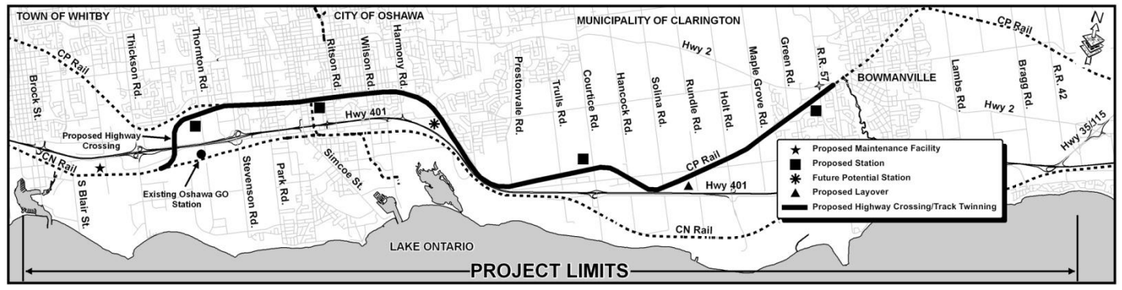
- Provide much needed new capacity in the transit systems in Ontario's urban centres;
- Manage traffic congestion, making it easier and faster to get people and goods where they need to go, and ensuring Ontario and Canada's economies remain competitive;
- Reduce Ontario's greenhouse gas emissions, cut smog and provide cleaner air to breathe; and
- Support sustainable urban development that leads to stronger, healthier communities and a higher quality of life (Transit Priority Statement, 2009).

As such, the purpose of this transit project is to provide the required infrastructure improvements to address the aforementioned transit benefits as well as to address the existing and future projected ridership demand requirements to/from Durham Region. Further to a recently completed Feasibility Study by Metrolinx for the Oshawa East track extension and new rail maintenance facility (April, 2009), the need was confirmed to expand rail services by twinning the existing CPR rail line and to identify possible locations to build new GO stations, layover sites as well as a rail maintenance facility yard (AECOM, 2009).

1.2.1 The Project

As noted in **Figure 1-1**, Metrolinx is proposing to expand GO rail services from 500 m west of Brock Street in the Town of Whitby to 500 m east of Regional Road 42/Darlington-Clarke Townline Road in the Municipality of Clarington. As such, the approximately 25 km long Project Limits will occur in the Regional Municipality of Durham (upper-tier municipality) and the Town of Whitby, the City of Oshawa and the Municipality of Clarington (lower-tier municipalities).

Figure 1-1 Project Limits



The site map above also illustrates the locations of each of the proposed GO facilities. As illustrated therein, a maintenance facility yard is being proposed within the Town of Whitby, immediately south of Victoria Street, east of South Blair Street, west of Hopkins Street, and north of the CNR line. Future GO services will be realigned from the CNR line to the CPR line via a Highway 401 bridge crossing. A GO station is being proposed south of the existing CPR main line, west of Thornton Road in the City of Oshawa and will be serviced by the proposed highway crossing.

Three (3) additional GO stations are being proposed through the remainder of the Project Limits with a fourth site identified for a future potential station. One (1) of which is located in Central Oshawa, bounded by south of Olive Avenue, east of Albert Street, west of Ritson Road, and north of First Street. The remaining proposed stations are located in the Municipality of Clarington. One station is being proposed south of Bloor Street, east of Trulls Road, west of Courtice Road, and north of the CPR line. An additional station, located in Bowmanville is being proposed south of Highway 2, west of Martin Road, and will be located on both sides of the CPR line. The fourth site, identified for a future potential station, is located east of Bloor Street and south of Grandview Drive South. Moreover, a layover facility is also being proposed within the Municipality of Clarington, south of Baseline Road, east of Solina Road, west of Rundle Road, and south of the CPR line. It is noted that that first phase of expansion will provide all day service to Central Oshawa, with a.m. and p.m. peak service to Bowmanville with the ultimate plan to have all day service to Bowmanville when demand warrants. A more detailed description of each proposed GO facility is outlined in **Section 4.2** of this report.

As part of the Transit Project Assessment Process (TPAP), a number of secondary source information was reviewed in relation to this transit project (see **Chapter 3**). In addition, several individual factor specific environmental reports were carried out as part of this study to confirm/augment the secondary source information received and to acquire a better understanding of the environmental implications anticipated from the project. A list of individual factor specific environmental reports carried out as part of this study are listed below with specific results of the investigations sub-categorized in **Chapter 3**.

- A Natural Environmental Conditions Report
- A Corbett Creek Watershed Flood Study
- A Stormwater Management Report
- An Air Quality Assessment Report
- An Environmental Noise and Vibration Assessment
- A Stage 1 to Stage 3 Archaeological Assessment

1.3 Environmental Assessment Process

1.3.1 Ontario Regulation 231/08

In order to accelerate the delivery of critical transit expansion projects, the Province of Ontario has passed a new regulation for transit projects to ensure a streamlined decision-making process to allow for such projects to move forward quickly. As such, this study is being carried out under the TPAP as prescribed in *Ontario Regulation 231/08*, Transit Projects and Greater Toronto Transportation Authority Undertakings (June, 2008). The regulation defines a transit project as,

“an enterprise or activity that is the planning, designing, establishing, constructing, operating, changing or retiring of (i) facility or service that … is used exclusively for the transportation of passengers by bus or rail, or (ii) anything that is ancillary to a facility or service … and that is used to support or facilitate the transportation of passengers by bus or rail…”

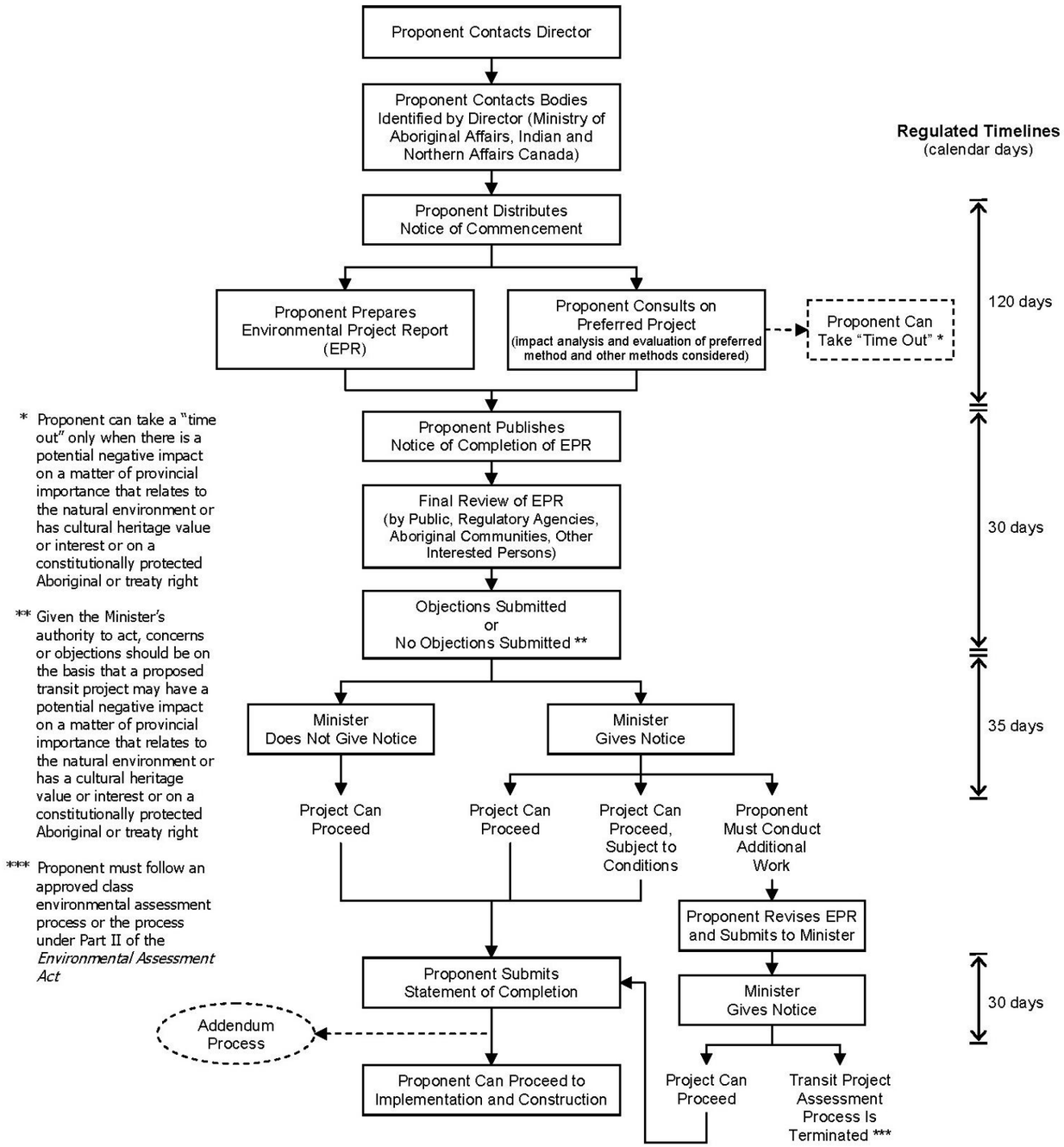
This TPAP is a proponent-driven, self-assessment process and does not require that a particular project be approved by the Minister of the Environment before proceeding. The process commences with a specific transit project and the regulation does not require proponents to look at the rationale and planning alternatives or alternative solutions to public transit or the rationale and planning alternatives or alternative solutions to the particular transit project (MOE, 2009).

The process allows for an assessment of potential environmental impacts to be completed within six (6) months. A detailed outline of the TPAP is illustrated in **Figure 1- 2**. Although these projects are primarily proponent driven, the regulation provides a framework for focused consultation and objection processes. It is noted that the Minister of the Environment may take action on any transit project if there is a potential for negative impacts 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 (MOE, 2009).

1.3.2 Federal Environmental Assessment Process

In addition to complying with *Ontario Regulation 231/08*, this project may also comply with the requirements of the *Canadian Environmental Assessment Act* (CEAA). A federal EA is triggered under Section 5 of the CEAA if a federal authority proposes a project, grants money to a project, grants interest in land for a project, or exercises its regulatory duty in relation to a project.

Figure 1-2 Outline of Transit Project Assessment Process (TPAP)



* Proponent can take a "time out" only when there is a 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 or the process under Part II of the *Environmental Assessment Act*

Source: Ministry of Environment. 2009. Ontario's Transit Project Assessment

2. Consultation Record

Consultation is mandatory for all projects that are subject to *Ontario Regulation 231/08*, as this process requires meaningful consultation with persons that are considered to have an interest in the transit project. Ongoing consultation throughout the transit project allows the project team to:

- Properly identify, inform or notify persons, that include those potentially affected by the transit project;
- Identify and assess the range of potential environmental impacts of the transit project; and
- Respond to the concerns of interested persons, including adjacent property owners and others who may be affected by some aspect of the project (MOE, 2009).

This chapter summarizes the regulatory agency as well as public comments received throughout the study process and is categorized through correspondence received Pre-Notice of Commencement (i.e., following the April, 2009 project initiation) and Post Notice of Commencement (i.e., during the formal Transit Project Assessment Process (TPAP) process). It is noted that all regulatory agency and public input received during this study has been considered as part of this Environmental Assessment (EA) process.

2.1 Pre-Notice of Commencement

2.1.1 Regulatory Agencies

During the pre-planning stages of the EA, an extensive list of regulatory agencies was generated to facilitate with project input and notification, as listed in **Table 2.1**. In addition, members of the project team scheduled pre-notice of commencement meetings with relevant government agencies/municipalities with jurisdiction or an interest related to this transit project.

Table 2.1.Regulatory Agency Contact List

Provincial Agencies	
• Committee on the Status of Species at Risk in Ontario • Energy and Infrastructure Ontario • Ministry of Aboriginal Affairs • Ministry of Agriculture, Food and Rural Affairs • Ministry of Tourism and Culture (formerly the Ministry of Culture) • Ministry of Environment • Ministry of Municipal Affairs and Housing	• Ministry of Natural Resources • Ministry of Tourism • Ministry of Transportation • Ontario Federation of Agriculture • Ontario Heritage Trust • Ontario Provincial Police • Ontario Realty Corporation

Federal Agencies	
• Agriculture and Agri-Food Canada • Canada Post • Canadian Environmental Assessment Agency • Canadian National Railway • Canadian Pacific Railway • Canadian Transportation Agency • Committee on the Status of Endangered Wildlife in Canada	• Environment Canada • Fisheries and Oceans Canada • Health Canada • Heritage Canada Foundation • Indian and Northern Affairs Canada • Parks Canada • Transport Canada • VIA Rail Canada
Municipal Agencies	
• Central Lake Ontario Conservation Authority (CLOCA) • City of Oshawa (Council, Clerk, Fire, Development Services, Planning) • Municipality of Clarington (Council, Clerk, Operations, Fire, Economic Development, Planning, Engineering)	• Regional Municipality of Durham (Council, Clerk, Emergency Services, Transit, Police, Works and Planning, Water & Sanitary Sewer) • Town of Whitby (Council, Clerk, Fire, Planning, Engineering)
Aboriginal Communities	
• Alderville First Nation • Chippewas of Beausoleil Island First Nation • Chippewas of Georgina Island First Nation • Chippewas of Rama Indian Band • Chippewas of Mnjikaning First Nation • Curve Lake First Nation	• Hiawatha First Nation • Huron-Wendat First Nation • Kawartha Nishnawbe First Nation • Mississaugas of Scugog Island First Nation • Moose Deer Point First Nation
Key Stakeholders	
• Architectural Conservancy of Ontario – Clarington • Bell Canada • Clarington Heritage Committee • Durham Catholic District School Board • Durham College • Durham District School Board • Enbridge Gas Distributions • Heritage Oshawa • Heritage Whitby	• Hydro One Inc. • Member of Provincial Parliament • Oshawa Historical Society • Oshawa Municipal Airport • Port of Oshawa • Rogers Cable Durham Region • Service Oshawa • Trans Canada Pipeline Ltd. • Veridian – Clarington Hydro • Whitby Hydro Energy Services

As noted in **Table 2.2**, a number of regulatory agency meetings were held following the April 2009 project initiation. These meetings allowed the project team to introduce the transit project to government agencies and to seek additional input on transit related issues, including environmental awareness and planning issues. In addition, a Stakeholder Technical Advisory Committee was formed to discuss additional project related issues. Meeting notes were taken for each gathering, which are included in **Appendix A – Pre-Notice of Commencement**.

Table 2.2.Regulatory Agency Meetings Pre-Notice of Commencement

Date	Regulatory Agency	Purpose of Meeting	Minutes Prepared
June 3, 2009	MTO, Durham Region, Town of Whitby, City of Oshawa, Municipality of Clarington	Stakeholder Technical Advisory Committee Meeting # 1 – Project Start	X
June 4, 2009	City of Oshawa	Provide project update	
June 15, 2009	Ministry of Transportation	Rail corridor crossing over Highway 401	X
June 17, 2009	Durham Region, Durham Transit	Coordination between project and planning	X
July 17, 2009	CLOCA	Environmental constraints within the Project Limits	X
July 23, 2009	Canadian Pacific Railway (CPR)	Design of GO Track extension within Project Limits	X
July 28, 2009	MTO, Durham Region, City of Oshawa, CLOCA	Input from Technical Stakeholders on GO facilities in Oshawa	X
August 11, 2009	Town of Whitby	Development of the Rail Facility and Highway crossing	X
August 12, 2009	Municipality of Clarington	Station/Layover sites and rail corridor expansion	X
August 13, 2009	MTO, Durham Region	Highway 401 crossing, traffic impact to Ritson Rd./Bloor St. interchange, interface between rail corridor expansion and Highway 401 connections to Highway 401	X
September 11, 2009	City of Oshawa	Revised track alignment	X
October 2, 2009	Canadian Pacific Railway (CPR)	GO Track alignment over CPR corridor	X
October 5, 2009	Durham Region, City of Oshawa, Municipality of Clarington	Traffic studies at GO station sites	X

In addition to the above scheduled meetings, additional correspondence sent and received from regulatory agencies throughout the Pre-Notice of Commencement timeframe is documented in **Appendix A – Pre-Notice of Commencement**. Also included in this Appendix is a summary description of all concerns expressed by interested regulatory agencies prior to the Notice of Commencement, as well as a description of how each concern was addressed.

2.1.2 Aboriginal Communities

Early consultation with Aboriginal communities is a critical part of any transit related project. As per *Ontario Regulation 231/08*, consultation with Aboriginal communities is intended to facilitate the identification of a constitutionally protected Aboriginal or treaty right that may be impacted by a transit project, and is thus considered a matter of Provincial interest (MOE, 2009).

As prescribed in the regulation, a letter requesting a list of agencies that can assist in identifying Aboriginal communities was sent to the Ministry of the Environment (MOE), Environmental Assessment and Approvals Branch on October 2, 2009. In response, the MOE recommended the project team contact representatives from the following department listed below from the Ministry of Aboriginal Affairs (MAA) as well as from Indian and Northern Affairs Canada (INAC). As such, a letter requesting a list of Aboriginal communities was sent to these applicable agency representatives on November 27, 2009 (A copy of all correspondence sent is included in **Appendix A – Pre-Notice of Commencement)**:

- INAC, Environmental Unit, Environmental Assessment Coordination;
- INAC, Senior Policy Analyst, Office of the Federal Interlocutor for Métis and non-status Indians;
- INAC, Litigation Team Leader, Litigation Management and Resolution Branch;
- INAC, Policy Analysis, Treaties and Aboriginal Government;
- INAC, Senior Claims Analyst, Specific Claims Branch (Ontario Research Team);
- INAC, Environmental Unit, Lands and Trusts Services;
- MAA, Director, Aboriginal and Ministry Relationships Branch; and
- MAA, Senior Policy Advisor, Aboriginal and Ministry Relationships Branch.

Based on information received from INAC in conjunction with additional MOE recommendations, a letter was mailed to ten (10) Aboriginal communities on July 23, 2010, (see **Table 2.1** above) who may have a potential interest in the study. The intent of the letter was to notify the communities of the project, and to request in writing, the nature of their interest and/or activities within or near the Project Limits.

2.1.3 Public Open Houses

As part of the Pre-Notice of Commencement consultation program, Metrolinx convened three (3) public Open Houses within the Project Limits to inform the public as well as regulatory agencies about the transit project and to receive preliminary input and comments from interested and/or potentially affected parties. The public Open Houses were scheduled from June 16 to June 18, 2009, within the Town of Whitby, City of Oshawa, and Municipality of Clarington from 6:00 p.m. to 9:00 p.m. Specifically, the Open Houses were held:

Town of Whitby		**City of Oshawa**		**Municipality of Clarington**	
DATE:	Tuesday June 16, 2009	**DATE:**	Wednesday June 17, 2009	**DATE:**	Thursday June 18, 2009
TIME:	6:00 pm – 9:00 pm	**TIME:**	6:00 pm – 9:00 pm	**TIME:**	6:00 pm – 9:00 pm
LOCATION:	Durham College Whitby Campus Room 2-10 1610 Champlain Avenue Whitby, ON L1N 6A7	**LOCATION:**	Holiday Inn 1011 Bloor Street East Guild East Room Oshawa, ON L1H 3J9	**LOCATION:**	Garnet B. Rickard Recreation Complex Multi-Purpose Hall 2440 Highway 2 Bowmanville, ON L1C 1K5

The purpose of these public Open Houses was to introduce the project and the new transit study process to landowners, municipal and provincial representatives, and other interested and/or potentially affected stakeholders. Furthermore, the Open Houses provided the public and external agencies with an opportunity to:

- Understand the route selection and feasibility of the new transit project;
- Participate in the pre-planning and decision-making process;

- View the display materials presented, including the general arrangement and study challenges;
- Ask questions and comment on the study process;
- Present/discuss issues and concerns related to the proposed undertaking with representatives from GO Transit and the AECOM project team; and
- Submit written comments/concerns related to the proposed transit project.

As the project was still in the pre-planning stages of the formal announcement of the EA initiation, select methods were used to notify interested parties to the Open Houses and invite them to attend and participate. Direct notification letters were mailed out in advance of the Open Houses to applicable regulatory agencies, including municipalities on June 3, 2009 (see **Appendix A**). In addition, a Notice of Public Open House was published in the following local newspapers:

- Clarington This Week - published June 3 and June 5, 2009
- Oshawa/Whitby This Week – published June 3 and June 5, 2009

The Open Houses provided an informal drop-in centre setting whereby participants could attend between 6:00 p.m. to 9:00 p.m. to view the display boards containing information about the project, and speak one-on-one with GO Transit and/or AECOM project team representatives. An Open House handout (see **Appendix A**) of the display boards was available at the sign-in table for attendees. Specific display materials included:

- GO Transit Expansion Public Open Houses
- Welcome
- Proposed Scope of the Expansion
- Study Process
- New Transit Study Process
- Study Background
- Study Background (Con'd)
- CNR/CPR Rail Corridor Evaluation
- New Rail Maintenance Facility Site Evaluation Union Station to Clarington
- Study Challenges
- Overview of Proposed GO Facilities (Graphic)
- Potential Crossings of Highway 401 (Graphic)
- Potential Station at Stevenson Road (Oshawa) (Graphic)
- Potential Station at Ritson Road (Oshawa) (Graphic)
- Potential Station at Bloor Street (Oshawa) (Graphic)
- Potential Station at Courtice Road (Clarington) (Graphic)
- Potential Station at Martin Road (Clarington) (Graphic)
- Potential Station at Lambs Road (Clarington) (Graphic)
- Potential Layover at Prestonvale Road (Clarington) (Graphic)
- Potential Layover at Rundle Road (Clarington) (Graphic)
- Potential Layover at Providence Road (Clarington) (Graphic)
- Rail Maintenance Facility (Whitby) – Typical Layout (Graphic)
- What's Next?
- Your Input is Important

Participants were offered and encouraged to fill in and submit a Comment Sheet to gauge feedback on the project (see **Appendix A**). Written comments could be submitted during the Open House or emailed/faxed/mailed to members of the Project Team by **June 30, 2009**. It is estimated that approximately 100 participants attended the three (3) Open Houses; however 90 participants officially signed the attendance register. Such participants include regulatory agencies, Councillors, nearby residents, landowners as well as development companies. A summary of comments received at the Open Houses is listed below. Detailed comment sheets are included in **Appendix A**. Also included in this Appendix is a summary description of all concerns expressed by interested parties prior to the Notice of Commencement, as well as a description of how each concern was addressed.

Most participants were satisfied with the findings of the Feasibility Study as it was well thought out and covered many aspects of the project. However, some participants noted that this Study should have expanded on methodologies adopted by other Countries. A few participants expressed their concerns with the preferred methods of expanding GO services on the CPR line as opposed to the Canadian National Railway (CNR) line; however most participants were pleased with the expansion of GO services from Oshawa to Bowmanville and have argued that this is a long overdue initiative. Suggestions were made to electrify this line to facilitate with the overall reduction of emissions from the proposed undertaking and to adopt methods already implemented by other Countries. Moreover, some residents expressed noise, traffic, as well as future parking concerns with the proposed GO facilities. Other comments expressed during the Open Houses include:

Proposed GO Stations

- The proposed Stevenson Road GO Station appears to be an overall benefit to the community
- Consider wheelchair accessibility at each station location
- Make parking lots more aesthetically pleasing by considering a greater landscape component

Preferred Corridor

- The environmental impacts along the CNR/VIA corridor would be marginal in comparison to the impacts along the CPR alignment, including the CNR to CPR crossing
- Good to have passenger tunnels underneath as opposed to overhead bridges

Environmental Impacts

- Tile drainage 100 feet east of Trulls Road on the north side of tracks is an outlet from drainage and incorporates 50 acres of systematic tiling, which is very critical for draining lands to the north
- Oshawa's road network cannot handle the anticipated increase in traffic as a result of the additional GO Stations
- The proposed expansion will help reduce the ecological footprint, allow for an easier commute to and from Toronto and get more people on GO Trains

Connectivity

- GO Transit needs to improve connectivity along the Lakeshore Line to the City of Toronto

2.1.4 Additional Public Correspondence

Following the public Open Houses, a number of additional comments were received primarily through an exchange of emails. Additional members of the public requested to be added to the study mailing list, and provided insightful input on the proposed GO service expansion. Additional public correspondence received following the public Open Houses is documented in **Appendix A** of this report. Below is a summary of additional public correspondence received:

Proposed GO Stations

- One (1) person requested the project team consider a station near the west end Clarington Mall as many people would utilize the station/parking and would be provided with public transit immediately adjacent to the mall.
- One (1) person fully supported the proposed GO station at Ritson Road. It is noted that the Michael Starr Trail can act as a major uninterrupted route to downtown Oshawa, GO Transit and Highway 401. Moreover, much of the costly infrastructure is already in place and the existing widened roadways can easily accommodate large daily volumes of diesel, pedestrian, and commuter traffic. It is recommended that a road underpass at Michael Starr Trail would be a better option for connectivity reasons.
- Two (2) nearby residents noted that the Courtice Road GO Station should be considered. In addition, it was noted that the proposed Stevenson Road station not be considered to preserve greenspace and to preserve pedestrian movement. Moreover, the station at Bloor Street may not be required as it is relatively close to Courtice Road. Additional comments were provided regarding the potential Highway 401 crossings and the preservation of parks, encouraging higher GO trains and frequency.

Preferred Corridor

- One (1) resident currently residing in Bowmanville expressed their concerns with the preferred option to expand GO services along the CPR line. It was noted that there would be excessive noise and fumes concerns along with significant environmental impacts. It was recommended that the CNR line be the preferred location for GO service expansion.

Operations

- One (1) person questioned whether the CPR trains around the Martin Road area in Clarington will operate slower as a result of the GO tracks?
- One (1) person questioned whether the expansion will extend toward Newcastle or Port Hope at some point?

Other

- Five (5) people requested a copy of the Open House slides.

2.2 Formal Transit Project Assessment Process (TPAP) Notice of Commencement

2.2.1 Regulatory Agencies

The list of regulatory agencies generated during the pre-Notice of Commencement stage of the EA was also used to provide agencies with the Notice of Study Commencement and Public Information Centres (PICs) and to seek input on the project. Agencies added to the contact list since the pre-Notice of Commencement phase include the Ministry of Energy and Infrastructure, Industry Canada, municipal libraries, and the Durham Region Health Department.

Appendix B – Post-Notice of Study Commencement documents correspondence with regulatory agencies since the Notice of Study Commencement was issued, and includes a summary table of issues raised and a description of how each comment was addressed.

2.2.2 Aboriginal Communities

Consultation with Aboriginal communities that began during the pre-Notice of Commencement phase of the project has continued into the formal TPAP process. On September 24, 2010, a letter was sent to INAC and MAA agency representatives inquiring about claims within the Project Limits. Notification letters were also sent to several Aboriginal communities informing of the project and consultation opportunities. Correspondence with Aboriginal agencies and communities is included in **Appendix B**.

2.2.3 Public Information Centres

The Notice of Study Commencement included an invitation to participate in the formal consultation period of the study. The project team employed several methods to notify the public and agencies of the study and invite them to attend and participate in the PICs. The various methods used are as follows:

- Notice of Study Commencement and PICs sent by direct mail on Friday September 24, 2010 to regulatory agencies, the public mailing list (from the pre-Notice of Commencement phase), and property owners within 30 m of the CPR line and within 120 m of proposed station sites;
- Notice of Study Commencement and PICs sent by email on Thursday September 30, 2010 to regulatory agencies and members of the public who provided email addresses during the pre-Notice of Commencement phase;
- Notice of Study Commencement and PICs published in local newspapers (Clarington This Week, Oshawa This Week and Whitby This Week) on Thursday September 30 and Friday October 1, 2010;
- Study information and PIC invitation published on the GO Transit website on Friday October 1, 2010;
- Study information and PIC invitation distributed via the GO Transit E-News system to Lakeshore East customers on Friday October 1, Wednesday October 6 and Tuesday October 12, 2010 after the PM rush; and
- Study information and PIC invitation published on the Transit Toronto blog on Monday October 4, 2010.

GO Transit held three (3) PICs on October 7, 13 and 15, 2010 in the Municipality of Clarington, City of Oshawa and Town of Whitby, respectively, from 6:00 p.m. to 9:00 p.m. More specifically, the PICs were held:

Municipality of Clarington	**City of Oshawa**	**Town of Whitby**
DATE: Thursday October 7, 2010 **TIME:** 6:00 pm – 9:00 pm **LOCATION:** Baseline Community Centre 2444 Baseline Road Bowmanville, ON	**DATE:** Wednesday October 13, 2010 **TIME:** 6:00 pm – 9:00 pm **LOCATION:** Royal Canadian Legion 471 Simcoe Street South Oshawa, ON	**DATE:** Thursday October 14, 2010 **TIME:** 6:00 pm – 9:00 pm **LOCATION:** Durham College Whitby Campus (Cafeteria) 1610 Champlain Avenue Whitby, ON

The PICs provided an informal drop-in centre setting whereby participants could view display boards containing information about the project and speak one-on-one with GO Transit and/or AECOM Project Team representatives. The purpose of the PICs was to present the preferred future expansion plan, explain the study process and seek public input. The public and agencies had an opportunity to:

- Participate in the planning and decision-making process;
- View the display materials presented, including the study purpose and Transit Project Assessment Process;
- Examine the site design concepts for the potential stations and facilities;

- Identify and discuss issues or concerns related to the proposed undertaking with representatives from GO Transit and the AECOM Project Team; and
- Submit written comments/concerns related to the proposed project.

Items presented on display boards at the PICs are as follows:

- GO Transit Rail Service Expansion and Maintenance Facility Transit Project Assessment Process Public Information Centre Welcome
- Sign In and Comment Forms
- Study Purpose
- Study Area/Overview
- Proposed Expansion Scope
- Transit Project Assessment Process
- Public Open Houses
- Public Open House Feedback
- Existing GO Service & Stations
- Projected Ridership Demand
- Site Design Concepts – Potential Highway 401 Crossing (CN/CP) (Graphic)
- Site Design Concepts – Potential Station: Thornton's Corners GO Station (Graphic)
- Site Design Concepts – Potential Station: Oshawa GO Station (NEW) (Graphic)
- Site Design Concepts – Future Potential Station: Grandview GO Station (Graphic)
- Site Design Concepts – Potential Station: Darlington GO Station (Graphic)
- Site Design Concepts – Potential Station: Bowmanville GO Station (Graphic)
- Site Design Concepts – Potential Train Layover Facility: Rundle Road (Graphic)
- Site Design Concepts – Rail Maintenance Facility: Thickson Road (Graphic)
- Study Evaluation Criteria
- Next Steps
- Thank You for Attending

Participants were offered and encouraged to fill in and submit a Comment Sheet to gauge feedback on the project (see **Appendix B**). Written comments could be submitted during the PIC or emailed/faxed/mailed to members of the Project Team by **October 29, 2010**. It is estimated that approximately 300 participants attended the three (3) PICs; however, 278 officially signed the attendance register, including 103 in Bowmanville, 102 in Oshawa and 73 in Whitby. Attendees included nearby residents, landowners, developers, regulatory agencies, municipal staff, Councillors and one Mayor. A summary of comments received at the PICs is provided below. **Appendix B** includes a summary description of all concerns expressed by interested parties following the Notice of Study Commencement, as well as a description of how each concern was addressed.

Most respondents were supportive of the proposal to expand GO Transit rail service from Oshawa to Bowmanville. However, several respondents had specific concerns related to increased traffic and parking issues as a result of the proposed stations, especially at Thornton Road, Ritson Road and Martin Road GO Stations. Some participants noted concerns with the preferred rail corridor, which recommends using the CPR line as opposed to extending service on the CNR corridor. Other respondents identified issues about noise and vibration as well as safety concerns. Participants generally raised specific concerns related to these topics while demonstrating support of the proposed project as a whole. More specifically, comments expressed during the PICs include:

CPR vs. CNR Corridor for Expansion

- One (1) respondent indicated the whole line crossing over to the CP doesn't make sense. It will be more difficult to get to for most residents and more costly to implement. Why not use the existing infrastructure south of the 401? The roads and rail seem like they could handle the traffic without extreme costs.
- One (1) respondent indicated the route is wrong – should be continued along CN right of way. The CP was built over 100 years ago with too many curves (wanders all over) and is not cost or time efficient. Buses will always be needed to get many of the commuters to the stations and this also reduces the number of parking spaces needed. The bridge crossing the 401 will be very costly and will take time to build. Following the CN line makes more sense and will save both time and money.
- Two (2) respondents think it would make more sense to have the GO run on the CN line not through residential areas on the CP line.
- One (1) respondent thinks it's a good idea to build on the CP line, but is it going to be a problem with neighbourhoods? Which side of CP rail is the new line going to be built on?
- One (1) respondent suggested using CN (Windsor Corridor). Farewell Street – industrial and easy access to 401, minimal impact to existing neighbourhood. Courtice Road – south of 401, easy access, zero impact on existing development. Holt Road – zero impact, easy access.
- One (1) respondent indicated that people will go to the GO Train if it is still on the CN tracks, wherever.

Highway 401 CNR to CPR Crossing

- One (1) respondent is concerned about the CP Bridge at Oshawa Creek and flooding upstream caused by the restriction it creates.
- One (1) respondent indicated it appears that the GO Train expansion has not considered all the houses and roads it will affect. If the CP railway crossing at Thornton is not going to be changed and have the road go over, there will be line ups everywhere. We already have the CP line and the GM Spur line behind us. Why would we want another service going through every hour and listening to the horn as it approaches the station.

Thornton Road GO Station Site (Thornton's Corners)

- One (1) respondent indicated the Thornton Corners site is a natural as long as two things happen: 1) the existing service road parallel to the Highway 401 is widened; 2) a bridge is built over the level crossing that currently exists. We are often stuck waiting at the current crossing, either because of a small switch engine working near the crossing or because of a full freight train. The drawing shows a bridge over the proposed GO track, but doesn't appear to show a change in the existing level crossing. You could also lobby for creation of formal parking for the users of the playing fields at Thornton and Gibb. When there is a full lacrosse tournament, etc., cars are parked all along the street/road.
- One (1) respondent is concerned about road congestion – all roads are only 2 lanes, to get to the station on Thornton Road, as proposed.
- One (1) respondent is concerned about the cost of building another overpass when there was one recently built at Stevenson, the cost for road improvements and the cost to build another station within 1 km of an existing station. Thornton Corners not necessary.
- One (1) respondent is concerned with the volume of traffic to the area. We already have Trent University going in ½ km north of proposed new station. With proposed 1,900 cars from the new station, and traffic from new University, the area will be overrun with vehicles. Thornton is only 1 lane northbound/southbound. Suggest finding alternative routes, or move station to a less populated area.

- One (1) respondent indicated it appears that most traffic exiting Thornton Corners car park will take Thornton Road North. How will you handle congestion caused by CP crossing? Gibb Street is heavily travelled now. Making exit from Vancouver Crescent hazardous due to excessive speeds. If traffic increases more it may be almost impossible to exit west onto Gibb without additional traffic signals, which will cause more congestion. Send someone around to witness how it is right now.

Ritson Road GO Station Site (Oshawa GO Station NEW)

- Several respondents are concerned about construction in front of their homes on Fisher Street.
- One (1) respondent is concerned about parking on Fisher Street once the Ritson Road Station is operational.
- One (1) respondent is concerned about traffic on Front Street.
- One (1) respondent is concerned that First Avenue will need to be widened to accommodate increased traffic, as it is currently 1.5 lanes wide (each direction). There are only two houses on First Avenue and the respondent is concerned that they will have the road on their doorstep.
- One (1) respondent will be filing an injurious affection claim if Metrolinx goes ahead with the Knob Hill Station.

Courtice Road GO Station Site (Darlington GO Station)

- One (1) respondent is curious if the Courtice Station land has been purchased yet. Also wondering if there are road upgrades planned for Courtice Road because it is currently one lane each way.
- One (1) respondent suggests the east side of Courtice Road should be considered as a potential site so that in future residential development could occur all around the station. This could be preferable over the location on the west side of Courtice Road.

Martin Road GO Station Site (Bowmanville GO Station)

- One (1) respondent had safety concerns regarding Martin Road Bowmanville, right in – right out. No access on Martin Road North if you have to turn left to get in. Aspen Springs will be jammed if coffee shop is allowed to be on the corner.
- Several respondents are concerned that sufficient parking spaces be built for the Bowmanville Station to accommodate future growth, so that riders can park at any time of day.
- One (1) respondent indicated there will be tremendous traffic build-up for all residents living in the immediate area of the Bowmanville GO track, any residents in the Aspen Springs area are going to be constantly fighting traffic getting in and out of the area, we already face a lot of traffic trying to get out of Aspen Springs Drive onto Martin Road. To have an IN only driveway from Highway 2 into the GO Station, then OUT only going south is going to create a gridlock onto Aspen Springs.
- Several respondents are concerned about traffic lights to exit the Bowmanville Station and traffic around the station.
- One (1) respondent is concerned with parking pollution, and wondered if there is room on Aspen Springs Road for the traffic, and if RR 57 is going to be widened.
- One (1) respondent asked if there will be a pedestrian walkway built at Bowmanville Station to allow people to cross tracks without having to go through the actual station. There are currently a lot of high school students that use that particular route to get to CCSS. Right now they cross tracks illegally and are risking injury. Wondering what will happen during construction – if there will be a temporary walkway.

Albert Street Bridge

- Several respondents are concerned that Albert Street bridge cannot handle the additional traffic and needs to be replaced.
- Several respondents are concerned about noise with the old wooden bridge.

Parking and Traffic

- Several respondents mentioned how hard it is to get out of the Oshawa Station at rush hour. One (1) respondent states that multiple exits from each of the new stations must be a key consideration.
- One (1) respondent indicated there should be bridges/tunnels to allow flow of road traffic rather than using rail crossings/barriers.
- One (1) respondent is concerned with significantly increased traffic flow.

Noise and Vibration

- Several respondents are concerned about noise levels from the trains. Specifically mentioned were the possible ‘screeching’ generated by rail traffic negotiating the curved rails between the CNR tracks and Highway 401 and the curve south of the CPR tracks, noise around South Blair and the proposed highway crossing, noise levels from 16 trains daily, concerns about children sleeping with the noise, and construction-related noise, especially early in the morning.
- Some respondents are concerned about property values decreasing due to noise and are wondering who will provide compensation.
- Several respondents suggested building sound barriers; one (1) specifically mentioned a sound barrier for Aspen High Phase #2; another asked what sound barriers will be installed to protect from train traffic and Thornton’s Corners Station whistles, shuttling, etc.
- One (1) respondent does not want any green noise barriers as they would become a graffiti art board.
- One (1) respondent wondered how regulating will occur if speed regulations are put into place to lower noise pollution.
- One (1) respondent wondered when GO Transit will electrify the Lakeshore line to decrease noise pollution.
- Several respondents are concerned about vibrations from the trains. Some specifically mentioned the extra vibrations potentially causing structural damage to their houses.
- One (1) respondent is concerned with increased rail traffic, noise and pollution.

Safety

- One (1) respondent is concerned about his or her children’s safety.
- One (1) respondent is concerned about the quality of fence that will be used to prevent trespassers on the right of way at the end of Orchard Park and Oshawa Boulevards. Suggests 8 foot chain link with barbed wire on top to dissuade trespassers.
- One (1) respondent is concerned about the speed. How fast will the train travel?
- One (1) respondent is concerned about safety – derailment and additional traffic in school zones.
- One (1) respondent is concerned with overall safety. This individual lives along the proposed CP corridor near where the train derailment occurred last year.
- One (1) respondent is concerned about safety/security in the parking lots as cars are stolen and broken into. GO gives the impression that they don’t care, it’s not their problem, call your insurance company.

Other

- One (1) wants bikes to be allowed on trains during rush hour. Find way for dedicated storage with easy access, like on buses.
- One (1) respondent suggests an express bus from Whitby to Toronto.
- Several respondents are concerned about loss of privacy as the train runs against their backyards. The line behind will need structural build (at bridge at Harmony/Bloor, Oshawa). How long will there be building machinery there? What will protect their property and privacy during this time?
- One (1) respondent is concerned that the expansion is taking too long. A station was built north of Stouffville with passenger count that could not be as large as Bowmanville. Population north and east of Bowmanville are growing greatly. In June 2009, there was a question to when this was going to be started and completed. The answer was shovel in the ground summer 2010 and hope to be completed 2013. Now I hear money still not set aside for this project. Why?
- One (1) respondent is concerned that the station designs follow old outdated planning principles and do not complement the Growth Plan, i.e. more structural parking, mixed use development. Also concerned about pedestrian traffic and safety. More can be done on every parking lot to demarcate pedestrian routes and provide landscaping to make the developments “greener”.
- One (1) respondent indicated there appears to be a great deal more detailed plans of the Oshawa Station compared to the Clarington stations. It concerns him/her that expansion will stop in Oshawa just like the 407.
- One (1) respondent indicated the displays of each station layout and site were confusing since the site plans at each display did not indicate the relative locations of each station relative to the Highway 401, key land marks like Oshawa Centre, etc. There should have been more macro views of the site and more major roads shown.
- Several respondents are concerned that they are local residents, but were not notified of previous PICs.
- One (1) respondent is unhappy that she had not been notified before this meeting – she will be forwarding a letter to MPP, MTO and MOE.
- One (1) respondent is concerned about inappropriate comments by staff (i.e., staff said, “what do you expect with a mass transit system, we are going to take it to where the masses are”). The respondent felt that this made it appear the decisions were already final and the impact on people along the proposed path isn’t viewed as significant.
- One (1) respondent is concerned about dependable/reliable service – trains are always breaking down.
- One (1) respondent is concerned that an overpass was built at Ritson or Simcoe bridges need to be replaced.
- One (1) respondent is concerned that ridership will not be good as the GO will only accommodate those who work downtown Toronto.
- One (1) respondent is concerned about air quality in her backyard and house, as well as air quality with cars going into and out of the parking lot.
- One (1) respondent mentioned increased property taxation.
- One (1) respondent is concerned about the City of Oshawa’s plan of secrecy about this station.
- One (1) respondent is concerned that during dark hours, train headlights (eastbound) after crossing Highway 401 will be pointed directly towards homes backing onto Burns/Gibb.
- One (1) respondent hopes that one day the GO Train will continue much further east of Bowmanville.
- One (1) respondent said the project has been very well thought out, and very thorough.
- One (1) respondent wondered how this expansion will impact their property. Frequency and possible loss of part of our property.

Request for Additional Information

- Several respondents requested to be included on future updates about the project.
- It would be helpful to receive the economic impact stats for Clarington so we can add additional incentives to rally our community.
- It would be helpful to include information about how many trips are being considered from the new Oshawa station to Bowmanville etc. Staff advised 4 east and 4 west each day. Including this info in the written material would help put this part of the expansion in better perspective.
- Are the archaeological findings available?
- A list of local government contacts should be made available at these meetings. Several respondents were concerned that local government and media did not attend the meeting.
- Where is the money for this project coming from?
- What is the timeline for this to begin? GO Station at Knob Hill Farms? Would you be using PPG plant as well for additional parking?
- Who is paying for the upgrades/widening of regional and municipal roads that act as entries and exits of station parking lots, i.e. Thornton Road from Highway 401 to Gibb Street? Is this a direct download on municipal and regional taxpayers? If the province/developers can’t afford the extension of 403 to 115/35 how will this be paid for? More debt?
- One (1) respondent with the company that owns the land on Thornton Road requested to be contacted by the Project Team.

2.2.4 Additional Public Correspondence

Following the PICs, a number of additional comments were received primarily through email correspondence with the Project Team. Additional members of the public requested to be added to the study mailing list and provided input on the proposed GO service expansion. Public correspondence received (and responses provided) following the PICs is documented in **Appendix B** of this report. Below is a summary of additional public correspondence received:

CNR vs. CPR Corridor for Expansion

- One (1) respondent indicated that through the residential part of Oshawa, the CP tracks run along at least three (3) elementary schools and one (1) high school. It will affect residential traffic getting in and out of smaller communities that only have one way in and out. Establishing the tracks through Oshawa on the south CN tracks affects fewer residents and to my knowledge no schools, it is approximately 1.5 kilometres south of the CP tracks.
- One (1) respondent is concerned with the use of CP lines and was under the impression that the CN line was to be continued to be utilized especially when different changes were being made east of the Oshawa GO Station.
- One (1) respondent indicated that he is not in favour of the proposal to reroute to the CP rail instead of the CN rail route. This definitely would increase the noise, pollution and traffic congestion near my home. As a senior I enjoy living in the area and would not appreciate the congestion that this change would incur. There are new power malls in this area that are already causing heavy traffic flows. The possibility of crossing at the Thornton Road (CP) tracks are at street level would certainly pose a safety issue – if they change this the money spent to revamp this would be counterproductive. I have family members who work for CN and I know firsthand the danger of this type of crossing as they monitor/maintain the crossings.

Thornton Road (Thornton's Corners) and Ritson Road (Oshawa GO Station NEW) GO Station Sites

- One (1) respondent is concerned that the road developments in the Thornton Road and Knob Hill Farm Station areas have not been well maintained and this will be reflected back onto the public to absorb. Oshawa already has one of the highest tax rates.
- One (1) respondent is concerned why the station will be constructed in an old residential area of Oshawa. There are tight roads and streets, and with the incoming traffic will our homes be destroyed for roads and streets to become two-ways or four-lanes?
- One (1) respondent is concerned with increased road traffic on Gibb Street, which will inevitably become a major access route to the proposed Thornton's Corners Station
- One (1) respondent is concerned with parking and if commuters will park on streets and even on our properties.

Noise, Vibration and Property

- One (1) respondent is concerned for herself and seniors on her street regarding: noise and air pollution to homes, environment, children and natural habitats; reductions in the resale value of our homes; possible structural damage to homes and properties surrounding us; and the possibility of a cement wall to be erected to break the noise thereby opening this to graffiti and making our street look run down and also taking away the view of natural surroundings.
- One (1) respondent is concerned with noise levels and his children waking up at night when trains pass by, as they do sometimes. It is unacceptable to have more trains passing by.
- One (1) respondent is concerned with increased noise and vibration from passing rail near the Thornton's Corners GO Station, in particular with accelerating and decelerating trains going east from the proposed station. The proposed tunnel under the GM spur would increase the grade of the tracks significantly and thereby the sound level of the trains. Trains have a significant low frequency component to their sound, particularly while under hard acceleration. Typical house construction has poor performance at low frequencies. Asked several questions related to train idling, warming up and storage; noise and vibration study and criteria; proposed track grade; anticipated sound levels for nearby homes; and method of construction for new rail lines. Encourages the implementation of noise walls along the north side of the tracks to help mitigate sound level increases. Supportive of the expansion of public transit, but concerned with increased rail traffic between the Thornton's Corners GO Station and Bowmanville.
- One (1) respondent is concerned with more trains nearby. We bought our home here because we knew the tracks were not very busy, now I may have to put up with other trains. I live in a very old home and the few trains now make my house shake.

Safety

- One (1) respondent is concerned about a number of safety issues. Crime is at an all time high in the area – has this been discussed? Schools and parks are located in the area – have measures been taken for our young citizens? Fences are broken on a daily basis and the public walk across the tracks daily. Safety comes first, so is security going to be on the tracks 24/7? Concerned about the public leaving materials on the tracks – we have already had 2 derailments in the City.
- One (1) respondent is concerned with children's safety with the park only separated from the tracks by a fence that is poorly maintained by the City, only for people to open it up again allowing children to access the railroad tracks. There are at least 5 schools that will be affected.

Land Ownership and Access

- A petition was signed by approximately 25 landowners stating that if this project is approved: 1) Home owner's will have property taxes reduced on Mitchell Avenue, Drew Street and George Street, 2) Compensation will be paid when homes are sold due to property depreciation, increased vibrations and noise from increased traffic on railway, and increased traffic in the area, 3) sound barriers to be installed on north side of rail tracks to reduce train noise.
- One (1) respondent is concerned with several items regarding land ownership and access near the Thornton's Corners GO Station and rail crossing route. 1) Driveway Access – There are currently two full access driveways onto Thornton Road servicing our business. Full access to the driveways is very important for operations in respect to parking and vehicular movements. We are concerned that due to the high traffic flows that could be generated by the proposed GO Station, access restrictions (medians) could be established at the proposed intersection of Consumers Drive and Thornton Road. The median could be extended north of the intersection and restrict access to right in turns only to our business. This would have a major impact on our business. As well, we own lands that were designated for the ability to construct another separate industrial/commercial building and business. Concerns are raised that the development of these lands will be restricted by GO Station driveway access. 2) Thornton Road Watermain Cost Sharing Provisions – We have a development agreement that involves the construction and servicing of our business facilities. The agreement included the construction/extension and over sizing of the watermain on Thornton Road south. This is to advise that there are cost recovery provisions in place requiring any lands fronting the subject watermain to provide a share cost payment when the lands are being developed. The proposed Thornton's Corners GO Station fronts onto the subject watermain. 3) GO Transit Land Acquisition Requirements – Based on the maps provided, the north portion of our lands is impacted by the rail line route and bridge crossing. Confirmation is requested as to the amount of land required, particularly as the proposed rail line at this location would be below existing grades. The procedures and timing of the land acquisition process is requested. 4) Construction Impact on Our Business – Concerns are raised as to the large scale and timetable of the proposed infrastructure, particularly the loss of Thornton Road access, during construction. The project includes the urbanization of Thornton Road, GO Train/Thornton Road bridge overpass and the potential of the main CP rail line overpass on Thornton Road. The coordination of these projects is very important to minimize and prevent a closure of the main access route (Thornton Road) to our business. 5) Consumers Drive Extension – Based on the size of the proposed GO Station and the importance of access from both Thornton Road and Consumers Drive, we wish to know the timetable of the extension of Consumers Drive from Thickson Road. Without the extension of this road, further volumes will be focused only onto Thornton Road.

Public Consultation

- One (1) respondent is concerned with several issues regarding public notification and involvement in the project, and is not opposed to development of the GO through Oshawa to Bowmanville, just the choice of where it is being looked at. Prior to the October 13 public meeting it had come to my attention that not all of my neighbours received a letter informing them about the information session. This has led to asking others along this area of proposed development, they have also stated that they did not receive notification. It was also stated that if people were missed through mail it was published in the paper. However, the paper was not present at the meeting to share the information back to the public. If this statement is being used as a way to protect the idea of sharing information, then the paper should have been at the meeting to share the knowledge with the public. I myself feel that this is completely unfair plan as it is well known that this is an established part

of Oshawa and there are several older people who cannot get out to the information meeting and do not have computers or access to a computer to share their thoughts. It has been stated that this is the only form to express concerns with this process so how are these people to express themselves? They rely on others around them.

- One (1) respondent is concerned with municipal and media attention given to the project, and public awareness. Has the City or Province taken any surveys or reported on how the project will affect residents in Oshawa? If so, why are the findings not open to the public, and if not, why are they not being done so the public can see and understand the specific location choices? Why was there no representation from the City of Oshawa or Region of Durham at any meetings? Is it because there was an election, or fear that the candidates might have to answer some unwanted, uneducated questions, or even lack of awareness of GO Station expansion? Why were residents in the area not notified with letters of the meetings held at the Oshawa Holiday Inn on June 16, 17 and 18, 2009? How long have these plans been in existence, and when was the City aware of them, or was it City of Oshawa Council that selected these locations without the citizens knowing? Concerned with the lack of media presence. Was the media informed, or were the meetings scheduled at the same time as the Highway 407 meetings in Oshawa so the public is not aware of the GO Station expansion? Suggested meeting with all parties, including the City of Oshawa, Region of Durham and Province of Ontario with the affecting residents of the specific GO sites, where the residents at that time may ask direct questions to these parties; open to the media as well. Requested disclosure of all studies, surveys, city and provincial budgets, cost analysis and reports to the public, and a schedule timeframe on these programs. Thanked the Project Team for the opportunity to voice concerns and questions.
- One (1) respondent is requesting an extension of the October 29 deadline for more public input as intended. GO Transit has the responsibility to ensure that these notices get delivered properly to the people whose lives will be affected on a daily basis.
- One (1) respondent was concerned that they did not receive a letter to advise them of the public consultation regarding Oshawa Bowmanville expansion, therefore missing an opportunity to provide input to the process. It is also our understanding that large numbers of our neighbours did not receive letters advising us of consultation – can we get another consultation scheduled so that our right to input can be respected. I do not subscribe to Oshawa This Week and feel I should have been notified by letter regarding public meetings.

Other

- One (1) respondent wondered if the City of Oshawa has looked at the costs of building this. Have they set a budget for infrastructure and bridge construction? Is the Oshawa tax payer paying for it, and will it increase my taxes as a resident of the area?
- One (1) respondent indicated that residents of the area have low or fixed incomes and cannot find comparable homes at the same cost. Is the City or Province going to buy our homes so the GO expansion and maintenance facilities can be constructed?
- One (1) respondent suggested that GO Transit should look at establishing a GO Train/Bus Station at Lakeridge Road and Highway 401 at the Ajax Whitby border. The connectivity along the proposed link between Highways 401 and 407 will provide ability for residents of Northern Durham (including Brooklin and Uxbridge) to access the GO Transit system. This station would also alleviate the local road congestion into and out of the current Whitby and Westney Stations. We are suggesting that a station at Lakeridge would be more beneficial at this time than a station on Courtice Road shown as “Darlington Station” on the proposed plans.
- One (1) respondent requested the project be reconsidered.

3. Environmental Conditions

The following sections describe the existing environmental conditions within the Project Limits. Each sub-section provides a brief description of the general corridor and a detailed description of the seven (7) preferred sites, which are being carried forward as part of this Environmental Assessment (EA) (one (1) site includes the Canadian National Railway (CNR) to Canadian Pacific Railway (CPR) Highway 401 crossing). A full identification and description of the seven (7) sites is detailed in **Section 4.2** of this report.

Secondary source information (i.e., maps, websites, reports, etc.) were used to facilitate with characterization of the Project Limits. Much of the data collected were obtained from provincial agencies, local area municipalities, the conservation authority and geographic data sources. Other sources included:

- 1:50,000 scale National Topographic Series (NTS) maps - Map Sheet 30 M/15
- 1:10,000 scale Ontario Base Maps (OBMs)
- 1:63,360 Soils of Ontario Map for the Regional Municipality of Durham provided by the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA)
- Soil Survey of Durham County (1965)
- 1:50,000 scale Paleozoic Geology of Southern Ontario provided by the Ministry of Northern Development and Mines (MNDM)
- Ministry of Natural Resources (MNR) Natural Heritage Information Centre (NHIC) website
- MNR Biodiversity Explorer Website
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC) website
- Species at Risk in Ontario website
- Fisheries and Oceans Canada (DFO) 2010 Aquatic Species at Risk Mapping
- Local and Regional Official Plans including applicable Zoning By-laws.

In addition to the above secondary sources, a number of individual factor specific environmental reports were carried out as part of this study to confirm/augment the secondary source information received, including:

- A Natural Environmental Conditions Report – outlining the existing natural environmental features within the Project Limits and recommended proposed mitigation to negate environmental impacts;
- A Corbett Creek Watershed Flood Study – to update the existing flood mapping to the proposed GO facilities within the Watershed;
- A Stormwater Management Report – outlining the stormwater management plan for the proposed East Rail Maintenance Facility (ERMF)
- An Air Quality Assessment Report – to assess/determine air quality as a result of the commuter rail expansion to Bowmanville;
- An Environmental Noise and Vibration Assessment– to assess/determine the level of impacts and mitigation as a result of the commuter rail expansion to Bowmanville; and
- A Stage 1 to Stage 3 Archaeological Assessment – to confirm the extent of impacts to potential archaeological resources within those areas directly impacted by construction.

3.1 Natural Environment

3.1.1 Physiography, Geology and Topography

A review of 1:50 000 Paleozoic geology mapping for Southern Ontario indicates that the Project Limits as illustrated in **Figure 1** is directly situated within one (1) geological formation known as the Lindsay Formation. This formation, which is part of the Simcoe Group, is described as a nodular to black laminated limestone (Armstrong and Dodge, 2007).

The Project Limits are situated within one (1) physiographic region known as the Iroquois Plain. The Iroquois Plain extends around the western part of Lake Ontario, from the Niagara River to the Trent River, a distance of approximately 305 km. Across the Regional Municipality of Durham, the Plain is characterized by a fairly constant pattern. Due to topographic features of the plain, the coarse sandy soil is not very productive and is predominately covered by cedar thicket. With the exception to the dry sandy terrace north of Oshawa, the physiographic characteristics of this Plain are generally a mosaic of till plains, drumlins, and areas of silty lacustrine deposits (Chapman and Putnam, 1984).

The topography within the Project Limits are generally described as gently increasing in elevation from the proposed ERMF at the western limits of the study area to the eastern limits at the Martin Road station. Additional topographic site details are further discussed below and categorized by each proposed GO facility.

East Rail Maintenance Facility Site

The ERMF site is predominately situated between South Blair Street at approximately 80 metres above sea level (masl) and Hopkins Street at approximately 88 masl. It is noted that the Hopkins Street bridge is approximately 95 masl at the existing CNR line crossing. Those lands situated immediately east of Hopkins Street are characterized by a higher terrain at approximately 96 masl.

CNR to CPR Crossing Site

The crossing site south of Highway 401, immediately north of the existing CNR line is characterized by an approximately 84 masl terrain, with a small increase to 88 masl north of Victoria Street. Immediately north of Highway 401, the terrain slightly undulates from approximately 95 masl to approximately 90 masl on the west side of Corbett Creek and rises to approximately 93 masl immediately west of the Thornton Road GO Station site. On the east side of Thornton Road, the topography increases to 108 masl before gently sloping to approximately 104 masl at the proposed parallel connection to the CPR Right-of-Way (ROW).

Thornton Road GO Station Site (Thornton's Corners)

The Thornton Road GO Station site is situated on a terrain, which ranges from approximately 93 masl within the future parking area expansion to 110 masl located immediately west of Thornton Road.

Ritson Road GO Station Site (Oshawa GO Station NEW)

This GO Station site is situated on relatively flat lands of approximately 100 masl on either side of the existing CPR line.

Courtice Road GO Station Site (Darlington GO Station)

The topography within Trulls Road and Courtice Road, within the Courtice Road GO Station site is characterized by a small decline from north to south. The topography on the north side of the site is 112 masl while the south side of the station site, immediately north of the CPR line is characterized by an approximately 103 masl elevation.

Rundle Road Layover Facility Site

Those lands located immediately south of the CPR line between Solina Road and Rundle Road are characterized by a gently increasing topography from approximately 113 masl immediately east of Solina Road to approximately 115 masl immediately west of Rundle Road.

Martin Road GO Station Site (Bowmanville GO Station)

The northern section of the Martin Road GO Station site is characterized by an approximately 115 masl immediately south of Prince William Boulevard and 117 masl immediately adjacent to the CPR line. South of the CPR line, the terrain gently increases to approximately 120 masl with some additional undulating exceeding 123 masl on the north side of Aspen Springs Drive.

3.1.2 Soils and Agricultural Capability

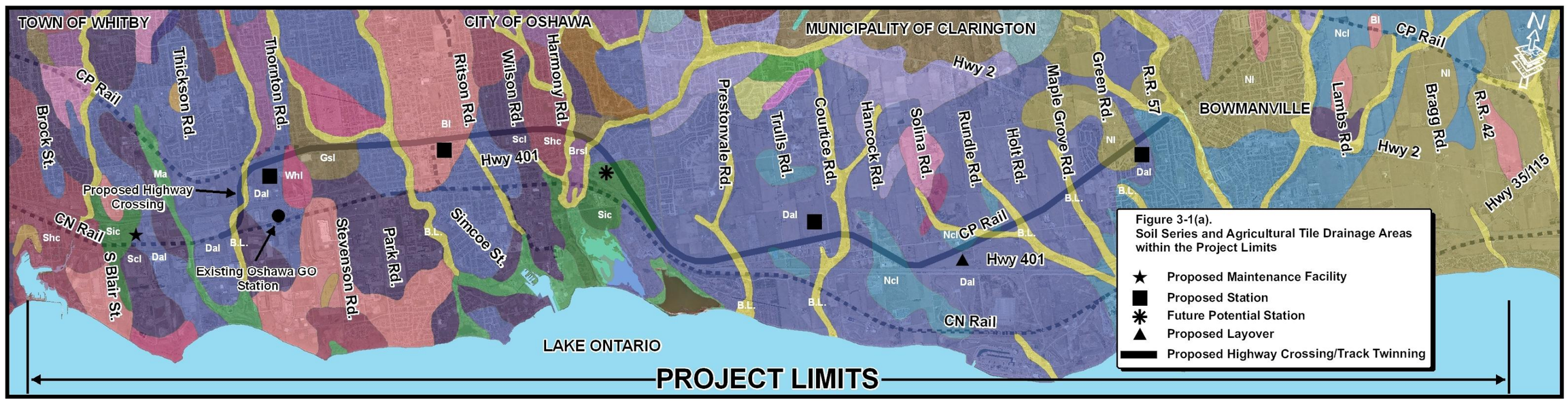
Soils within Durham Region are documented within the *Soil Survey of Ontario County – Report No. 23 of the Ontario Soil Survey* (Olding, Wicklund and Richards, 1950) and *Durham County – Report No. 9 of the Ontario Soil Survey* (Webber, Morwick and Richards, 1946). Review of the Soil Surveys identifies several soil series within the Project Limits, as documented in **Table 3.1** below. The proposed GO facilities will impact approximately nine (9) soil types within the Project Limits. The proposed track twinning will impact additional soil types within the existing CNR/CPR line Right-of-Way (ROW). As illustrated in **Figure 3-1**, the predominant soil type within the Project Limits is Darlington Loam however additional soil types include Schomberg Clay Loam (Shc) and Brighton Sandy Loam (Brsl).

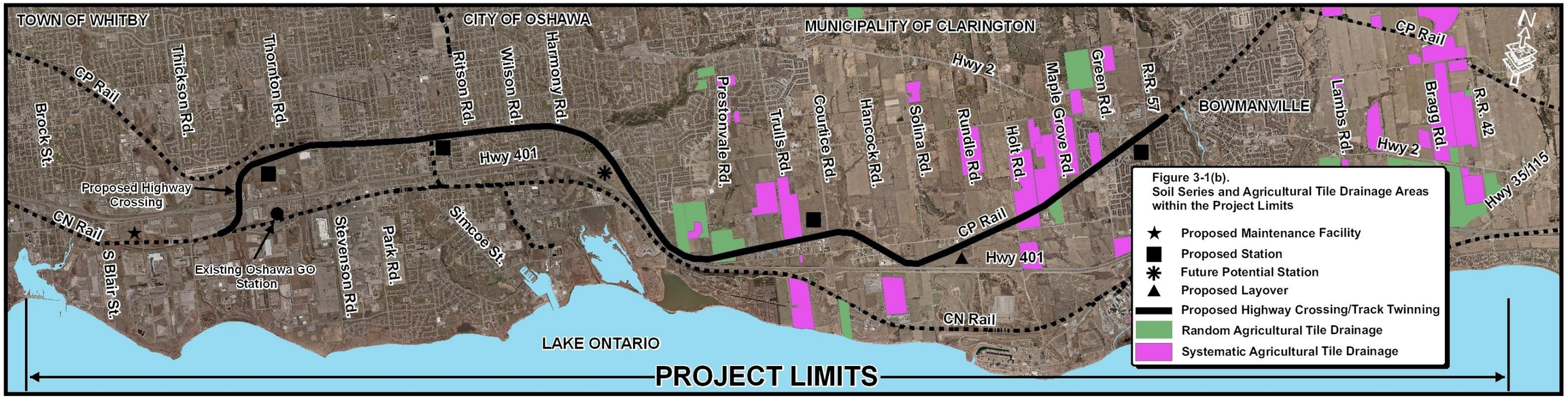
Table 3.1 Soil Series within the Project Limits

Location	Soil Type(s)	Soil Classification(s)	Soil Description(s)	Existing Land Uses(s)
ERMF Site	Simcoe Clay Loam (Sic)	CLI 2 – soils in this class have moderate limitations which restrict the range of crops or require moderate conservation practices. The soils are deep and hold moisture well	Level to depressional topography and virtually stonefree with poor drainage. Soils are very fertile but have limited productivity because of their poor drainage	Agriculturally used as a corn field. Existing commercial establishments
	Smithfield Clay Loam (Scl)	CLI 1 – soils in this class have no significant limitations in use for crops. They can be managed and cropped without difficulty	Nearly level; fair to poor drainage. With improved drainage, this soil type can adapt well to general farming	Agriculturally used as a corn field
	Darlington Loam (Dal)	CLI 1 – see above	Undulating to rolling topography with few stones and good drainage	Agriculturally used as a corn field with some treed/wetted areas
	Darlington Loam (Dal)	CLI 1 – see above	See above	Agricultural
CNR to CPR crossing Site	Bottom Land (B.L.)	CLI 5 – soils in this class have very severe limitations, which restrict their capability to producing perennial forage crops. Improvement practices are feasible	Level topography with variable stoniness and variable drainage	Corbett Creek watercourse crossing
	Smithfield Clay Loam (Scl)	CLI 1 – see above	See above	Wetted area adjacent to Corbett Creek
	Darlington Loam (Dal)	CLI 1 – see above	See above	Agriculturally used as a corn field adjacent to Thornton Road
	Whitby Loam (Whl)	CLI 1 – see above	Gently undulating and slightly stony imperfectly drained soils derived from limestone and shale	GM Spur Line east of Thornton Road (vacant scrubland)
	Granby Sandy Loam (Gsl)	CLI 4 – soils in this class have severe limitations which restrict the range of crops, or require special conservation practices, or both	Depressional topography with very few stones with poor drainage capabilities	Vacant scrubland adjacent to Smart Centre commercial establishment
Thornton Road GO Station Site	Darlington Loam (Dal)	CLI 1 – see above	See above	Agriculturally used as a corn field adjacent to Thornton Road
Ritson Road GO Station Site	Bondhead Loam (Bl)	CLI 1 – see above	Rolling topography and slightly to moderately stony with good drainage. Soil materials derived from calcareous grey loam and sandy loam till	Situated within CPR tracks (north of the CPR main line) within Cowan Park. Derelict grocery store building south of main line

Location	Soil Type(s)	Soil Classification(s)	Soil Description(s)	Existing Land Uses(s)
Courtice Road GO Station Site	Darlington Loam (Dal)	CLI 1 – see above	Undulating to slightly rolling topography with fair to good drainage. High in lime, few stones	Agriculturally used as a corn field
Rundle Road Layover Facility Site	Darlington Loam (Dal)	CLI 1 – see above	See above	Agriculturally used as a winter wheat field
	Newcastle Clay Loam (Ncl)	CLI 1 – see above	Undulating to slightly rolling topography with fair to good drainage. High in lime but relatively stonefree	Agriculturally used as a winter wheat field
Martin Road GO Station Site	Newcastle Loam (Nl)	CLI 1 – see above	Undulating to slightly rolling with fair to good drainage. High in lime with some stones	Vacant disturbed land adjacent to subdivision development
	Darlington Loam (Dal)	CLI 1 – see above	See above	Vacant disturbed land adjacent to subdivision development

Figure 3-1 Soil Series and Agricultural Tile Drainage Areas within the Project Limits





As further illustrated in **Figure 3-1**, Agricultural Tile Drainage (ATD) information obtained from Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) identifies several random and systematic tile drainage areas within the Project Limits. Although the tile drainage areas immediately adjacent to the CNR line would have been built outside of the CPR line ROW, the systematic tile drainage immediately west of the proposed Courtice Road GO Station may require some modifications as this station site will change the landscape drainage functionality of the area.

3.1.3 Drainage and Stormwater Management

The Project Limits are entirely situated within the jurisdiction of the Central Lake Ontario Conservation Authority (CLOCA), which includes a jurisdictional boundary of approximately 627 km² and is defined by 15 watersheds (CLOCA Website, 2009). As noted in **Table 3.2,** there are nine (9) watersheds situated within the Project Limits from 500 m west of Brock Street in the Town of Whitby to 500 m east of Regional Road 42/Darlington-Clarke Townline Road in the Municipality of Clarington. Within each watershed, there are several watercourse crossings that traverse the Project Limits, which are described below and are categorized by each proposed GO facility. In sum, the Project Limits will traverse approximately 13 watercourse crossings along the CNR line and the CPR line. These watercourse crossings within each respective watershed are further illustrated in **Figure 3**.

Table 3.2 CLOCA Watersheds Directly within the Project Limits

Watershed	Draining Area	Total Stream Length	Number of Watercourse Crossings	Proposed GO Facilities
Pringle Creek	2,847 ha	39 km	One (1) – CNR line (Pringle Creek)	ERMF
Corbett Creek	1,455 ha	25 km	One (1) – CNR to CPR line (Corbett Creek)	ERMF, CNR to CPR line Crossing, Thornton Road GO Station
Oshawa Creek	12,048 ha	357 km	One (1) – CPR line (West Oshawa Creek)	Ritson Road GO Station, Track Twinning
Black/Harmony/Farewell Creek	10,726 ha	224 km	Three (3) – CPR line (Harmony/Farewell Creek)	Track Twinning
Robinson Creek	570 ha	13 km	One (1) – CPR Line (Robinson Creek)	Layover Facility, Track Twinning
Tooley Creek	1,050 ha	26 km	Two (2) – CPR Line (Tooley Creek)	Layover Facility, Courtice Road GO Station, Track Twinning
Darlington Creek	1,636 ha	38 km	Four (4) – CPR Line (Darlington Creek)	Track Twinning
Westside Creek	573 ha	9 km	N/A	Martin Road GO Station, Track Twinning
Bowmanville/Soper Creek	16,589 ha	438 km	N/A	East limit of Martin Road GO Station, Track Twinning

Additional information received from CLOCA identifies that the CNR line to CPR line Highway 401 crossing is directly situated within the Corbett Creek 100-Year Floodplain, as per the Corbett Creek Floodplain Mapping, 2005. To this end, a Corbett Creek Watershed Flood Study was completed as part of this assignment. The purpose of this study is to establish the existing hydrologic and hydraulic conditions of Corbett Creek within the Project Limits, assess the potential impacts of the proposed connecting tracking on flooding in Corbett Creek, as well as evaluate alternatives to mitigate any potential flooding impacts.

Corbett Creek has a total drainage area of 1463 ha, which is split between the East and West Branches of Corbett Creek. The two branches meet just upstream of the outlet to Lake Ontario. Both of the potential GO Transit rail crossings are located on the East Branch. The total drainage area to the north crossing location is approximately 380 ha, and the drainage area to the crossing just upstream of the CNR corridor is approximately 590 ha.

East Corbett Creek crosses under the CPR rail corridor just west of Thornton Road and continues in a southerly direction to Highway 401. Immediately downstream of Highway 401, Corbett Creek flows westward along the north side of Victoria Street. A smaller tributary joins the east branch at Victoria Street, and the creek continues southward to a relatively small culvert under the CNR corridor.

As part of this study, CLOCA provided AECOM with hydraulic modeling and flood plain mapping for Corbett Creek, as well as a report entitled 'Digital Floodline Mapping Update for the Corbett Creek Watershed' prepared by Greck & Associates (2006). This report documented the development of the hydrologic and hydraulic models and flood plain mapping (Greck & Associates, 2006).

The 2006 report for Corbett Creek found that the existing culvert under the CNR tracks is significantly undersized relative to the regional storm (Hurricane Hazel) peak flow to the crossing. Using traditional (conservative) flood plain mapping practices, the CNR tracks were predicted to be overtopped. Given the significant height of the CNR embankment and the relatively flat land to the north, the resulting flood plain covered an unreasonably large area.

Given the potential for the proposed GO track to impact the Corbett Creek flood plain, the 100-year storm and regional storm hydrographs for East Corbett Creek at the CNR crossing were obtained from Greck & Associates. AECOM updated the stage-storage characteristics of the flood plain using the same approach as Greck & Associates, but with the aid of more detailed topographic mapping. The stage-discharge relationship for the existing CNR culvert was calculated using the HEC-RAS model for Corbett Creek. Further discussion pertaining to the proposed drainage improvements as a result of the proposed undertaking within the Corbett Creek Floodplain area is discussed in **Section 4.2.8** of this report. The drainage study for Corbett Creek is provided in **Appendix C** of this report.

With the proposed implementation of the ERMF, which drains to both the Pringle Creek and Corbett Creek watersheds, a stormwater management plan has been developed using the SWMHYMO hydrological model. As noted within the Stormwater Management Report contained in **Appendix C** of this report, the proposed ERMF site area was divided into four (4) sub-catchment areas. It is noted that each of the four (4) sub-catchments were represented in the SWMHYMO model using the CALIB NAHSHYD command. This command is recommended for modeling rural drainage areas, and requires a Curve Number (CN), Initial Abstraction depth (Ia) and Time to Peak (Tp) as input. Details regarding the proposed stormwater improvements at this location are discussed in **Section 4.2.1**.

3.1.4 Groundwater Resources

The influence of subsurface materials on groundwater movement necessitates a description of the geology within the Analysis Area. Although the characteristics of the underlying bedrock are important in understanding regional-scale aquifers and groundwater, the shallow overburden sediments are most relevant to this study, given their thickness and the relatively shallow impacts associated with construction of the proposed works.

The existing CP rail corridor is primarily located in the Newmarket Till[7]. The Newmarket Till was deposited initially into standing water by a Late Wisconsinan advance of the Laurentide Ice Sheet. It is laterally extensive within the Greater

[7] *407 East – Environmental Assessment Report*

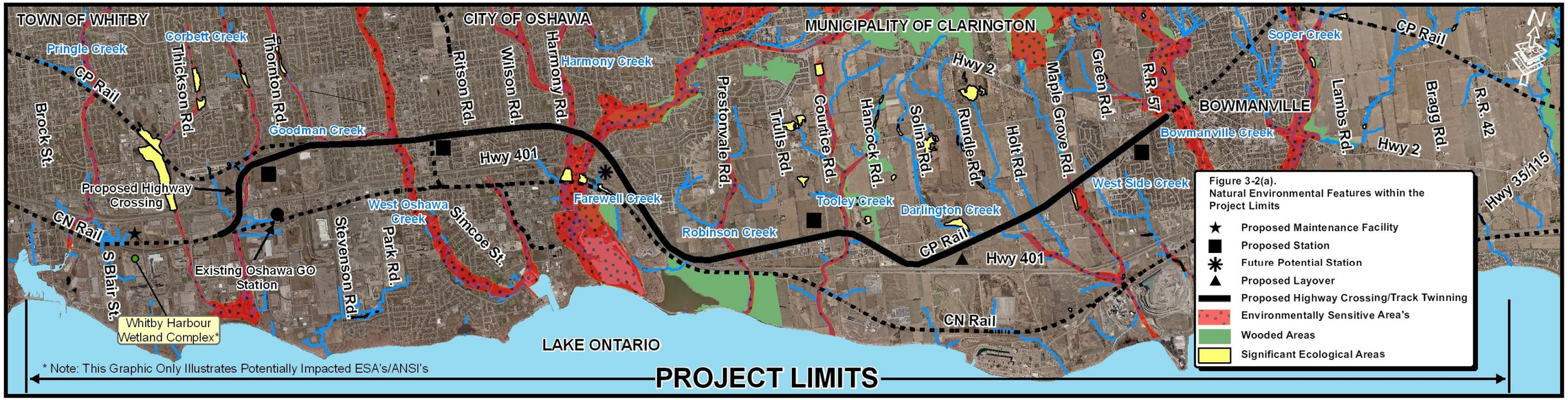
Toronto Area and extends across the entire Analysis Area. The Newmarket Till has a distinct and consistent lithology[8] and is dense, stony, sandy silt diamicton, ranging in thickness from about 5 to 50 m. It occurs as beds 3 to 5 m thick, locally separated by stone lines and sandy interbeds that are 1 to 5 m thick[9]. Most drumlins within the Study Area, including those in the Bowmanville area, are composed of Newmarket Till (older documents refer to the Newmarket Till as the Bowmanville Till), although this term is no longer in use). The hydrogeological significance of the Newmarket Till is that it separates the major underlying aquifers from the permeable Oak Ridges Moraine sediments.

3.1.5 Fisheries Resources

Secondary background information received from CLOCA as well as the Ministry of Natural Resources (MNR) indicates that there are nine (9) watersheds and several fish species present within the Project Limits along the CNR to CPR line. In addition, the project team undertook environmental field work and prepared a Natural Environmental Conditions Report as part of this study. The following sections of the EPR summarize the findings. The full report is contained in **Appendix D** of this report. **Table 3.3** lists a range of fish species present within the Project Limits. It is noted that the ERMF site as well as the CNR to CPR line crossing over Highway 401 will directly traverse Pringle Creek and Corbett Creek respectively. The remaining 11 watercourse crossings within the Project Limits will be directly traversed by the track twinning along the CPR line.

[8] *Sharp* et al.., *1999*
[9] *Ibid*

Figure 3-2 Natural Environmental Features within the Project Limits



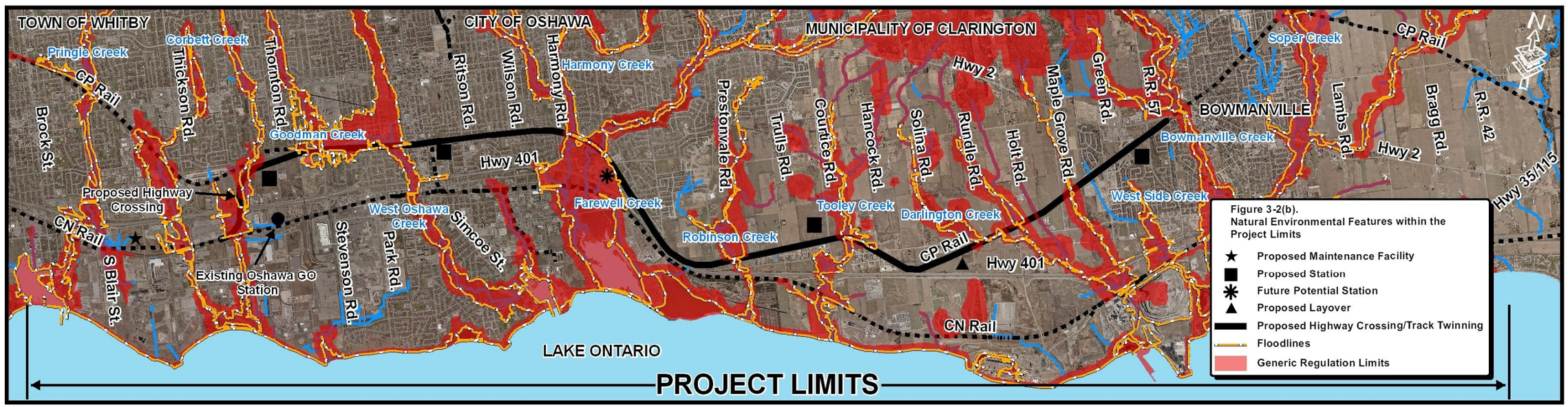


Table 3.3 Fish Species Present within the Project Limits

Watershed	Thermal Regime	Approximate Location of Watercourse	Sampling Date and Fish Species Present*	Proposed GO Facilities
Pringle Creek	Coolwater	120 m east of South Blair Street	July 2003 – fathead minnow, threespine stickleback, northern redbelly dace, brook stickleback	ERMF
Corbett Creek	Coolwater	560 m west of Thornton Road	July 2003 – white sucker, blacknose dace, brook stickleback	CNR to CPR line Crossing
Oshawa Creek	Coolwater	450 m east of Park Road S	June 2000 – chinook salmon, rainbow trout, white sucker, blacknose dace, longnose dace, smallmouth bass, johnny darter, mottled sculpin	Track Twinning
Black/Harmony/ Farewell Creek	Coolwater	Two (2) branches to Harmony Creek – 350 m west of Harmony Road S and 160 m east of Harmony Road S	August 2002 – Goldfish, blacknose dace, creek chub, white sucker, bluntnose minnow, longnose dace, largemouth bass	Track Twinning
Black/Harmony/ Farewell Creek	Coldwater	One (1) branch of Farewell Creek – 480 m east of Harmony Road S	June 2002 – lamprey sp., white sucker, bluntnose minnow, fathead minnow, blacknose dace, longnose dace, creek chub, brown bullhead, pumpkinseed, rainbow darter, johnny darter	Track Twinning
Robinson Creek	Coolwater	380 m east of Prestonvale Road	August 2003 – rainbow trout, white sucker, fathead minnow, blacknose dace, creek chub, brook stickleback, johnny darter	Track Twinning
Tooley Creek	Coldwater	Two (2) branches to Tooley Creek – 290 m east of Courtice Road and 700 m east of Courtice Road	July 2003 – fathead minnow, brook stickleback, creek chub	Track Twinning
Darlington Creek	Warmwater/Cold water	Four (4) branches to Darlington Creek – 270 m east of Rundle Road, 40 m east of Holt Road, 390 m east of Holt Road, and 230 m east of Maple Grove Road.	June 2003 – pumpkinseed, brook stickleback, fathead minnow	Track Twinning

Note: Fish sampling information was received from CLOCA Aquatic Monitoring, 2009.

Fish species data was received from monitoring stations closest to the rail line, and proposed GO facilities. Thus, there is a likelihood of additional fish species observations within each watercourse, outside of the Project Limits.

Existing aquatic features within the Project Limits were assessed by reviewing existing data and conducting site investigations in 2009. Existing data included CLOCA fish sampling, Oshawa Creek Aquatic Resources Management Plan and the Bowmanville/Soper Creek Watershed Aquatic Resource Management Plan. Aquatic habitat assessments were not made at all watercourse crossings. Data collected in field investigations conducted by AECOM included general physical habitat, water quality and representative photographs. Ecological field investigations were undertaken along the preferred plan on July 30th, August 4th, August 12th, August 18th and October 29th, 2009. The findings for the aquatic environment for each proposed development are described below.

East Rail Maintenance Facility Site

The ERMF footprint covers a section of a small tributary located east of the main branch of Pringle Creek south of Victoria Road. CLOCA fish sampling in 2003 at this site resulted in captures of fathead minnow, threespine stickleback, northern redbelly dace and brook stickleback. AECOM (2009) states, “the fish community of the Pringle Creek watershed includes: rainbow trout, chinook salmon, white sucker, walleye (Sander vitreus), pumpkinseed (Lepomis gibbosus), and largemouth bass, among others”. This section of Pringle Creek is coolwater as indicated by the fish community (Coker, 2001), and the thermal regime is coolwater as shown through CLOCA temperature logger monitoring data. The maintenance facility footprint also covers a headwater feature through the main agricultural field. This feature functions only as water conveyance and does not contain fish habitat.

This site has a Medium Watercourse Sensitivity Ranking. It is not a high quality habitat and it is not a channel of Pringle Creek. It likely provides some Rainbow Trout nursery/rearing habitat in the lower section upstream of the main branch of Pringle Creek, although there is likely no adult salmonid migration within this section and is mainly used by coolwater fish species.

CNR to CPR Crossing Site

At this site, there is a proposed track extension from CPR to CNR with a cross-over of Highway 401. The track extension crosses Corbett Creek three (3) times. Starting at the CPR line in the north, the first crossing of Corbett Creek is approximately 120 m south of the CPR line. At the time of the field visit in October 2009, Corbett Creek in this reach was dammed by beaver activity and an active lodge building was evident. The proposed crossing site would be situated directly at the beaver dam location as well as through a well established riparian zone. The second proposed crossing of Corbett Creek occurs between HWY 401 and Victoria Street. The creek was confined to linear flow between two road banks. Watercress and cyprinids were observed in this reach. The third crossing would occur between the CNR Line and south of Victoria Road. Watercress, cyprinids and slumping banks were common features in this section.

CLOCA fish sampling at the Champlain Road crossing in 2003 resulted in captures of blacknose dace, white sucker and brook stickleback. AECOM (2009) reports that 2005 CLOCA data states, “The fish community of the Corbett Creek watershed includes chinook salmon, white sucker, pumpkinseed, brown bullhead (*Ameiurus nebulosus*) and northern Pike (*Esox lucius*), among others.”

This site has a Medium Watercourse Sensitivity Ranking. Chinook Salmon have been observed in Corbett Creek in the fall, but it is unknown if a substantial run exists. There are potential pike spawning areas and groundwater upwelling areas (patches of watercress).

Thornton Road GO Station Site (Thornton's Corners)

The footprint of Oshawa West Station at Thornton Road occurs to the south and east of Corbett Creek. The northwest corner of the footprint is situated approximately 30 m from Corbett Creek as it flows south and then east from the culvert under the railway.

This location has a Medium Watercourse Sensitivity Ranking. Chinook Salmon have been observed in Corbett Creek in the fall, but it is unknown if a substantial run exists. There are potential pike spawning areas and groundwater upwelling areas (patches of watercress).

Ritson Road GO Station Site (Oshawa GO Station NEW)

There are no aquatic features at the Ritson Road Station. The rail line crosses Oshawa Creek approximately 750 m west of the proposed Ritson Road site. Oshawa Creek at this site consists generally of riffles and runs with substrates of mainly cobbles, boulders and gravels. Oshawa Creek provides habitat for a diverse fish community including a migration route for salmonids (CLOCA, 2000). The Oshawa Creek Watershed Management Plan (2002) reports that 20 native fish species, including brook trout, were captured in the Oshawa Creek system. Four (4) non-native species were also captured: rainbow trout; brown trout; chinook salmon; and goldfish. This section of Oshawa Creek is coldwater as indicated by the fish community (Coker, 2001), and the thermal regime is coolwater as shown through CLOCA temperature logger monitoring data.

Courtice Road GO Station Site Darlington GO Station)

A headwater drainage feature is present in the centre of the proposed footprint of the Courtice Road Station. This feature conveys, in a southerly direction, storm and meltwater, as well as possibly groundwater from the agricultural fields to the north. This system is likely seasonal and intermittent in nature. Fish habitat is not present. This site has a Low Watercourse Sensitivity Ranking. The drainage feature conveys storm and melt water.

To the east of the Courtice Road Site, the rail crosses Tooley Creek. Tooley Creek is approximately 1.5 m wide (wetted width) and also flows through scrubland adjacent to agricultural crop fields. CLOCA fish sampling 250 m downstream at Baseline Road in 2003 resulted in captures of coolwater cyprinids and brook stickleback. Tooley Creek also provides habitat for Rainbow Trout, and CLOCA Aquatic Monitoring has captured young-of-the-year Rainbow Trout for numerous seasons downstream of the subject area. This site has a High Watercourse Sensitivity Ranking. Rainbow Trout reproduce successfully within the subject area.

Rundle Road Layover Facility Site

There are no aquatic features at the Rundle Road Layover site.

Martin Road GO Station Site (Bowmanville GO Station)

There are no aquatic features at the Martin Road Station.

With the selection of the Rundle Road Layover Facility and the Martin Road GO Station Site, streams east of Martin Road will not be affected by this project. However the following streams were studied for previous options and are presented here for completeness.

The rail line crosses four branches of Darlington Creek east of the Martin Road Station site. This is a coolwater system as indicated by the fish community (Coker, 2001), and the thermal regime is coolwater as shown through CLOCA temperature logger monitoring data. All CLOCA fish sampling efforts in 2003 in the vicinity of the four rail crossing sites resulted in captures of generally tolerant, coolwater species with the exception of young-of-the-year Rainbow Trout which is a coldwater sensitive species. Darlington Creek may also provide habitat for rainbow trout at these crossings. This site has a Medium Watercourse Sensitivity Ranking. Rainbow Trout reproduce successfully downstream of the subject area.

East of Martin Road, the rail crosses Bowmanville and Soper Creeks. Both Bowmanville and Soper Creeks are high quality creeks with diverse fish communities including several salmonid species. These sections of the Creeks are coldwater as indicated by the fish community (Coker, 2001), and the thermal regime is coolwater as shown through CLOCA temperature logger monitoring data. This site has a High Watercourse Sensitivity Ranking. Sensitive salmonids are present within the subject area.

3.1.6 Vegetation

Field investigation methods used to describe the terrestrial communities included a combination of Rapid Ecological Land Classification (ELC) delineation following those guidelines outlined by the MNR (Lee *et al*, 2009) for the description of vegetation communities over 0.5 ha in size, and a comprehensive floral species list. Where wetland communities occur, wetland delineation according to the Ontario Wetland Evaluation System for Southern Ontario (3rd edition) was utilized to confirm/revise wetland boundaries. Ecological field investigations were undertaken by AECOM along the preferred plan area on July 30th, August 4th, August 12th, August 18th and October 29th, 2009. A Permission to Enter (PTE) agreement was forwarded to 14 land parcel owners to conduct field visits within the following sites:

East Rail Maintenance Facility – East of Thickson Road – This site, for the most part, lies between South Blair Street and Hopkins Street south of Victoria Street. Based on landownership the site has been divided into eight parcels.

Highway 401 CNR to CPR Crossing – This site is located both north and south of Highway 401 and Victoria Street. Based on landownership the site has been divided into four parcels.

Thornton Road GO Station (Thornton's Corners) - This site is west of Thornton Road, just south of the existing CPR line. Most of the site is open field with scattered trees, however a small woodlot occupies the northwest corner of the site

Ritson Road Station (Oshawa GO Station NEW) – This site is located west of Ritson Road and has been divided into three parcels based on land ownership.

Courtice Road Station (Darlington GO Station) - Site 5 is located west of Courtice Road just north of the existing CPR line. Based on landownership the site has been divided into two parcels.

Rundle Road Layover –This site is located south of Baseline Road, west of Rundle Road. Based on land ownership the site has been divided into five parcels.

Martin Road Station (Bowmanville GO Station) - This site is located north of Aspen Springs Drive, west of Martin Road. Based on land ownership the site has been divided into three parcels.

East Rail Maintenance Facility Site

The prominent terrestrial feature within the proposed maintenance facility yard footprint is agricultural field. Other vegetation features include cultural thicket, cultural meadow, tree stands, hedgerows and an unevaluated isolated wetland pocket.

The unevaluated isolated wetland pocket is approximately 0.18 ha in size and is within 335 m of the Whitby Harbour Provincially Significant Wetland (PSW) Complex. It contains cattail (*Typha lattifolia*) robust emergent marsh wetland communities. This patch has not been evaluated according to the Ontario Wetland Evaluation System for Southern Ontario (3rd edition). Considering its size, low biodiversity and isolated nature, there is not enough significant rationale for it to be complexed with the nearby Whitby Harbour PSW Complex. Through a preliminary wetland evaluation, this wetland patch does not satisfy the requirements to be considered provincially significant. This assessment will have to be confirmed through a formal wetland evaluation and be approved by the MNR.

Potentially affected communities as delineated through MNR's Ecological Land Classification guidelines include: MAS2-1: Cattail Shallow Marsh Type (MASM1-1*); CUT1: Mineral Cultural Thicket Ecosite (THDM2); CUM1-1: Mineral Cultural Meadow Type (MEFM1); annual row crops (OAGM1); and treed hedgerow (TAGM5) (**Figure 3-3**).

The major terrestrial feature indirectly associated with the site is the Whitby Harbour PSW Complex. This PSW occurs to the south of the CNR line east of South Blair Street. Cattail robust emergent marsh is the prominent wetland community. The limits of the PSW are not within the footprint of the proposed ERMF yard; however Pringle Creek connects the lands via a culvert beneath the CNR line.

A "High Significance Terrestrial Feature" within this location is the Whitby Harbour PSW Complex which has been evaluated as provincially significant according to the Ontario Wetland Evaluation System for Southern Ontario (3rd edition). This feature is outside the proposed footprint by approximately 66 m. An unevaluated isolated wetland pocket has been determined to be a "Medium Significance Terrestrial Feature", though through a formal wetland evaluation process it could be considered locally significant. "Low Significance Terrestrial Features" in this area are comprised of a cultural meadow and thicket and treed stands due to their disturbed nature, small size and proximity to Highway 401, and lack of connectivity to other significant natural features.

CNR to CPR Crossing Site

The terrestrial features affected by the proposed crossing include woodland, wetland, meadow, treed stand and thicket communities which occur along the banks/riparian area of Corbett Creek.

The wetland communities along Corbett Creek have not been formally evaluated according to the Ontario Wetland Evaluation System for Southern Ontario (3rd edition) and are identified as "unevaluated" according to CLOCA's GIS database. During the 2009 investigations further wetland communities not identified on CLOCA's database were discovered and account for approximately 2.5 ha. The wetland communities within the unevaluated wetlands are comprised primarily of meadow marsh types which include asters, cattail, grasses and a variety of forb species. An assessment will have to be completed through a formal wetland evaluation and be approved by the MNR.

A woodland approximately 0.9 ha in size occurs along the southern limits of the CPR line. This patch is dominated by mid-aged Manitoba maple (*Acer negundo*) and basswood (*Tilia americana*) trees.

Communities delineated through MNR's Ecological Land Classification guidelines include:
CUM1-1: Dry-Moist Old Field Meadow Type (MEFM1); CUT 1-1: Sumac Cultural Thicket Type (THDM2-1); CUT1: Common Buckthorn Cultural Thicket Ecosite (THDM2-6); MAM2-2 Mosaic (MAMM1-3); MAS2-1: Cattail Shallow Marsh Type (MASM1-1); MAM2: Common Reed Grass Mineral Meadow Marsh Type (MAMM1-12); SWT2-5: Red Osier Dogwood Mineral Thicket Swamp (SWTM2-1); MAM2-10: Forb Mineral Meadow Marsh Type (MAMM2-4); FOD 7: Fresh-Moist Lowland Deciduous Forest (FODM7); and SWD4: Mineral Deciduous Swamp Ecosite (SWDM4).

The major terrestrial feature indirectly associated with the proposed site is the Corbett Creek Coastal Wetland Complex. This feature occurs south of the CNR line approximately 200 m from the proposed crossing of Corbett Creek. Corbett Creek connects the lands via a culvert to the evaluated wetland community and a culvert beneath the CNR line (**Figures 3-4 and 3-5**).

A High Significance Terrestrial Feature is Corbett Creek Coastal Wetland Complex which has been evaluated as provincially significant according to the Ontario Wetland Evaluation System for Southern Ontario (3rd edition). This feature is outside the proposed footprint by approximately 0.9 km and is protected according to the Provincial Policy Statement (PPS). Medium Significance Terrestrial Features consist of the unevaluated wetland communities along Corbett Creek, though through a formal wetland evaluation process could be considered locally significant or complexed with the existing PSW since they are within 750 m of the Corbett Creek Coastal Wetland Complex. Low Significance Terrestrial Features in this area are comprised of a cultural meadow and thicket and treed stands due to their disturbed nature, small size and proximity to Highway 401, and lack of connectivity to other significant natural features.

Durham Region has protection measures for woodlands greater than 1 ha in size (Region of Durham, 2008). Since the woodland within this site is 0.9 ha in size, it does not require protection.

Thornton Road GO Station Site (Thornton's Corners)

The terrestrial features affected by this station include woodland along the current rail line. Corbett Creek and its associated wetland riparian areas occur within 100 m of the station layout.

Communities delineated through MNR's Ecological Land Classification guidelines include: CUM1-1: Dry-Moist Old Field Meadow Type (MEFM1); MAM2-2 Mosaic (MAMM1-3); MAM2: Common Reed Grass Mineral Meadow Marsh Type (MAMM1-12); SWT2-5: Red Osier Dogwood Mineral Thicket Swamp (SWTM2-1); MAM2-10: Forb Mineral Meadow Marsh Type (MAMM2-4); and FOD 7: Fresh-Moist Lowland Deciduous Forest (FODM7) (**Figure 3-6)**.

The major terrestrial feature indirectly associated with the site is the Corbett Creek Coastal Marsh. This feature occurs south of the CNR line approximately 200 m from the proposed crossing of Corbett Creek. Corbett Creek connects the lands via a culvert to the evaluated wetland community and a culvert beneath the CNR line.

Corbett Creek Coastal Marsh has been evaluated as provincially significant according to the Ontario Wetland Evaluation System for Southern Ontario (3rd edition) and is considered a High Significance Terrestrial Feature. This feature is outside the proposed footprint by approximately 0.9 km and is protected according to the PPS. The unevaluated wetland communities along Corbett Creek, through a formal wetland evaluation process, could be considered locally significant or complexed with the existing PSW since they are within 750 m of the Corbett Creek Coastal Marsh.

Low Significance Terrestrial Features in this area are comprised of a cultural meadow and treed stands due to their disturbed nature, small size and proximity to Highway 401, and lack of connectivity to other significant natural features.

The Region of Durham has protection measures for woodlands greater than 1 ha in size (Region of Durham, 2008). Since the woodland within this site is 0.9 ha in size, it does not require protection.

Ritson Road GO Station Site (Oshawa GO Station NEW)

The main feature of the Ritson Road Site is the abandoned Knob Hill Farms building and parking lot. The terrestrial features affected by this station include a linear treed stand, cultural meadow and mowed lawn.

Trees along the southern limits of the site consisted of Manitoba maple, trembling aspen, sugar maple, white ash, Norway maple, black walnut, basswood, and American elm and can be classified as FOD5: Dry-Fresh Sugar Maple Deciduous Forest Ecosite (FODM5). Trees within a park block include sugar maple, silver maple and white ash (**Figure 3-7**).

There are no High or Medium Significance Terrestrial Features occurring near the proposed Ritson Road station. Low Significance Terrestrial Features in this area are comprised of a cultural meadow and thicket and treed stands due to their disturbed nature, small size and proximity to Highway 401, and lack of connectivity to other significant natural features.

Courtice Road GO Station Site (Darlington GO Station)

This site is comprised of an agricultural field with a thin strip of a wooded forest/thicket community along the southern boundary of the site. The wooded community is approximately 2.5 ha in size along the current rail line where the dimensions are about 500 m by 5 m. Species include trembling aspen, Manitoba maple, Willow (Salix nigra), riverbank grape, red osier dogwood, reed canary grass, Canada goldenrod, and Canada thistle.

Communities delineated through MNR's Ecological Land Classification guidelines include: CUM1-1: Dry-Moist Old Field Meadow Type (MEFM1); annual row crops (OAGM1); and FOD 8: Fresh-Moist Poplar Deciduous Forest Type (FODM8) (**Figure 3-8**).

There are no High Significance Terrestrial Features occurring near the proposed Courtice Road station. Medium Significance Terrestrial Features consist of the unevaluated wetland communities, though through a formal wetland evaluation process could be considered locally significant. The cultural meadow and treed stands are considered Low Significance Terrestrial Features.

Rundle Road Layover Facility Site

The terrestrial features affected at this site are comprised of an agricultural field and a 1 ha patch of swamp dominated by black ash. This patch is an unevaluated wetland, but not defined as such within CLOCA's database.

Communities delineated through MNR's Ecological Land Classification guidelines include: SWD2-1: Black Ash Mineral Deciduous Swamp Type (SWDM2-1); CUM1-1: Dry-Moist Old Field Meadow Type (MEFM1); and annual row crops (OAGM1) (**Figure 3-10**).

There are no High Significance Terrestrial Features occurring near the proposed Rundle Road layover station. Medium Significance Terrestrial Features consist of the unevaluated wetland communities, though through a formal wetland evaluation process could be considered locally significant. The cultural meadow and treed stands are considered Low Significance Terrestrial Features.

Martin Road GO Station Site (Bowmanville GO Station)

The terrestrial features affected by this site are minimal and include a few trees.

There are no High Significance Terrestrial Features occurring near the proposed Martin Road station. Medium Significance Terrestrial Features consist of the unevaluated wetland communities, though through a formal wetland evaluation process could be considered locally significant. Individual trees are considered Low Significance Terrestrial Features (**Figure 3-9**).

3.1.7 Wildlife

Resident wildlife within the study area dominantly consists of a composition of species able to adapt to a human influenced environment considering the proximity to major cities and transportation networks. The study area consists of two core habitat areas, Oak Ridges Moraine to the north and Lake Ontario to the south. Additionally, large expanses of habitat associated with the former Lake Iroquois shoreline and beach have been designated as PSWs. Watercourse systems link these core areas, bisecting the various municipalities and offering important wildlife corridors. In some areas, these corridor links are marginal due to modifications with a series of culverts and straightened channels used to cross major transportation systems including Highway 401, rail lines and main roads. These modifications have constrained the ability for wildlife movement; however, creek corridors are still utilized by wildlife in the area. The following habitat types can be found within the enhanced study area:

Forest – Large forested areas are not frequent within the study area. This habitat type would be associated with features within the Oak Ridges Moraine;

Wetlands – Wetland areas including swamps, marshes and open water wetlands are associated with the study area's watercourse systems and along the Lake Ontario shoreline. These habitats are particularly important for amphibians, wading birds, shorebirds and waterfowl; and

Meadows/Grasslands/Thickets – These areas are the first stage of succession and appeal to grassland birds, small mammals, and insects such as bees and butterflies that are attracted to the wildflowers. These habitat types are interspersed throughout the study area, especially in areas that have been disturbed.

A total of 80 federally and provincially significant species have been reported within the study area according to CLOCA species records and the NHIC database. Of these 66 species, there are 47 species of birds, 24 species of plants, and nine (9) other wildlife species. Most of these species are not associated with the preferred plan.

The Ontario Breeding Bird Atlas (OBBA) has recorded one hundred and sixty-two bird species as possibly, probably or confirmed to be breeding within survey squares (survey squares are 10 km^2 in size) that overlap the study area. Of these one hundred and sixty-two species, habitat for ninety-eight species is not found within or near the preferred sites (see **Appendix D**). A total of sixty-four species have habitat that is marginally suitable to suitable for breeding within or

near the preferred sites where three (3) are listed as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Additional information pertaining to these species is further discussed below.

Figure 3-3 Ecological Land Classification (ELC) Communities within the ERMF Site

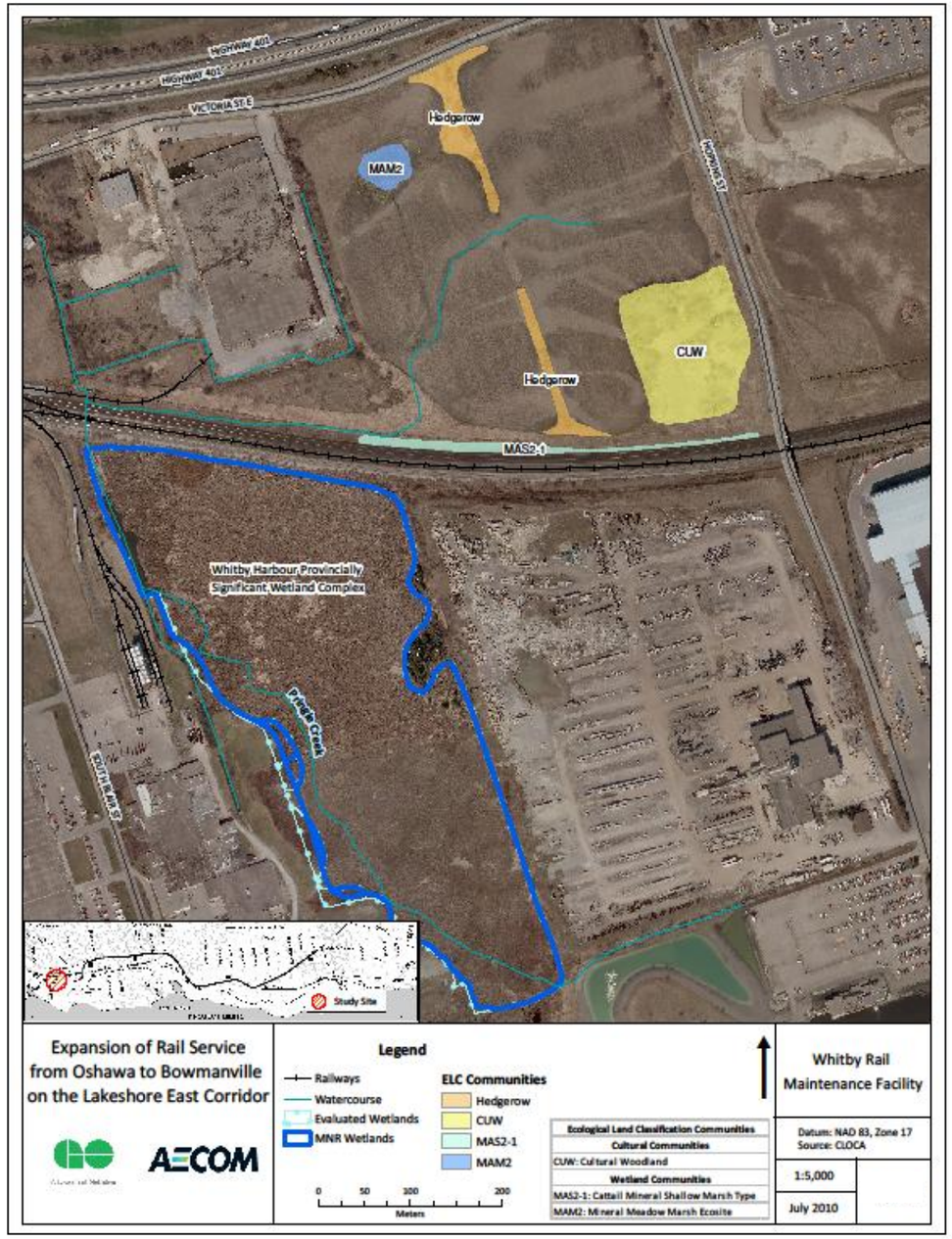


Figure 3-4 Ecological Land Classification (ELC) Communities within the CNR to CPR Crossing Site

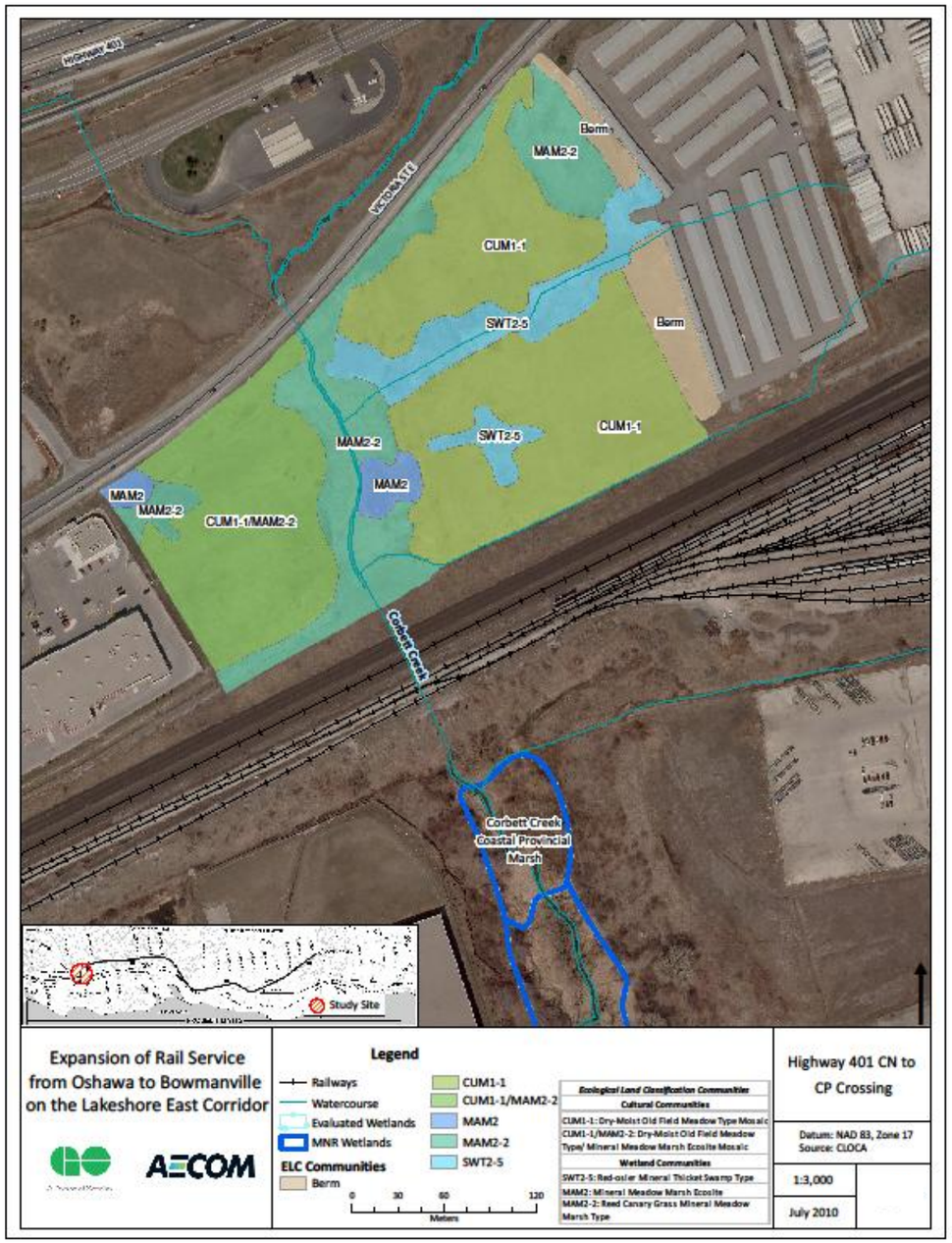


Figure 3-5 Ecological Land Classification (ELC) Communities within the CNR to CPR Crossing North Site

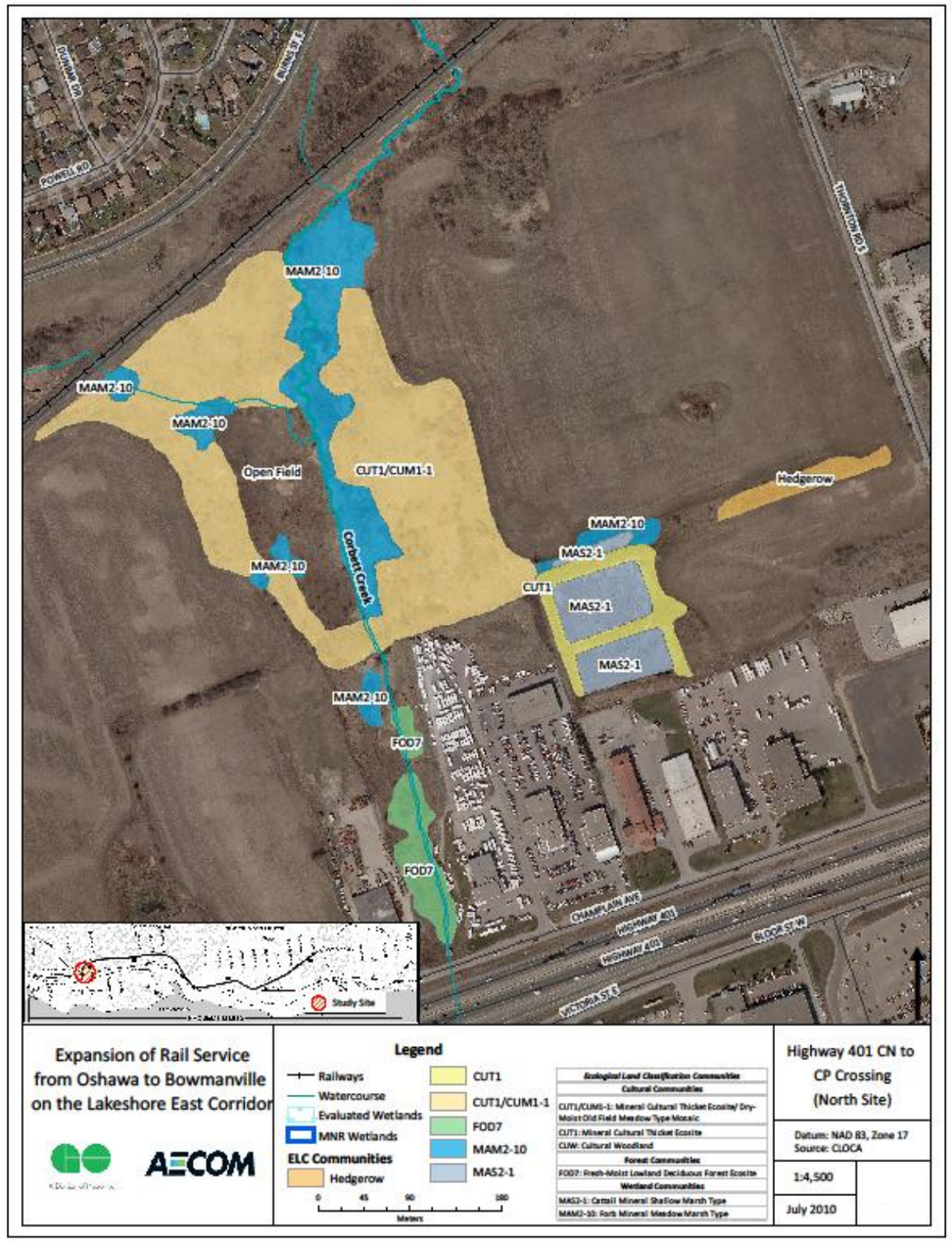


Figure 3-6 Ecological Land Classification (ELC) Communities within the Thornton Road GO Station Site

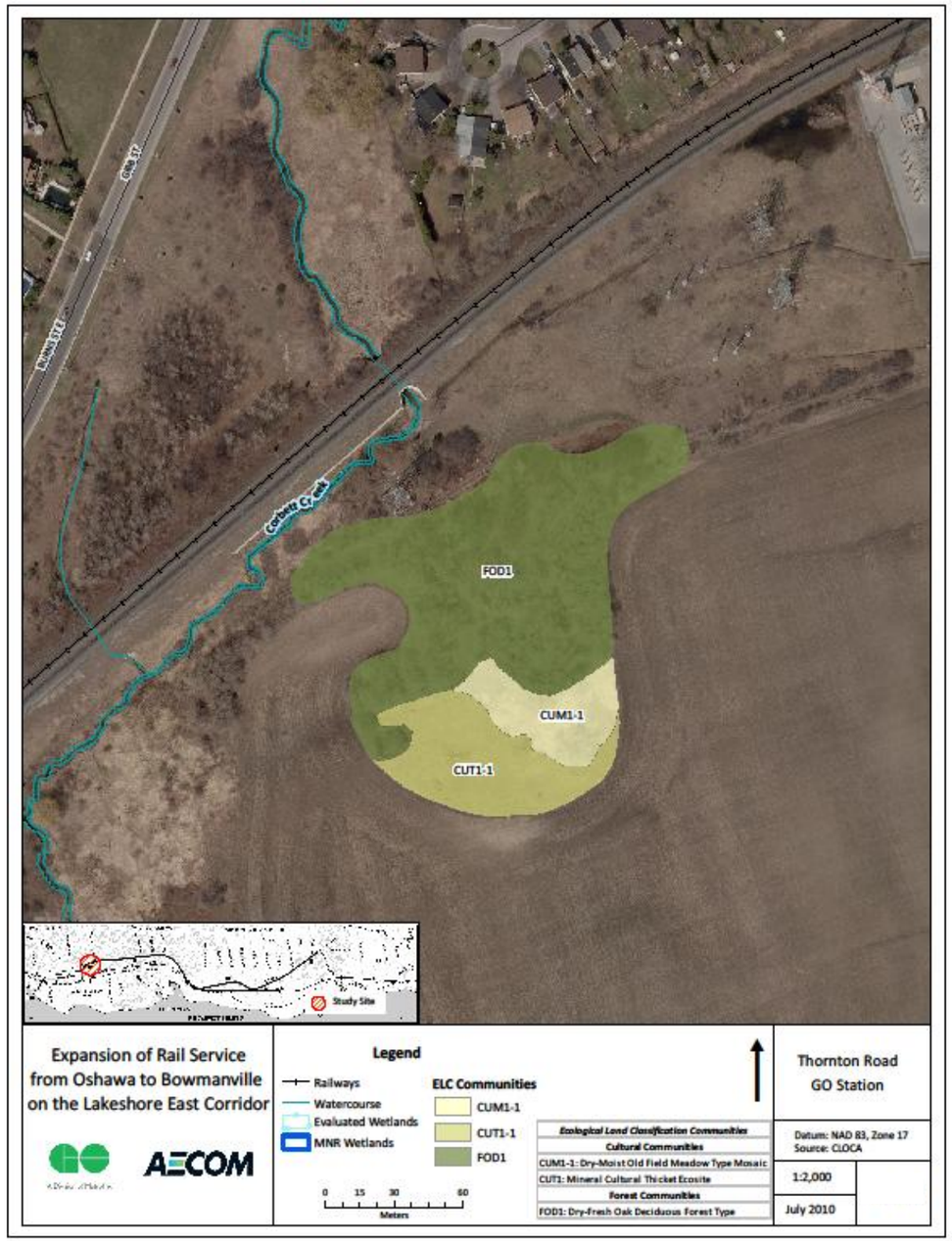


Figure 3-7 Ecological Land Classification (ELC) Communities within the Ritson Road GO Station Site

Figure 3-8 Ecological Land Classification (ELC) Communities within the Courtice Road GO Station Site

Figure 3-9 Ecological Land Classification (ELC) Communities within the Martin Road GO Station Site

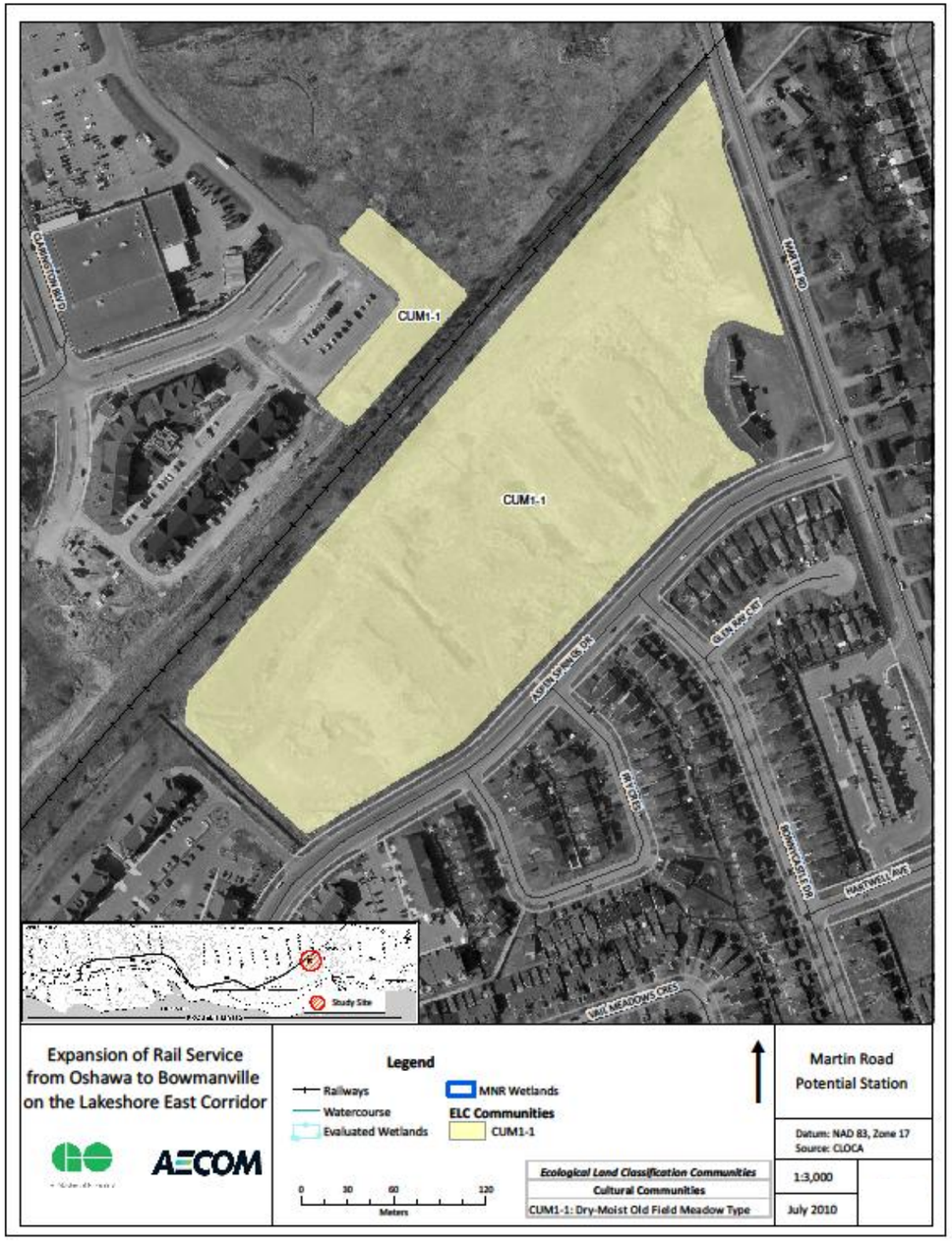


Figure 3-10 Ecological Land Classification (ELC) Communities within the Rundle Road Layover Facility Site

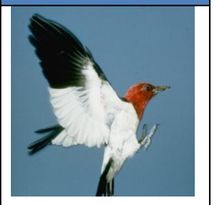
3.1.8 Species at Risk

A review of applicable background information sources was conducted to determine the potential presence of Species at Risk within and in proximity to the Project Limits. This entailed accessing and reviewing the following website registries to provide a framework for the field investigations:

- MNR Natural Heritage Information Centre (NHIC) database[10] for rare, threatened and endangered species
- MNR Biodiversity Explorer
- COSEWIC[11] database
- Environment Canada's Species at Risk Registry for species protected by federal legislation called the Species at Risk Act (SARA)
- Conservation Ontario 2010 Aquatic Species at Risk

According to the OBBA, three (3) avian species with habitat that is marginally suitable to suitable for breeding within or near the Project Limits are listed as Species at Risk. Of these three, two (2) are considered Special Concern by the Committee on the Status of Species at Risk in Ontario (COSSARO), and consist of the Red-headed Woodpecker (*Melanerpes erythrocephalus*), Common nighthawk (*Chordelies minor*), and Chimney swift (*Chaetura pelagic*) (see **Table 3.4**).

Table 3.4 Federally and Provincially Significant Bird Species within the Study Area

Species	Status		Habitat	Representative Photograph
	Federal (COSEWIC)	Provincial (COSSARO)		
Red-headed woodpecker *(Melanerpes erythrocephalus)*	Threatened	Special Concern	Oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, beaver ponds and barns.	
Common nighthawk *(Chordelies minor)*	Threatened	Special Concern	Habitat is varied and includes open habitats where the ground is devoid of vegetation, such as sand dunes, beaches, logged areas, burned-over areas, forest clearings, rocky outcrops, rock barrens, prairies, peatbogs and pastures.	
Chimney swift *(Chaetura pelagic)*	Threatened	Provincially Secure	Are aerial foragers, often concentrating near water where insects are abundant. Mainly associated with urban and rural areas where chimneys are available for nesting and roosting. Winter habitat extends from river-edge forest and edge of tropical lowland evergreen forest to farmland and suburban and central city zones.	

According to the CLOCA species database, a Red-headed Woodpecker was observed exhibiting breeding behaviour on the southeast corner of Forbes and Wentworth in Oshawa while fieldwork was being conducted for an ESA by JE Hanna Associates. There are also several other records of this bird at Thickson's Woods, Lakeview Park, Bonnie Brae Point, Pumphouse Marsh and Oshawa Second Marsh. Red-headed Woodpecker habitat preferences include open parkland, woodland edges, and sparsely treed fencerows, and especially riparian forest, provided large dead weathered trees or live trees with large dead branches are available to nest in. Their nesting habitat is available within the study area.

The Common Nighthawk is a ground-nesting aerial forager that is usually heard high over forests or cities. They prefer an interspersion of open rock barrens and forest cover, including open habitat like rock barrens, alvars, bogs, fens, and forest openings created by clearcuts and burns. In southern Ontario they have nearly disappeared from forested lands and are found at airports, gravel pits, grasslands, and agricultural fields, though it shuns areas of intensive farming. In cities, they nest on buildings with flat gravel roofs, and occasionally on railways and footpaths. This bird is predominantly crepuscular and nocturnal, and is extremely well camouflaged while incubating. Their nesting habitat is available within the study area.

The Chimney Swift is a recent addition to the federal Species at Risk list. Their population currently only breeds in eastern North America, and winters in South America from the upper Amazon River basin to Columbia, Peru and Ecuador. They traditionally nested in hollow trees, however they have also almost completely adapted to nesting in human structures like chimneys. The main threat to Chimney Swifts is the loss of roosting and breeding sites, namely due to the move to gas furnaces and changes to chimney construction; an overall decrease in insect populations caused by insecticides may also be a factor. Their nesting habitat is likely available within the study area.

There are 23 rare species listed in the MNR NHIC database for NTS Map Sheet 30 M/15, which geographically covers the Project Limits. However, further review (electronic geographic query) of the NHIC database indicates five (5) of the 23 species listed within NTS Map Sheet 30 M/15 have a mapped range within the Project Limits. These species are listed in **Table 3.5**.

[10] *The NHIC compiles, maintains and provides information on rare, threatened and endangered species and spaces in Ontario. This information is stored in a central repository containing a computerized database, map files and an information library, which are accessible for conservation applications, land use planning, park management, etc. The NHIC website makes this information available through the internet.*

[11] *COSEWIC is mandated to assess and designate wildlife species that are considered to be in danger of becoming extinct in Canada.*

Table 3.5 Rare Species Records Within and Adjacent to the Project Limits

Specie (Scientific Name)	Common Name	MNR Rank	COSEWIC	SARA	Date Last Observed
Lanius ludovicianus	Loggerhead Shrike	END	END	END	1957
Colinus virginianus	Northern Bobwhite	END	END	END	1885
Icteria virens	Yellow-breasted Chat	SC	SC	END	1967
Emydoidea blandingii	Blanding's Turtle	THR	THR	THR	1981
Potentilla supina ssp. Paradoxa	Bushy Cinquefoil				1980

As a follow up to the above noted NHIC website, the MNR recently introduced the Biodiversity Explorer, which is an online source for authoritative conservation information on over 15,000 plants and animals and over 450 ecological communities in Ontario (Biodiversity Explorer Website, 2009). Using the map interface element occurrence tool, a search of rare species was conducted through the selection of 1KM squares within the Project Limits. The results of the selected squares did not include any of the above noted species as identified on the MNR's NHIC website. However, one (1) taxon group was noted within the spatial boundary, known as Ants, Bees, Wasps and Sawflies, specifically a Bumble Bee *(Bombus affinis)*. No additional ranking information was available for this species.

The Conservation Ontario 2010 Aquatic Species at Risk website identifies aquatic Species at Risk by each Conservation Authority (CA) within Ontario. Interactive maps were downloaded and viewed to determine the potential presence of aquatic Species at Risk within the Project Limits. As noted within the Distribution of Fish Species at Risk Mapping, none of the above mentioned watercourse crossings are labelled as Species at Risk (Fisheries and Oceans Canada, 2009).

3.1.9 Wetland Habitat

Evaluated wetlands are those that have been assessed using the Ontario Wetland Evaluation System protocols developed by the MNR. Those that have a score of greater than 600 points or 250 points within the Special Features section are considered provincially significant. For those wetlands that do not reach these scores, they are considered non-provincially significant. However, these wetlands may be considered locally significant in some municipalities.

Fourteen evaluated wetland systems occur within four (4) kilometres of the study area. Of these, twelve are considered Provincially Significant Wetlands (PSW). These wetlands are for the most part located along or near stream systems of Lake Ontario and are considered riverine wetland systems. PSWs that may potentially be affected by the expansion of rail service include Whitby Harbour PSW Complex and Corbett Creek Coastal PSW Complex. These and the remaining wetland features near the study area are listed in **Table 3.6**.

Table 3.6 Evaluated Wetlands within and Adjacent to the Project Limits

Wetland Name	Significance	Size (ha)	Closest Distance to Rail (approximate)	Notes on Location
Whitby Harbour Wetland Complex	Provincial	22.8	Directly adjacent	Part of this wetland lies directly adjacent to the south side of the CNR, the opposing side of which is the planned location for the Whitby Maintenance Facility.
Whitby-Oshawa Iroquois Beach Wetland Complex			upstream	Whitby and the City of Oshawa, bordered by Thickson Road North to the west, Winchester Road to the north, Simcoe Street North to the east, and to approximately 1 km south of Taunton Road.
Corbett Creek Coastal Wetland Complex	Provincial	41.44	0.9 km downstream	Located at the mouth of Corbett Creek in the Town of Whitby and bordered by Thickson Road South to the west, Victoria Road East to the north, Boundary Road to the east, and Lake Ontario to the south.
Gold Point Coastal Wetland	Provincial	3.7	1.8 km downstream	Located at the mouth of GM Creek just east of Gold Point, Lake Ontario. It is in the City of Oshawa, bordered by Philip Murray Avenue to the north, Lake Ontario to the south, and is on the east side of Oshawa's Lakefront West Park and part of Lynde Shore Conservation Area.
Pumphouse Coastal Marsh Wetland Complex	Provincial	10.12	2.39 km downstream	Located in the City of Oshawa, bordered by Cedar Street to the west, Chaleur Avenue and Wecker Drive to the north, Ritson Road to the east, and Lake Ontario to the south.
Oshawa Creek Coastal Wetland Complex	Provincial	20.2	2.4 km downstream	Located at the Oshawa Creek mouth by Oshawa Harbour. The main wetlands (Wetlands No. 1-4) are in Oshawa Valleylands Conservation Area and Lakeview Park, bordered by Thomas Street to the west, Southlawn Avenue and Kawartha Avenue to the north, Simcoe Street to the east, and Valley Drive to the south. The remaining three wetlands are located in the Montgomery Creek tributary northeast of Oshawa Harbour by Harbour Road.
Oshawa Second Marsh	Provincial	160.73	400 m downstream	Located in the southeast end of Oshawa, nearly entirely within city limits. Bordered by Farewell Road to the west, Colonel Sam Drive to the north and east, and Lake Ontario to the south. It is a coastal wetland composed of swamp (29%) and marsh (71%).
McLaughlin Bay Wetland Complex	Provincial	73.6	200 m downstream	The marsh has sparse submerged vegetation and connection to Lake Ontario. It provides habitat structure supporting a native fish species community. Bordered by Highway 401 to the north, Darlington Provincial Park to the east, and Lake Ontario to the south.
Harmony-Farewell Iroquois Beach Wetland Complex	Provincial	685.7	3 km upstream	Consists of 70 wetlands located in the Municipality of Clarington and the eastern portion of the City of Oshawa, bordered by Harmony Road to the west, Conlin Road East/Concession Road 6 to the north, Green Road to the east, and Nash Road to the south.
Tooley Creek Coastal Marsh	Local	0.35	1.8 km downstream	Located at the mouth of Tooley Creek in the Municipality of Clarington and bordered by Darlington Provincial Park to the west, Hwy 401 to the north, Courtice Road to the east and Lake Ontario to the south.
Raby Head Wetland #1	Local	5.4	2.6 km downstream	Raby Head Wetland #1 is a coastal wetland composed of 35% swamp and 65% marsh.
Maple Grove	Provincial	149.1	2 km upstream	Consists of 17 wetlands situated in the Municipality

Wetland Name	Significance	Size (ha)	Closest Distance to Rail (approximate)	Notes on Location
Wetland Complex				of Clarington around the hamlet of Maple Grove. It is bordered by Hancock Road to the west, just past Nash Road to the north, just past Green Road to the east, and King Street West (Highway 2) to the south,.
Westside Beach Marsh	Provincial	44.7	2.5 km downstream	Westside Beach Marsh is a coastal wetland, composed of two wetland types (6% swamp, 94% marsh). The northern area of the wetland is being quarried for limestone.
Bowmanville Coastal Wetland Complex	Provincial	50.92	2.37 km downstream	Formerly called Port Darlington Marsh, consisting of nine wetlands. It is located at the mouth of Bowmanville Creek in the Town of Bowmanville. Bordered by West Beach Road to the west, highway 401 to the north, Port Darlington Road to the east, and Lake Ontario to the south.

**AECOM 2009, 407 East Environmental Assessment and Land Information Ontario Database. Correspondence with CLOCA in 2009.*

***Natural Heritage Information Centre (NHIC) online database (2009).*

****Land Information Ontario Database (2009) and Google Earth.*

There are a number of unevaluated wetlands of various sizes within and adjacent to the study area that has not been evaluated by the MNR. Those that are identified within a given distance of a preferred site should be further examined at the detail design phase. Additional information received by the MNR has delineated a portion of those lands adjacent to Corbett Creek immediately south of Highway 401 as a Significant Ecological Area. Such areas are classified as unevaluated wetlands that warrant special consideration by the MNR, excluding Areas of Natural and Scientific Interest (ANSI), parks, and Environmentally Sensitive Areas (ESA).

3.1.10 Designated Natural Heritage Features

3.1.10.1 Environmentally Sensitive Areas (ESAs)

An Environmentally Sensitive Area (ESA) is a natural area identified by a Conservation Authority (CA) or municipality as an area that fulfills certain criteria for sensitivity or ecological significance. As noted under **Section 3.1.9**, there is one (1) PSW known as the Whitby Harbour Wetland Complex, which is located on the south side of the CNR line, immediately south of the ERMF site. In 1977, CLOCA undertook an environmental sensitivity mapping study to identify areas of sensitivity within its jurisdiction (Gartner Lee, 1978). To this end, a number of the above mentioned watercourse crossings were deemed environmentally sensitive:

Pringle Creek Valley – An unforested stream valley that holds little significance to fisheries and wildlife factors. However, it serves as an important function of surface water drainage and possesses inherent biological properties of local drainage. The valley exhibits a low to moderate sensitivity level.

Whitby Harbour ESA – Whitby Harbour is located at the mouth of Pringle Creek. The terrain is characterized by wetlands surrounded by high water table areas. Although the harbour provides seasonal shelter to migrating birds, it is not regarded as a significant wildlife area. This ESA exhibits a moderate sensitivity level.

Corbett Creek Valley – A valley bottom terrain unit that is subject to occasional flooding and conveys drainage from the modified till plain between Whitby and Oshawa. The creek valley exhibits a moderately low sensitivity.

Oshawa-Goodman Creek Valleys – Draining through a valley bottom physical setting, this reach of Oshawa Creek and the entire Goodman Creek tributary is thought to exhibit moderately low sensitivity.

Harmony Creek Valley – Serves the major function of surface water drainage through East Oshawa and from the Lake Iroquois Beach. It is noted not to hold significance to fisheries, wildlife or forest and thus has a moderately low sensitivity.

Farewell Creek Valley to Beach – As a result of significant forest, wildlife and fisheries, this area holds a high environmental sensitivity. In addition, review of Schedule D – Environmental Management of the City of Oshawa Official Plan indicates that Farewell Creek within and beyond the CPR line ROW is delineated as an ESA. These lands refer to natural landscapes containing areas of inherent biological or physical sensitivity, such as aquifer recharges, headwaters, unique plants, wildlife, breeding or over-wintering habitats, vital ecological functions, rare or endangered species, or other combinations of habitat and landform which could be essential for scientific research or conservation education (City of Oshawa, 2008).

Robinson Creek Valley – Acting only as a conveyor of local surface drainage, this stream exhibits a low to moderate sensitivity.

Tooley Creek Valley – As with Robinson Creek, this stream conveys surface drainage and has a moderately low sensitivity.

Darlington Creek – This stream conveys surface drainage to Lake Ontario through Bowmanville Third Marsh. The eastern branch of this stream is fed by springs from the western flank of a drumlin however no significant environmental features exist so sensitivity is moderately low (Gartner Lee, 1978).

3.1.10.2 Areas of Natural and Scientific Interest (ANSIs)

ANSIs are areas of land or water that represent significant geological (earth science) and/or biological (life science) features, and are known to have a high value for conservation, scientific study, and education. Nine (9) ANSI's occur within three (3) kilometres of the study area and are listed in **Table 3.7**.

Table 3.7 ANSIs within the Vicinity of the Project Limits

ANSI Name	Type	Size (ha)	Closest Distance to Rail (approximate)	Notes on Location/Reason for Significance
Corbett Creek Coastal Marsh	Life Science	27.63	1.5 km downstream	This Life Science ANSI is also a PSW.
Pumphouse Coastal Marsh	Life Science	7.1	3 km downstream	This Life Science ANSI is also a PSW.
Oshawa Second Marsh	Life Science	133.5	400 m downstream	This Life Science ANSI is also a PSW.
Bowmanville Creek	Life Science	121.3	1.5 km upstream	This 125 ha Life Science ANSI is a narrow forested river valley corridor along Bowmanville Creek stretching from south of Hampton to 2 km north of Bowmanville. It contains a range of upland, valley wall, lowlands and floodplain forests.
Bowmanville Valley/Quarry	Earth Science	2.8	1.4 km downstream	This Earth Science ANSI is 2.7 ha in size and has 32 m of Middle Ordovician Lindsay Formation and 3 m of Late Ordovician lower-member Whitby Formation. The contact between these units is marked by 1 m of black fissile shale and brown argillite. This site is also noted for its well preserved fossil remains.
Bowmanville Coastal Marsh and Fen	Life Science	32.7	2.37 km downstream	This Life Science ANSI is within the Bowmanville Coastal Wetland Complex (see Wetlands above)
Stephen's Gulch	Earth Science	46.3	3 km upstream	This 47 ha Earth Science ANSI is encompassed and protected by Stephen's Gulch Conservation Area. It is a Late Wisconsin-period Lake Iroquois spit that grew across the mouths of both Soper and Wilmot Creeks
Soper Valley	Life Science	132	3 km upstream	Much of this Life Science ANSI lies within Stephen's Gulch Conservation Area. Its forests and swamps help maintain both water quantity (through seeps and springs) and water temperature along this section of Soper Creek.
West Clarington – Iroquois Beach**	Life Science ANSI	-	North of study area	It is a landform with extensive forested areas and wildlife habitat, providing an east-west natural corridor across the Municipality. This landform is also valued for its groundwater recharge and discharge functions, its landscape features and its aggregate resources, and is a significant provider of cold water to the area streams.

**AECOM 2009, 407 East Environmental Assessment and Land Information Ontario Database. Correspondence with CLOCA in 2009.*

***Land Information Ontario Database (2009) and Google Earth.*

****Bowmanville/Soper Creek Aquatic Resource Management Plan, Figure 2d.*

3.1.10.3 Conservation Areas

Conservation areas within the vicinity of the Project Limits are owned and managed by CLOCA or the municipality. Some of these serve various recreational functions, while others have limited access in order to protect environmentally sensitive features. The conservation areas relevant to the study area are listed in **Table 3.8**.

Table 3.8 Conservation Areas within the Vicinity of the Project Limits

Conservation Area Name*	Size (ha)	Notes on Location/Reason for Significance
Oshawa Valleylands Conservation Area	54.8	This area is located along the portion of Oshawa Creek between Bloor Street and the Oshawa Harbour. The Conservation Area protects the ecological attributes of this reach.
Bowmanville Valley Conservation Area	24.6	This area occupies the banks of the Bowmanville Creek and protects the ecological attributes of this reach
Bowmanville Harbour Conservation Area	28.6	This area includes portions of the Port Darlington and Westside Beach Marshes.
Stephen's Gulch Conservation Area	105.7	This area includes a portion of the provincially significant Soper Valley ANSI and borders a significant section of Soper Creek. It protects a large area of deciduous forest and coniferous forest swamp.
Thurne Park Valley Conservation Area	17.2	This area is located along Wilmot Creek, just south of 4th Concession.

**Information obtained through www.ontarioconservationareas.ca*

3.1.10.4 Municipal Parks

The City of Oshawa purchased Cedar Valley and Harmony Valley Conservation Areas from CLOCA in 2004, now named Cedar Valley Park and Harmony Valley Park respectively. Master Plans were prepared for each park in order to define a vision and management plan for the areas. The primary goal for Cedar Valley Park is to "preserve existing natural systems and ecology", while the main focus for Harmony Valley Park is to "preserve significant natural heritage systems, and provide varied recreation opportunities" (Marshall Macklin Monaghan, 2006, May 8a; 2006, May 8b). The significance of each park is outlined in **Table 3.9**.

Table 3.9 Significant Municipal Parks within the Vicinity of the Project Limits

Municipal Park Name	Size (ha)	Notes on Location/Reason for Significance
Cedar Valley Park*	41	This park occupies land along the east and west branches of Oshawa Creek, where they converge to form the main branch of Oshawa Creek. There are very large floodplain areas along the Creek, and part of the historic Lake Iroquois shoreline forms some of the valley slopes.
Harmony Valley Park**	28	This park includes a section of a Harmony Creek tributary, as well as portions of the provincially significant Harmony-Farewell Iroquois Beach Wetland Complex. Part of the historic Lake Iroquois shoreline runs along the north edge of the park.

**Information obtained through the Cedar Valley Park Master Plan (Marshall Macklin Monaghan, 2006, May 8a)*

***Information obtained through the Harmony Valley Park Master Plan (Marshall Macklin Monaghan, 2006, May 8b)*

3.1.11 Air Quality

An air quality assessment was completed to predict the potential air quality impacts of the GO Transit expansion in Durham Region. The objective of the assessment was to provide a comparison of the air quality impacts resulting from the proposed expansion to an established future baseline and evaluate how the proposed expansion may potentially

affect air quality in the study area. The emissions of potential concern are nitrogen oxides (NO_x), carbon monoxide (CO), sulphur dioxide (SO_2) and particulate matter (PM). Select Volatile Organic Compound (VOC) emissions were also assessed and include acetaldehyde, acrolein, benzene, 1,3-butadiene, and formaldehyde.

A general estimate of the baseline ambient air quality was made using publicly available historical air quality data from ambient air quality monitoring stations within Ontario. As part of the methodology, hourly and annual ambient concentrations of air quality emissions ($PM_{2.5}$, NO_x, SO_2 and CO) were obtained from the Toronto West monitoring station as this station portrays considerably higher ambient results due to its proximity to high density traffic corridors. Ambient air monitoring for VOCs is less common and the available monitoring stations were not close to the study area. Thus, the MOE's Hamilton Downtown monitoring station was chosen for ambient background Benzene and 1,3-Butadiene concentrations with additional VOC data obtained from the Windsor West monitoring station. It is noted that the monitoring stations at which these values were obtained are located in areas that are more urban and industrial than the location of many of the proposed GO stations, and may have higher contaminant concentrations than the area of interest.

In addition to the above, future traffic maps, plans and reports were reviewed to build the road networks and links around the proposed GO facilities. Sensitive receptor locations were evaluated and extracted from secondary sources and field investigations. Using the traffic information, representative emissions rates were developed for vehicular flow using MOBILE 6.2. The collected data and generated vehicular emission rates were used in an air dispersion model known as CAL3QHCR. The main inputs required for the model include, a base map of road network, the location of receptors and road segments, vehicle exhaust emission factors (i.e., g/VmT) for the road segments, the overall peak hourly traffic flow in each area, traffic signal timing used to calculate idle times and length of traffic queuing; and one year (2000) of meteorological data.

The CAL3QHCR model was run using urban settings as outlined in the US EPA document Guideline on Air Quality Models. The gaseous contaminants such as CO, SO_2, NO_x and VOCs were modelled using the CO option, while the particulate contaminants used the PM option. Presented results are based on a 1 hr, 8 hr, 24 hr and annual averaging time to facilitate comparison to the applicable guidelines. The maximum concentration predicted by CAL3QHCR is considered conservative as the maximum emission factors and peak traffic flow are used for all hours of the one-year modeling period when in reality the actual emission factors and traffic flow are frequently less (not peak). Further information pertaining to the air quality assessment, including approach, methodology, data collection, analysis, and an assessment of results is included in **Appendix E** of this report.

3.1.12 Contaminated Properties

Given that the Project Limits exhibit a long history of CNR and CPR freight services, sources of potential contamination including possible spills and/or leaks of oils, metals, arsenic, solvents and other petroleum product (i.e., fuels, lubricants, etc.) may existing from moving freight and/or rail equipment. Review of Schedule C – Environmental Management within the Town of Whitby's Official Plan indicates a former waste disposal site immediately south of the ERMF site on the south side of the CNR line. In addition, review of Schedule D – Environmental Management within the City of Oshawa's Official Plan indicates a Waste Disposal Assessment Area approximately 100 m south of the CPR line on the east side of Ritson Road.

Review of the Ministry of Environment and Energy Waste Disposal Site Inventory (1991) indicates the presence of a closed waste disposal site location (Site No. X 7102) in the City of Oshawa on the south side of Gibb Street, immediately east of Nassau Street and north of the CPR ROW. This waste disposal site was closed in 1921 and was classified as an A5 site, which included municipal/domestic waste in an urban setting (MOEE, 1991).

3.2 Socio Economic Environment

3.2.1 Provincial Planning Policies

Since 2001, the Province of Ontario has approved a series of initiatives, Statutes and Plans that have profoundly changed the way planning and development is to occur within Ontario. As such, the Project Limits are situated within a number of provincial planning policy areas, as described below.

3.2.1.1 Ontario Planning Act

The *Ontario Planning Act* (2006) sets out the ground rules for land use planning in Ontario and describes how land uses may be controlled, and who may control them. Pursuant to the *Planning Act*, the Province of Ontario is the primary planning authority in Ontario. The *Planning Act* enables the Province to delegate some of its planning authority to the upper-tier municipalities (e.g., counties and regional/district municipalities, as well as planning boards) while retaining control through the approval process. Municipalities must conform to approved policies of the Provincial government and its agencies.

Provincial ministries, municipal councils, planners and other stakeholders implement the Act when such actions include:

- Preparing Official Plans and planning policies that guide future development considering provincial interests, such as protecting and managing natural resources;
- Regulating and controlling land uses through zoning by-laws and minor variances; and
- Dividing land into separate lots for sale or development through a plan of subdivision of a land severance.

3.2.1.2 Provincial Policy Statement

The Provincial Policy Statement (PPS) is the complementary policy document to the *Planning Act*. Issued under the authority of Section 3 of the *Planning Act*, the PPS provides direction on matters of provincial interest related to land use planning and development, and promotes the provincial "policy-led" planning system that recognizes and addresses the complex inter-relationship among environmental, economic and social factors in land use planning (Ministry of Municipal Affairs and Housing (MMAH), 2005).

The *Planning Act* requires that the PPS be reviewed periodically to make sure its policies are still effective. The new PPS took effect on March 1, 2005, and provides for enhanced protection of the environment by identifying the significance of the natural heritage system and water resources, including natural hazards and water quality, air quality and energy use. The new policies also provide for intensifications and brownfields development to ensure the maximum use of sewer, water and energy systems, roads and transit. The new PPS also provides for more transit-friendly land-use patterns using intensification and more compact, higher density development, as a means of bringing more people closer to the transit routes (MMAH, 2005).

3.2.1.3 Growth Plan for the Greater Golden Horseshoe

In recognition of the Greater Golden Horseshoe's (GGH)[12] distinction as one of the fastest growing regions in North America, Bill 136, the Places to Grow Act, 2005 received Royal Assent on June 13, 2005 (Ministry of Infrastructure (MPIR), 2006). The Act provides the legal framework necessary to implement the Government of Ontario's vision for building stronger, prosperous communities by better managing growth in the GGH to the year 2031. The Act enables the government to plan for population growth, economic expansion and the protection of the environment, agricultural lands and other valuable resources in a coordinated and strategic way.

On June 16, 2006, the Province of Ontario released its Growth Plan for the Greater Golden Horseshoe. By 2031, the GGH's population will grow by 3.7 million people, which represents an approximately 47.5% increase from the area's existing (2001) population of 7,790,000. During this same period, employment within the GGH will continue to grow from 3,810,000 to 5,560,000, representing an approximately 46 percent increase. As one of the fastest growing areas in Canada, the purpose of the Plan is to "lay the course for future economic prosperity in the Greater Golden Horseshoe".

The Growth Plan envisages increasing intensification of the existing built-up area, with a focus on "urban growth centres, intensification corridors, major transit station areas, brownfield sites, and greyfields". The Greater Toronto Area-Hamilton (GTAH) is one of the fastest growing regions in North America, as it is the destination of choice for many people looking to relocate from other parts of Canada and around the world because of its high quality of life and economic opportunities.

The Growth Plan designates the Regional Municipality of Durham as an 'Inner Ring'. Moreover, Downtown Oshawa is mapped within Schedule 4 of the Plan as an Urban Growth Centre, which by 2031 or earlier, will achieve a minimum growth density target of 200 residents and jobs combined per hectare.

Review of Schedule 3 – Distribution of Population & Employment for the Greater Golden Horseshoe 2001-2031 identifies Durham Region as reaching a population of 660,000 by 2011, 810,000 by 2021 and 960,000 by 2031. Similarly, employment within the Region is projected at 260,000 by 2011, 310,000 by 2021 and 350,000 by 2031.

[12] *The GGH includes the cities of Toronto, Hamilton and Kawartha Lakes, the regional municipalities of Halton, Peel, York, Durham, Waterloo and Niagara and the counties of Haldimand, Brant, Wellington, Dufferin, Simcoe, Northumberland and Peterborough (MPIR, 2006).*

3.2.2 Regional Setting, Economy and Population

The Project Limits are situated within the Town of Whitby, City of Oshawa, and the Municipality of Clarington. These lower-tier municipalities form part of the eight (8) area municipalities within the Regional Municipality of Durham, as illustrated in **Figure 3-11**.

Durham Region is situated in the highly developed and populated economic centre of Ontario, known as the Golden Horseshoe that stretches from Oshawa to Niagara Falls. The Region is located immediately east of the City of Toronto within the Greater Toronto Area (GTA) and is comprised of an area approximately 2,590 km² (Durham Region Website, 2009). Termed an 'emerging power' within the GTA, Durham Region focuses its economic growth on several key sectors including advanced Manufacturing, agri-business, energy, film, and tourism.

The Town of Whitby is ranked as the 10th fastest growing community in Canada and is recognized as Durham's Business Centre. It includes a wide range of Canadian and international companies which cater to manufacturing, information technology, telecommunications, packaging, energy, automotive, steel, plastics and government services. In addition, the City of Oshawa is home to many sectors including automotive, energy, information technology and health sectors. It is noted that the city is moving away from a manufacturing based community to a more diverse economic base.

The Municipality of Clarington offers farming communities and hamlets including Courtice, Bowmanville, Newcastle and Orono. One of the Region's largest employers, Ontario Power Generation's Darlington Nuclear Generating Station, is located in Clarington, and produces enough electricity to serve a city of two million people. Moreover, the new Courtice Water Pollution Control Plant has been constructed (Durham Annual Report, 2008).

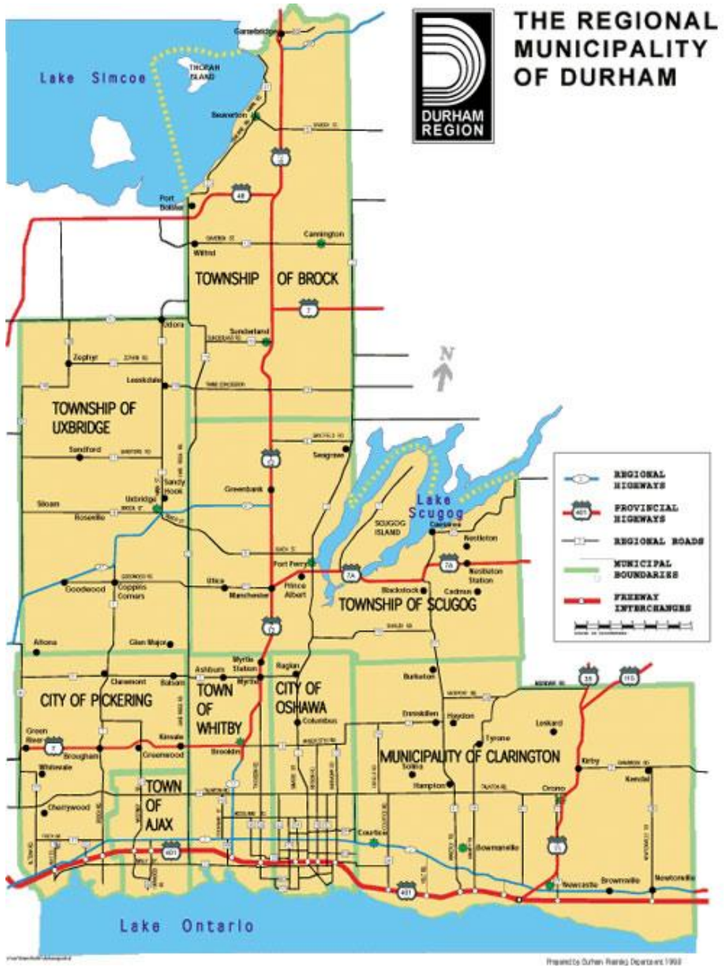
A report compiled by the Durham Region Planning Department estimates that the population of the Region was 531,000 in 2001. Review of the 2008 Annual Report for Durham Region indicates that the population estimate within the Region for 2008 was estimated at 605,730 (as of May 31, 2008) (Durham Annual Report, 2008). **Table 3.10** includes a list of 2008 population statistics within the lower-tier municipalities of the Region, as well as their respective areas.

Table 3.10 2008 Population Statistics within Durham Region

Municipality	2008 Population (as of May 31, 2008)	Area of Municipality
City of Pickering	91,230	232 km²
Township of Scugog	22,815	478 km²
Town of Ajax	103,855	68 km²
Town of Whitby	120,055	147 km²
Township of Brock	12,530	426 km²
City of Oshawa	150,365	147 km²
Township of Uxbridge	21,010	424 km²
Municipality of Clarington	83,870	613 km²
Region of Durham	605,730	2,535 km²

(Durham Region Annual Report, 2008)

Figure 3-11 Durham Region and Area Municipalities



(Durham Region Website, 2009)

3.2.3 Municipal Existing and Future Land Uses

This section will discuss the existing land uses within the Project Limits as well as future land use planning designations as determined by the municipalities with jurisdiction in reference to their approved Official Plan and Secondary Planning documents. The existing land uses within the Project Limits are primarily commercial/industrial, urban/residential, as well as rural/agricultural with some recreational and open space land uses. The Project Limits within the Town of Whitby include open space agricultural as well as commercial/industrial establishments.

Within the City of Oshawa, the existing land uses primarily include urban residential establishments with sporadic open space recreational as well as commercial land uses (i.e., shopping centres). Those lands within the Municipality of Clarington are comprised of a rural agricultural setting with some light commercial/industrial uses east of Prestonvale Road. There are few sporadic residential dwellings throughout this portion of Clarington. However, within the hamlet of Bowmanville, are single unit two-storey detached residential units, at the eastern limits of study.

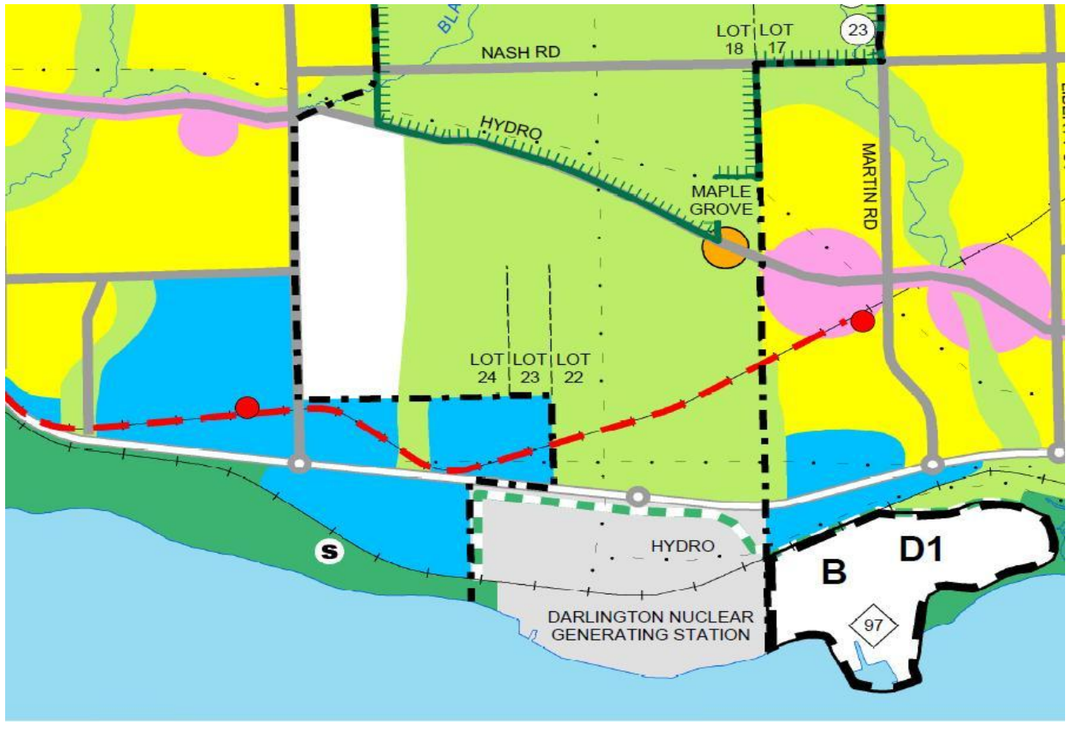
Regional Municipality of Durham Official Plan

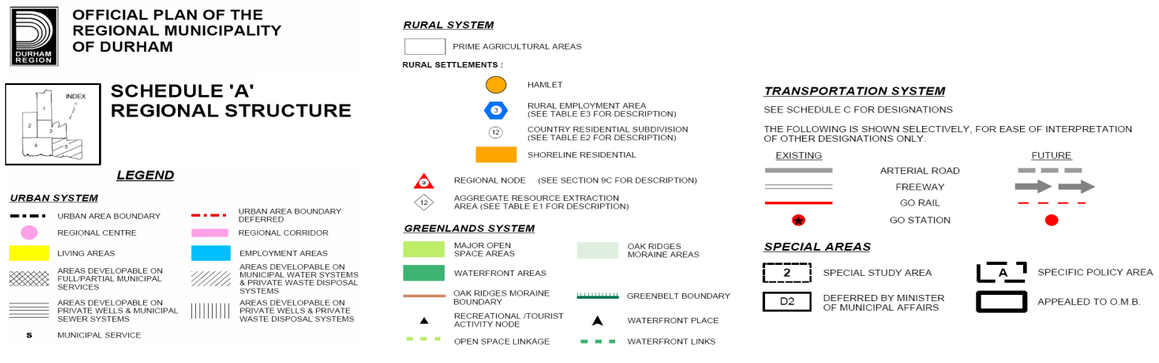
Pursuant to the *Planning Act*, the Regional Municipality of Durham Official Plan was adopted by Regional Council on July 14, 1976, and was subsequently approved by the Minister of Housing on March 17, 1978. The original approved Official Plan was later replaced by the current Official Plan on November 24, 1993, after a lengthy review and consultation process, which involved deferring several of the former Official Plan sections (Durham Region Official Plan, 2008). As noted within the current 2008 Official Plan Consolidation, the purpose of this Plan is:

- To provide policies that promote an improved quality of life and secure the health, safety, convenience and well-being of the present and future residents of the Region;
- To establish the future development pattern of the Region and articulate goals, policies and implementation mechanisms to achieve such a development pattern;
- To provide guidelines for Regional Council and Councils of the area municipalities in the preparation of future amendments to this Plan, area municipal official plans, zoning by-laws and other municipal actions and programs; and
- To provide information for the Federal and Provincial Governments to be considered in the preparation of plans and programs that may affect the Region (Durham Region Official Plan, 2008).

As illustrated in **Figure 3-12**, Schedule 'A' of the Regional Structure identifies several proposed land uses within the Project Limits and immediately adjacent to the CNR and CPR line. These land uses reflect an urban as well as a rural system, and includes delineations of environmental areas. Moreover, it includes a proposed transportation system with existing and future GO Stations as per previously completed EAs.

Figure 3-12.Durham Region Official Plan Land Use Designations





Town of Whitby Official Plan

Pursuant to the *Planning Act*, Council adopted the Town of Whitby Official Plan on September 28, 1994, through By-law No. 3569-94. The Official Plan was subsequently approved by Council of the Regional Municipality of Durham on December 6, 1995, with some modifications, deferrals for further consideration and referrals to the Ontario Municipal Board (OMB) (Whitby Official Plan, 2005). As noted therein, the general purpose of the Official Plan is:

- To provide policies that support quality of life and secure the health, safety, convenience and welfare for the present and future inhabitants of the Municipality;
- To set out future form of the Municipality, establishing the general land use and transportation pattern, and to articulate a policy framework by which this form can be achieved and under which it can best function in a regional environment;
- To respond to existing and future Regional and Provincial policies, statements and guidelines which affect the Municipality and appropriately incorporate them in the Official Plan;
- To provide sufficient residential land to satisfy housing needs in terms of housing type, tenure, density and cost, taking into account household size and income of new households in accordance with the Municipality's Municipal Housing Statement and Land Use Review Study;
- To provide policies which ensure the provision of affordable housing in Whitby;
- To provide policies to ensure an efficient development approvals process and other administrative requirements; and
- To provide policies and directives for the overall management of growth, maintenance of the existing community and sustaining the environment (Town of Whitby Official Plan, 2005).

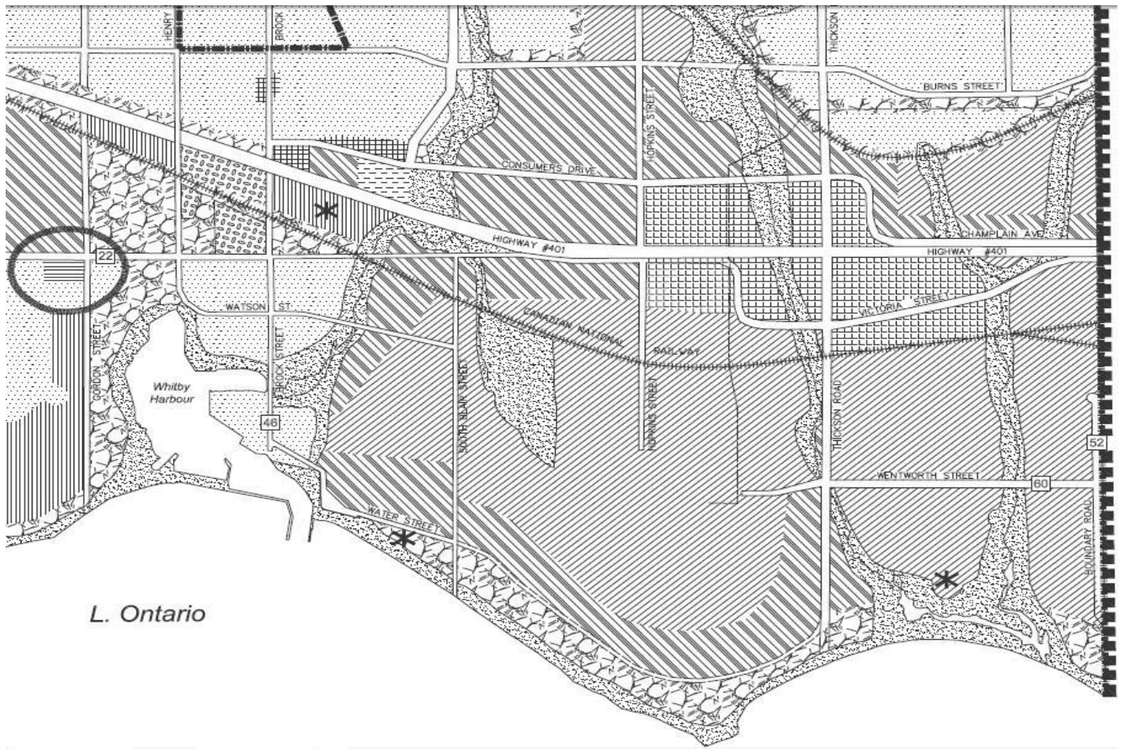
As illustrated in **Figure 3-13**, Schedule 'A' of the Official Plan provides a list of proposed land uses within the Town's jurisdictional boundaries.

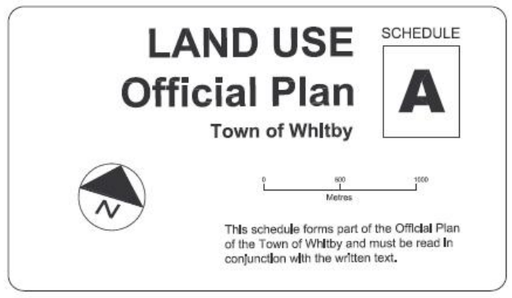
City of Oshawa Official Plan

The City of Oshawa is geographically located between the Town of Whitby to the west and the Municipality of Clarington to the east. The current Official Plan was approved by the Ministry of Municipal Affairs and Housing on February 12, 1987, and sets out policies governing land use designations including residential, commercial, industrial, agricultural, open space and recreation.

As illustrated in **Figure 3-14**, Schedule 'A' of the Official Plan provides a list of proposed land uses within the City of Oshawa's jurisdictional boundaries.

Figure 3-13 Town of Whitby Official Plan Land Use Designations





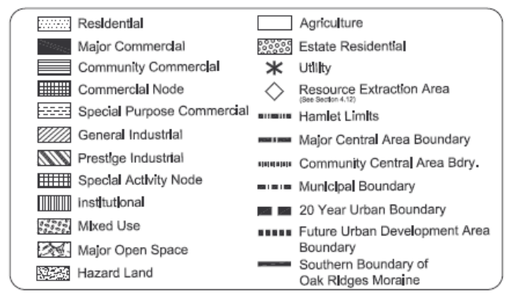
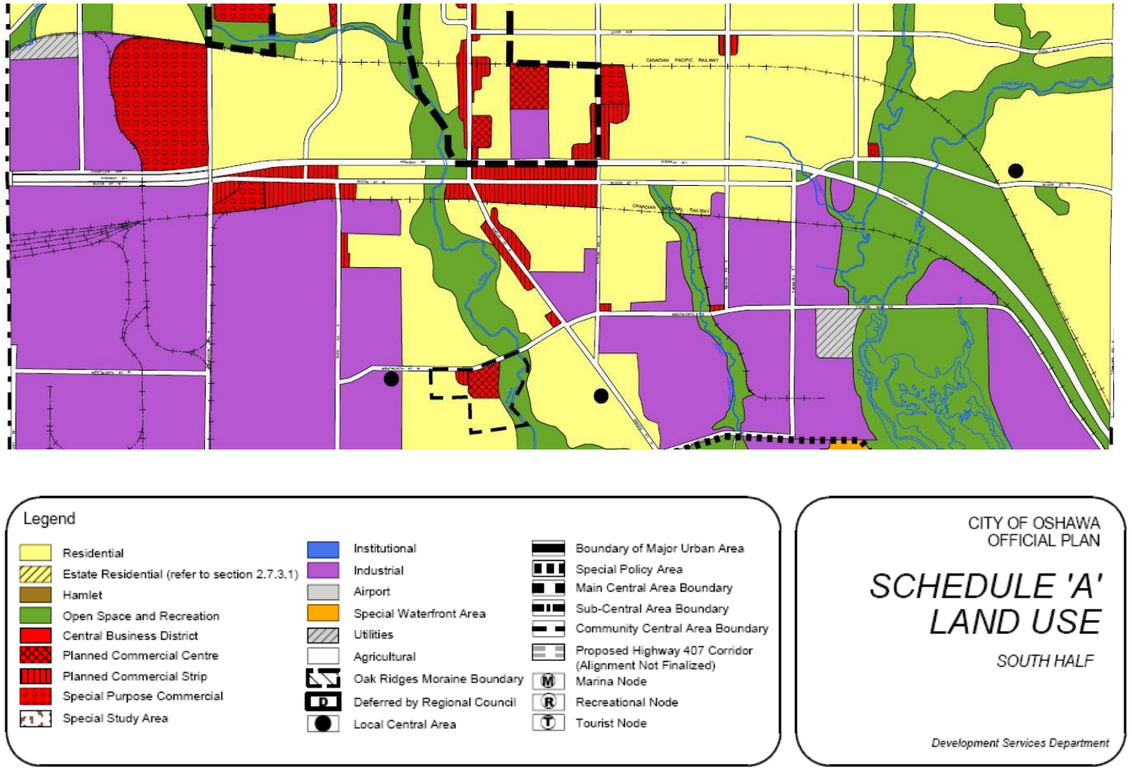


Figure 3-14 City of Oshawa Official Plan Land Use Designations



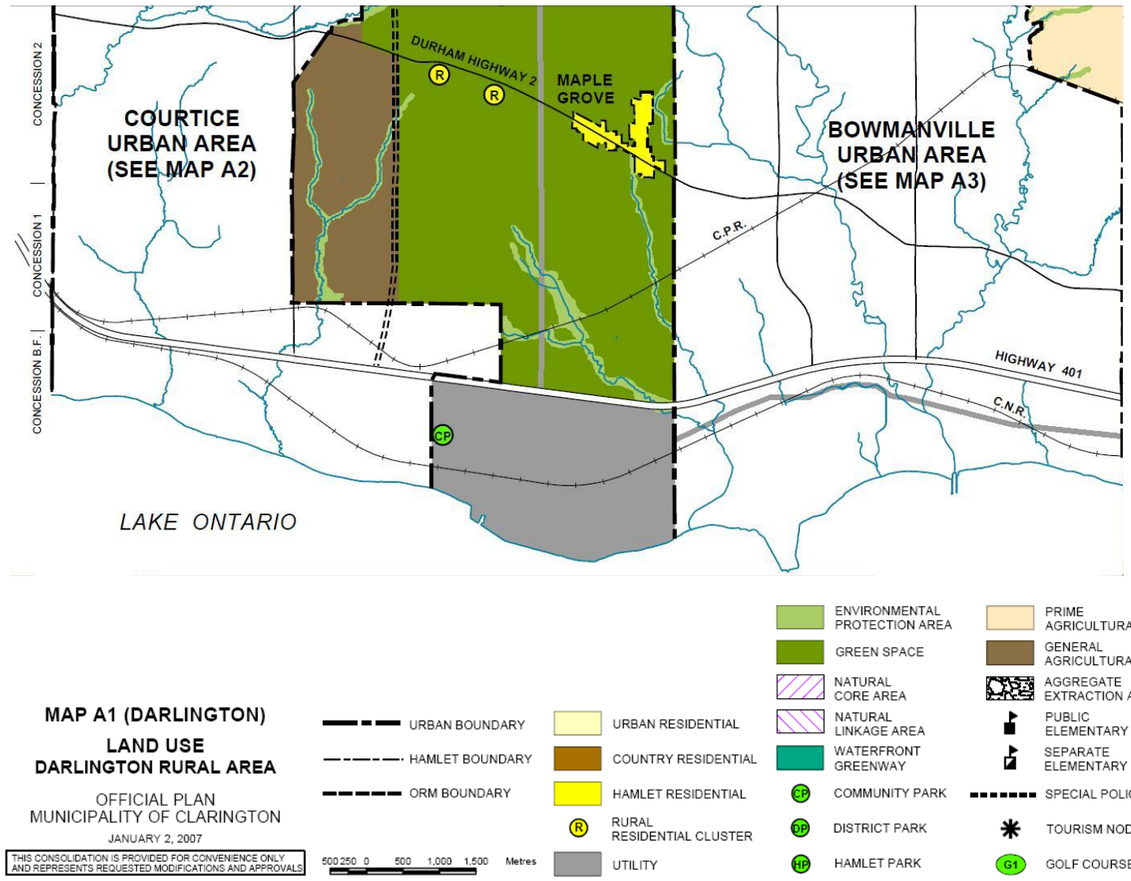
Municipality of Clarington Official Plan

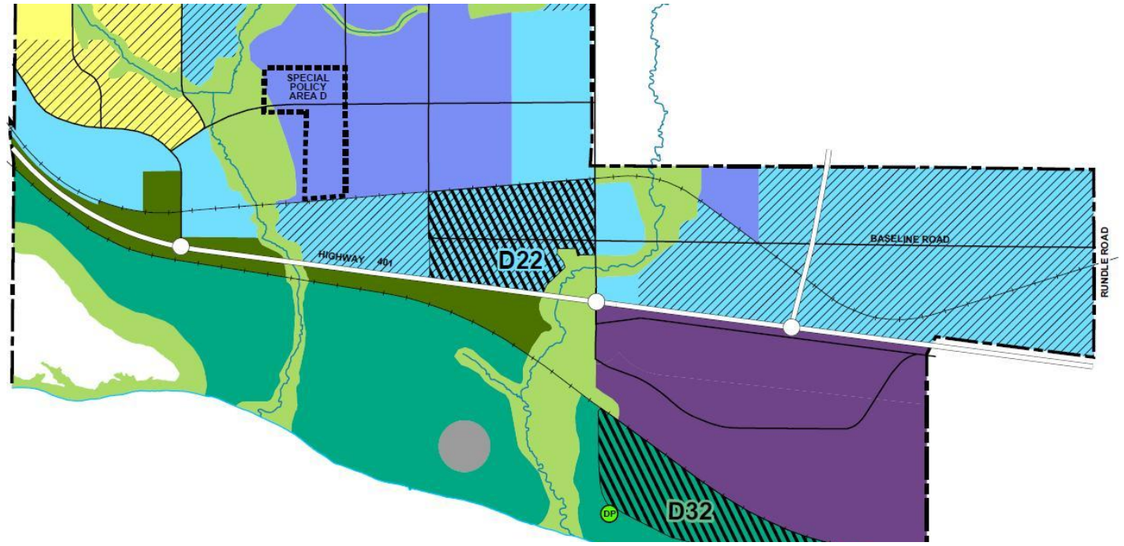
Preparation of the Municipality of Clarington Official Plan was initiated in February 1992. Through a five (5) phase process, involving several background papers, discussions papers and an extensive review, Council provided direction to Clarington staff to finalize the Official Plan in September 1995. As noted therein, the Official Plan was developed in accordance with the Planning Act and a Comprehensive Set of Provincial Policy Statements to create a framework for future growth and development within the Municipality to the year 2016. As such, the main purposes of the Plan are:

- To foster the economic, environmental, cultural, physical and social well-being of the residents in Clarington;
- To guide the future form of physical development of the Municipality with respect to land use and transportation;
- To assist in the prevention and resolution of land use conflicts;
- To provide a framework for identifying and evaluating land use opportunities;
- To provide the basis for other Municipal plans, public works and actions; and
- To inform the public, business and other levels of government of Council's intentions for the physical development of the Municipality (Municipality of Clarington Official Plan, 2007).

As illustrated in **Figure 3-15**, Map A1 – Map A3 of the Official Plan provides a list of proposed land uses within the Municipality of Clarington's jurisdictional boundaries.

Figure 3-15 Municipality of Clarington Official Plan Land Use Designations





MAP A2
LAND USE
COURTICE URBAN AREA

OFFICIAL PLAN
MUNICIPALITY OF CLARINGTON

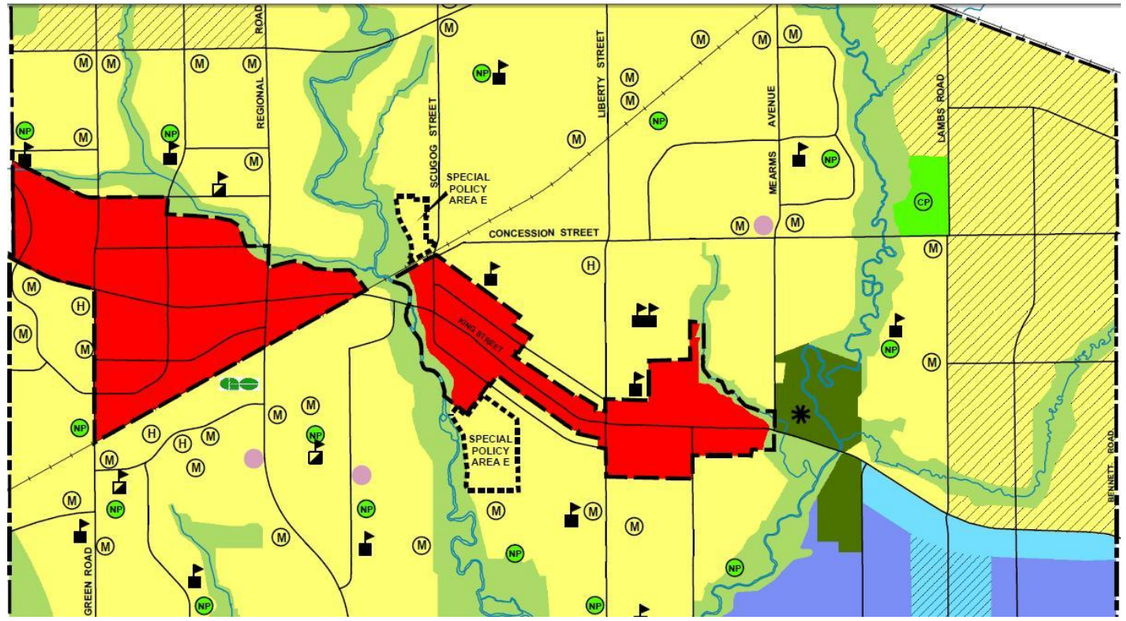
JANUARY 2, 2007

THIS CONSOLIDATION IS PROVIDED FOR CONVENIENCE ONLY AND REPRESENTS REQUESTED MODIFICATIONS AND APPROVALS

- D22 DEFERRED BY THE REGION OF DURHAM
- URBAN BOUNDARY
- FUTURE URBAN RESIDENTIAL
- URBAN RESIDENTIAL
- (M) MEDIUM DENSITY RESIDENTIAL
- (H) HIGH DENSITY RESIDENTIAL
- TOWN CENTRE
- COURTICE WEST SHOPPING DISTRICT
- NEIGHBOURHOOD CENTRE
- HIGHWAY COMMERCIAL
- PRESTIGE EMPLOYMENT AREA
- LIGHT INDUSTRIAL AREA
- GENERAL INDUSTRIAL AREA
- BUSINESS PARK
- UTILITY
- ENVIRONMENTAL PROTECTION AREA
- GREEN SPACE
- WATERFRONT GREENWAY
- (CP) COMMUNITY PARK
- (DP) DISTRICT PARK
- (NP) NEIGHBOURHOOD PARK
- PUBLIC SECONDARY SCHOOL
- SEPARATE SECONDARY SCHOOL
- PUBLIC ELEMENTARY SCHOOL
- SEPARATE ELEMENTARY SCHOOL
- SECONDARY PLANNING AREA
- SPECIAL POLICY AREA
- SPECIAL STUDY AREA
- GO STATION

N

0 125 250 500 750 1,000 Metres



MAP A3
LAND USE
BOWMANVILLE URBAN AREA

OFFICIAL PLAN
MUNICIPALITY OF CLARINGTON

JANUARY 2, 2007

THIS CONSOLIDATION IS PROVIDED FOR CONVENIENCE ONLY AND REPRESENTS REQUESTED MODIFICATIONS AND APPROVALS

N

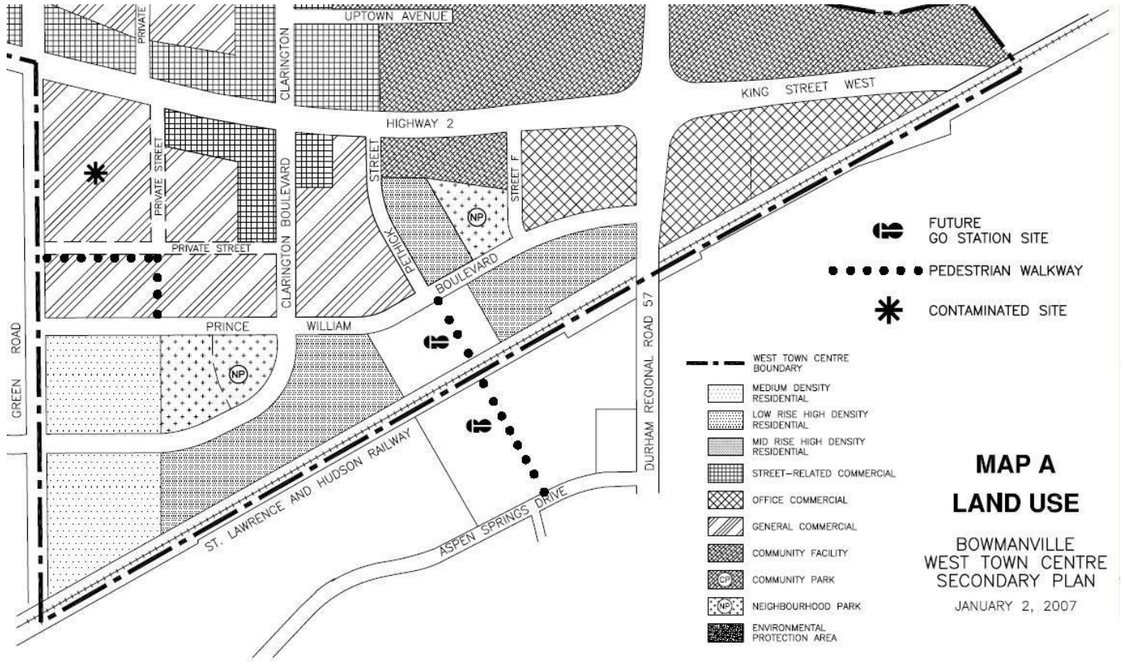
0 125 250 500 750 1,000 Metres

- URBAN BOUNDARY
- FUTURE URBAN RESIDENTIAL
- URBAN RESIDENTIAL
- (M) MEDIUM DENSITY RESIDENTIAL
- (H) HIGH DENSITY RESIDENTIAL
- TOWN CENTRE
- NEIGHBOURHOOD CENTRE
- HIGHWAY COMMERCIAL
- AGGREGATE EXTRACTION AREA
- PRESTIGE EMPLOYMENT AREA
- LIGHT INDUSTRIAL AREA
- GENERAL INDUSTRIAL AREA
- UTILITY
- ENVIRONMENTAL PROTECTION AREA
- GREEN SPACE
- WATERFRONT GREENWAY
- (CP) COMMUNITY PARK
- (DP) DISTRICT PARK
- (NP) NEIGHBOURHOOD PARK
- TOURISM NODE
- PUBLIC SECONDARY SCHOOL
- SEPARATE SECONDARY SCHOOL
- PRIVATE SECONDARY SCHOOL
- PUBLIC ELEMENTARY SCHOOL
- SEPARATE ELEMENTARY SCHOOL
- PRIVATE ELEMENTARY SCHOOL
- SECONDARY PLANNING AREA
- SPECIAL POLICY AREA
- SPECIAL STUDY AREA
- GO STATION

Municipality of Clarington Secondary Plan

As noted in **Figure 3-15** - Map A3 – Land Use Bowmanville Urban Area, the north side of the CPR line is within the Bowmanville West Town Centre Secondary Plan. As such, **Figure 3-16** illustrates the Secondary Plan boundaries and additional land use designations.

Figure 3-16 Bowmanville West Town Centre Secondary Plan Land Use Designations



East Rail Maintenance Facility Site

Existing land uses within the ERMF site primarily consist of open fields in the form of agricultural lands specifically located on both sides of Hopkins Street. Those lands immediately east of South Blair Street consist of a residential establishment, a newly developed dealership known as Durham Honda Powerhouse located at 609 Victoria Street East, and a recently demolished commercial/industrial building.

Review of the Durham Region Official Plan delineates these lands within the ERMF site as 'Employment Areas' (see **Figure 3-12**). As noted therein, 'Employment Areas' are to be separated from sensitive land uses and require an efficient guide to their development to obtain the greatest benefit for the Region. As further noted under Sub-Section 8C within the Plan, 'Employment Areas' shall be suited for a range of designations including manufacturing, assembly and processing of goods, service industries, research and development facilities, warehousing, business parks, limited personal service uses, hotels, storage of goods and materials, retail warehouses, freight transfer and transportation facilities (Durham Region Official Plan, 2008).

Review of the Town of Whitby Official Plan indicates that the ERMF site is within three (3) land use designations known as 'Prestige Industrial', 'Hazard Land', and 'General Industrial' (see **Figure 3-13**). 'Prestige Industrial' uses are designated to lands that have prime exposure to major freeways such as Highway 407 and 401. Consequently, all development within these areas shall exhibit a high standard of building design, an attractive appearance and extensive landscaping (Town of Whitby Official Plan, 2005). This land use designation shall generally include light industrial uses with enclosed buildings, professional, corporate and industrial oriented office buildings, data processing centres, commercial or technical schools, research and development facilities and incidental sales outlets within industrial buildings. As business parks may be permitted, open storage generally shall not be permitted unless a demonstrated need is presented to and approved by Council (Town of Whitby Official Plan, 2005).

The 'Hazard Land' designation ensures that related resources are protected through best management practices and with regard to environmental quality and health in accordance with the PPS. As these lands are situated adjacent to watercourses within the Town of Whitby, it is noted that development within these areas are deemed unsuitable and can result in property damage, degradation to the environment and/or loss of life (Town of Whitby Official Plan, 2005)

Due to the physical condition of 'Hazard Land', such uses as agriculture, passive recreation, conservation of soil, wildlife and fisheries habitats shall be permitted within this designation. As 'Hazard Land' may often contain ESAs, further review of Schedule C – Environmental Management does not indicate the presence of ESAs within or adjacent to the existing rail lines (Town of Whitby Official Plan, 2005).

'General Industrial' lands located north of the CNR line include manufacturing, processing, assembly, servicing, storing of goods and raw materials and warehousing. In addition, uses for similar purposes to the above, including utility yards and functions, as well as transportation terminals are permitted (Town of Whitby Official Plan, 2005). Heavy industrial uses and open storage areas are to be kept distant from other uses such as residential and ESAs and shall be located in areas with no adverse effects on surrounding areas. In other words, they should be located in the interior of industrial areas.

CNR to CPR Crossing Site

Existing land uses within the crossing site primarily includes agricultural fields on the north side of Highway 401. It is noted that this crossing will traverse Corbett Creek, Victoria Street, Highway 401, Champlain Avenue, Thornton Road, a main transmission line hydro corridor which runs parallel to Thornton Road, and the GM Spur Line, located on the east side of Thornton Road. Aside from the residential complex immediately north of Highway 401 on the west side of the crossing site, all other adjacent land uses are commercial and/or open space.

Review of the Durham Region Official Plan identifies two (2) land use designations known as 'Employment Areas' (see ERMF site for description) and 'Living Areas'. 'Living Areas' are designated as such to establish a suitable and attractive living environment that is safe, energy efficient and provides for a full range of housing which will be developed in a cost-effective manner. As per Sub-Section 8B within the Official Plan, such land use designations are to be used predominately for housing purposes and shall be comprised of boundary based communities. They shall promote urban compact planning with particular consideration to supporting and providing access to public transit. In addition, the following may be permitted:

- Certain home occupations, convenience stores, and certain public and recreational uses which are compatible with their surroundings; and

- Limited office development and limited retailing of goods and services, in appropriate locations, as components of mixed use developments, provided that 'Local Centres' are designated in the area Municipal Official Plan and the functions and characteristics of such Centres are not adversely affected (Durham Region Official Plan, 2008).

However, further review of the Official Plan indicates the presence of a future GO Rail connection from the existing GO Rail line along the CNR line to the CPR line. The Town of Whitby Official Plan designates those lands within the crossing site as 'General Industrial', 'Prestige Industrial', and 'Hazard Land' (see ERMF site for description).

The City of Oshawa Official Plan designates the crossing site to be situated within two (2) land use designations, specifically 'Industrial', and 'Special Purpose Commercial' (see **Figure 3-14**). It is noted that the City of Oshawa shall continue its traditional industrial strength and seek to achieve greater diversification in the industrial base. As such, 'Industrial' land uses along the CPR line should generally include manufacturing, warehousing and storage, assembly, processing (reclaiming and recycling), utility functions and transportation terminals (City of Oshawa Official Plan, 2007). Additional land uses including industry oriented sales, service and office operations, vehicle fuel stations, banks, professional offices, restaurants, equipment repair and building or contracting yards may be permitted.

The 'Special Purpose Commercial' land use includes specialized needs of residents with services and/or facilities that generally require large parcels of land and exposure to traffic. Such land uses may include recreational clubs, automotive service and sales, drive-in restaurants, motels, hotels, building supply yards, furniture and major appliance sales, among others.

Thornton Road GO Station Site (Thornton's Corners)

The Thornton Road GO Station site is situated primarily on agricultural fields as well as a small terrestrial cultural mixed meadow/deciduous forest site. Review of the Durham Region Official Plan identifies this area as 'Employment Areas' (see ERMF site for description). Moreover, the City of Oshawa Official Plan identifies this area as 'Industrial' (see CNR to CPR line crossing site for description).

Ritson Road GO Station Site (Oshawa GO Station NEW)

This site is situated within Central Oshawa and is surrounded by residential establishments. On the north side of the CPR line, the Ritson Road Station site is situated on abandoned CPR tracks and is immediately located south of Cowan Park, which is municipally owned. On the south side of the CPR line, the station site is situated on a derelict building, which was once operated by a large grocery store.

Review of the Durham Region Official Plan delineates this area as 'Living Areas' (see CNR to CPR line crossing site for description) and 'Regional Centre' (see **Figure 3-13**). 'Regional Centre' shall be planned and developed in conjunction with policies outlined under Sub-Section 8A – Centres and Corridors. As described therein, such centres shall be focal points of culture, art, entertainment and assembly through public facilities. In addition, centres are to favour pedestrian and public transit, promote architectural treatment and cultural heritage resources, and provide an overall balance of employment and residential growth through high density housing (Durham Region Official Plan, 2008).

The City of Oshawa Official Plan identifies the Ritson Road GO Station site as 'Residential' (see **Figure 3-14**). As such, 'Residential' land uses are designated to ensure the City has an adequate supply of housing stock through a variety of housing types and a high quality residential environment with minimal land use conflicts between residential areas and other land uses. In addition to designating such areas as residential dwellings, the following land uses may be permitted: community uses in the form of schools, churches, nursing homes, etc., parks, open space and recreational uses, convenience commercial centres, limited office, retail and personal services uses, convenience stores, home occupation uses and group homes (City of Oshawa Official Plan, 2007). It is further noted that when considering approvals for residential development, consideration is given to the accessibility of transit routes and transit stops.

Courtice Road GO Station Site (Darlington GO Station)

The Courtice Road GO Station site is surrounded by agricultural fields (e.g., cash crops including corn fields) and residential establishments which cater to farming operations on the north side of the CPR line. Some natural environmental features include forest hedgerows between agricultural fields and a deciduous forest immediately north of the CPR line. There are some commercial/industrial developments immediately south of the CPR line. The station site is situated on an active agricultural corn field.

Review of the Durham Region Official Plan delineates those lands within the Courtice Road GO Station site as 'Employment Areas' (see ERMF site for description). In addition, the Region has identified this location of Courtice Road as a future GO Station.

The Municipality of Clarington Official Plan mapping (see **Figure 3-15 – Map A2**) identifies the Courtice Road area as 'Prestige Employment Area'. These areas are comprised of lands that have a prime exposure to freeways or major arterial roads. Such a land use designation promotes professional, corporate and office buildings, data processing centres, research and development facilities, commercial or technical schools and light industrial uses with enclosed buildings. In addition, some commercial, community and recreational uses such as banks, restaurants, athletic clubs, banquet facilities, hotels, motels and trade and convention centres may also be permitted. However, the permitted uses are subject to a high level of architecture, landscaping and signage control with no outside storage or display of goods (Municipality of Clarington Official Plan, 2007).

Rundle Road Layover Facility Site

The existing land uses within the Rundle Road Layover Facility site are primarily of an agricultural setting and includes winter wheat plantations. There is one (1) residential establishment on the west side of Rundle Road, with additional sporadic residences on the east side of Rundle Road. The area immediately north of the CPR Line, south of Baseline Road includes a few commercial/industrial establishments as well as two (2) residential dwellings.

The Durham Region Official Plan identifies this site as 'Employment Areas' (see ERMF site for description). **Figure 3-15 – Map A2** of the Municipality of Clarington Official Plan identifies the Rundle Road site as 'Light Industrial Area'. As such, predominant land uses shall be used for manufacturing, assembling, processing, fabricating, repairing, research and development and warehousing. Some commercial, community and recreational uses such as banks, restaurants, athletic clubs, banquet facilities and fraternal organization may be permitted. Limited outside storage may also be permitted as well, providing certain criteria are met (Municipality of Clarington Official Plan, 2007).

Martin Road GO Station Site (Bowmanville GO Station)

Existing land uses adjacent to the Martin Road GO Station site consist of urban residential (as shown in adjacent photograph) as well as a large shopping centre located north of the station site. The station site is currently situated on vacant disturbed lands with little natural environmental features. The Region of Durham Official Plan identifies this area as a 'Regional Centre' (see Ritson Road GO Station site for description) as well as 'Living Areas' (see CNR to CPR line crossing site for description). In addition, the Region has identified this location of Martin Road as a future GO Station.

The Municipality of Clarington Official Plan mapping (see **Figure 3-15 – Map A3**) identifies the Martin Road area as a 'Town Centre' and 'Urban Residential'. The 'Town Centre' land use designation is further divided into two (2) secondary plans known as the Bowmanville East Town Centre Secondary Plan and the Bowmanville West Town Centre Secondary Plan. Within the Municipality of Clarington Official Plan, it is noted that these Town Centres will provide a fully integrated array of retail and personal service, office, residential, cultural, community, recreational and institutional uses. In addition, they will foster a sense of local identity through culture, art, entertainment and civic gathering. Details pertaining to each Secondary Plan are noted below. 'Urban Residential' shall be used for housing purposes with other permitted land uses including corner stores, home-based occupation uses, parks, schools and community facilities.

As illustrated within **Figure 3-16**, the Martin Road GO Station site has been recognized by the Secondary Plan as a 'Future GO Station Site' including a 'Pedestrian Walkway'. As per Chapter 19 – Transportation within the Official Plan states that the Municipality encourages the early extension of GO Rail service to the urban areas of Courtice and Bowmanville. In addition, the Municipality will seek to minimize and alleviate the conflicts of railways with adjacent land uses through criteria outlined in Section 19.11.1 (Clarington Official Plan, 2007). 'Pedestrian Walkways' are aspects of transit facilities within the Secondary Plan and are to be situated on or near such facilities to cross and connect to individual sites to provide efficient pedestrian movement. As illustrated, the future GO Station sites are located adjacent to 'Mid Rise High Density Residential' land uses in order to maximize future public transit opportunities.

Section 11 of the Bowmanville West Town Centre Secondary Plan supports the development of a GO Transit Station. As noted therein, the following policies apply to the future GO Station:

- The permitted uses shall be a GO Station and associated public transit facilities. Convenience commercial uses may also be permitted up to a maximum of 500 m² in association with the proposed transit station; and
- The Municipality will work with GO Transit, the Region of Durham and the landowners to ensure the development of this site for a GO Rail Station and transit terminal.

Pursuant to Section 15.3 – Public Transit Policies of the Secondary Plan, the West Town Centre will be transit-supportive though developing higher densities, and providing pedestrian linkages, among others. Moreover, the Secondary Plan notes that the municipality shall work with GO Transit and encourage the development of the GO Train Station in a timely manner (Municipality of Clarington Official Plan, 2007).

3.2.4 Recreational Land Uses

Review of Map 1 – Existing trails and Bikeways, Land use, Key Destinations, and Barriers within the June 2010 Town of Whitby Cycling and Leisure Trails Plan does not include any bikeways and trails within the Project Limits with exception of the Regional Cycling Spines designation along Victoria Street. Map 2 of the Plan proposes a boulevard multi-use path along Victoria Street and Thickson Road traversing the CNR line (Town of Whitby, 2010).

Review of the City of Oshawa Recreational Trails brochure illustrates that the CPR line traverses two (2) trails known as the Oshawa Creek Trail and the Michael Starr Trail. The Oshawa Creek Trails runs adjacent to the west side of Oshawa Creek and is approximately 7 km in length. This trail extends from Adelaide Avenue to the north and connects with the Waterfront Trail that runs parallel to Lake Ontario.
The Michael Starr Trail is 2 km in length and runs immediately adjacent to the west side of the proposed Ritson Road GO Station site. The official opening of this trail occurred on October 11, 2001 in memory of the late Colonel the Honourable Michael Starr. Through a municipal/provincial partnership, this trail was built on the CPR spur line that that City of Oshawa acquired from CPR. As previously mentioned, the Ritson Road GO Station site is to be located immediately south of Cowan Park, which is the first park to be connected by the Michael Starr Trail. This park includes a soccer field and playground (City of Oshawa Website, 2010). The Harmony Creek Trail is approximately 4 km in length and terminates at the Provincially Significant Second Marsh Class 1 Wetland. It is noted that the CPR line is immediately adjacent to Florell Park and Grandview north Park within the vicinity of the area.

3.2.5 Aboriginal Interests

Given their lengthy history in the area, and their importance as stewards of the environment, Aboriginal peoples are important participants in the study process. As noted in **Section 2.1.2** above, representatives from the Ministry of Aboriginal Affairs (MAA) as well as from Indian and Northern Affairs Canada (INAC) were contacted in request of a list of Aboriginal communities that may have an interest in this project. Information obtained from the INAC coupled with suggestions from the MOE regarding potentially impacted aboriginal communities identified several aboriginal communities of potential interest. As a result, the following Aboriginal communities were contacted as part of this study:

- Alderville First Nation
- Chippewas of Beausoleil Island First Nation
- Chippewas of Georgina Island First Nation
- Chippewas of Mnjikaning First Nation
- Chippewas of Rama Indian Band
- Curve Lake First Nation
- Hiawatha First Nation
- Huron-Wendat First Nation
- Kawartha Nishnawbe First Nation
- Mississaugas of Scugog Island First Nation
- Moose Deer Point First Nation

3.2.6 Noise and Vibration

In light of the comments received during the Open Houses in June 2009, the project team determined that noise and vibration from the proposed GO service extension from Oshawa to Bowmanville may negatively impact the surrounding built up areas. As a result, an Environmental Noise and Vibration Assessment was prepared to assess the existing

environmental noise and vibration conditions within the Project Limits and to estimate the noise and vibration impact generated by the proposed undertaking.

As noted in the 2010 Environmental Noise and Vibration Assessment completed by AECOM, eight (8) noise and vibration monitoring locations were situated throughout the Project Limits to facilitate in determining the existing noise levels as a baseline assessment to facilitate the analysis. The noise and vibration assessment was carried out in accordance with the *MOEE/GO Transit Draft Protocol for Noise and Vibration Assessment*, which was developed by the Ministry of the Environment and Energy (MOEE) and GO Transit.

Through the consideration of baseline noise assessment as a result of the existing CNR/CPR tracks coupled with adjacent land uses, the Project Limits were divided into three (3) definition zones:

Zone 1 – East of Brock Street and west of the proposed Highway 401 crossing
Zone 2 – East of the proposed Highway 401 crossing and west of the proposed Ritson Road GO Station site
Zone 3 – East of the proposed Ritson Road GO Station site and west of the proposed Martin Road GO Station site

The noise impact generated by the proposed rail service including the noise impact generated by the proposed four (4) GO Stations were predicted to fall within the acceptable noise impact limit. In addition the vibration impact of GO Transit commuter trains was assessed and predicted to fall within the acceptable vibration impact limit. However, the noise impact generated by the proposed Rundle Road Layover Facility and the proposed ERMF were predicted to exceed the applicable noise impact limits. Thus, noise mitigation measures must be considered based on administrative, operational, economic and technical feasibility.

A list of potential impacts and appropriate mitigation measures to be implemented during the construction phase is discussed in **Section 4.4.2.1** of this report. Detailed quantitative investigations on the existing and future noise and vibration within the Project Limits can be found in **Appendix F** of this report.

3.2.7 Navigable Waterways

Under the *Navigable Waters Protection Act*, approval must be obtained prior to any construction or works within designated navigable waters. Given the number of watercourse crossings within the Project Limits, a letter to Transport Canada was established to confirm the presence of navigable waterways within the Project Limits. Correspondence with Transport Canada is contained in **Appendix B**. Navigable watercourses will be identified through use of Transport Canada's screening process for navigability and through continued discussions with Navigable Water staff at Transport Canada.

3.2.8 Existing Traffic Characteristics

Existing traffic characteristics were considered as part of four (4) overall traffic impact studies within and adjacent to those lands proposed for future GO Transit Stations. Details regarding the existing traffic conditions within and adjacent to each of the GO Station sites are documented below.

Thornton Road GO Station Site (Thornton's Corners)

The proposed Station site is situated immediately west of Thornton Road, east of Kendalwood Road, south of Gibb Street and north of Champlain Avenue. These roadways carry two (2) lanes of traffic and have a posted speed limit of 50 km/h, with exception to Thornton Road, which has a posted speed limit of 60 km/h. Existing traffic volumes were obtained to provide a benchmark to facilitate with anticipated traffic volumes following construction of the proposed GO Station. Overall, 2009 traffic conditions at all of the adjacent intersections is operating at a Level of Service (LOS) 'C' or better during the AM and PM peak periods. It is noted that the only intersection operating at a LOS 'C' was at Gibb Street and Thornton Road during PM periods at a 32 second delay. Under LOS 'C' conditions, control delays are greater than 20 seconds and up to 35 seconds per vehicle. Although the number of vehicles stopping is significant through these intersections, many vehicles are still able to traverse the intersection without stopping (AECOM, 2009). Control delays include initial deceleration, queue move-up time, stopped delay, and final acceleration delay.

Ritson Road GO Station Site (Oshawa GO Station NEW)

The proposed Station site is situated west of Ritson Road and east of Simcoe Street, which carry four (4) lanes of traffic, and is adjacent to Olive Avenue, Albany Street, Front Street, Beatty Avenue, McNaughton Avenue, Howard Street, and Gibb Street, which all carry two (2) lanes of traffic with a posted speed limit of 50 km/h. Existing traffic volumes were obtained to provide a benchmark to facilitate with anticipated traffic volumes following construction of the proposed GO Station. Overall, all of the intersections within vicinity of the Station site operate at a LOS 'D' or better during the AM and PM peak periods with the exception of the 1st Avenue and Simcoe Street intersection. This intersection operates at a LOS 'E' with a V/C ratio greater than 1. In addition, the southbound through/right shared movement has a LOS 'F' as it operates with over a minute delay.

Under LOS 'D' conditions, congestion becomes more evident with longer traffic delays greater than 35 seconds and up to 55 seconds per vehicle. The traffic delays for LOS 'E' conditions are greater than 55 seconds and up to 80 seconds per vehicle while a LOS 'F' includes delays in excess of 80 seconds/vehicles.

Courtice Road GO Station Site (Darlington GO Station)

The proposed Station site is situated south of Bloor Street, east of Trulls Road, west of Courtice Road and north of Baseline Road and Highway 401. With exception of Highway 401, all roadways carry two (2) lanes of traffic with exception of Highway 401, which has a six-lane cross section and a ramp speed of 50 km/h. Bloor Street and Trulls Road have a posted speed limit of 60 km/h, Courtice Road has a posted speed limit of 80 km/h and Trulls Road has a posted speed limit of 70 km/h. Existing traffic volumes were obtained to provide a benchmark to facilitate with anticipated traffic volumes following construction of the proposed GO Station. Overall, all of the adjacent intersections based on 2009 traffic conditions are operating at a LOS 'A' during AM and PM peak periods with exception of the Bloor Street and Courtice Road intersection, which operates at a LOS 'B'. Under these conditions, there are little to no traffic delays for a LOS 'A', which is characterized by less than or equal to 10 second control delays. Short traffic delays with control delays ranging from 10 to 20 seconds are common with LOS 'B' type intersections.

Martin Road GO Station Site (Bowmanville GO Station)

The proposed Station site is situated adjacent to five (5) intersections known as Highway 2 and Pethick Street, Prince William Boulevard and Clarington Boulevard, Highway 2 and Martin Road, Highway 2 and Clarington Boulevard, and Aspen Springs Drive and Martin Road. Existing traffic volumes were obtained to provide a benchmark to facilitate with anticipated traffic volumes following construction of the proposed GO Station. Traffic operational characteristics for 2009 indicate that the above noted intersections operate at an acceptable LOS 'C' or better during AM and PM peak periods. The westbound left-turn movement at King Street and Pethick Street is expected to experience some delays with traffic volume close to its capacity.

3.2.9 Existing Businesses

It is recognized that the proposed expansion of GO services may impact/displace some existing business operations within the Project Limits as some lands are required for site facilities. As such, a list of known businesses and/or establishments within the Project Limits that may be directly impacted by the proposed extension are listed below.

East Rail Maintenance Facility Site

Part of the ERMF Site is owned by Gerdau Ameristeel, which is the fourth largest steel company and second largest mini-mill steel producer in North America, has facilities in the vicinity of the property. As previously mentioned, the existing land uses within the ERMF Site includes wetted areas, idle scrubland, and agricultural fields. Through ongoing consultation, it is the project team's understanding that a portion of the property is leased for agricultural purposes, namely the corn field plantation which has been observed several times during site reconnaissance activities.

Although the existing land uses within the ERMF Site are primarily agricultural in nature, there is one (1) commercial establishment, known as Durham Honda Powerhouse located at 609 Victoria Street, Whitby. This establishment sells Honda Motorcycles, ATVs, marine and power equipment. Immediately east of this building is a recently demolished commercial/industrial unit, which is now comprised of a vacant lot. This lot will form part of the rail tracks for the ERMF.

CNR to CPR Crossing Site

The Highway 401 crossing traverses lands within the Corbett Creek floodplain adjacent to Highway 401 as well as scrubland/agricultural fields. The crossing site south of Highway 401 and Victoria Street is situated adjacent to Valiant Mini Storage, which extends approximately 100 m east of the crossing site. Immediately north of Champlain Avenue, the crossing site is situated between a Quality Suites Hotel and a Rent All Centre, which rents several types of equipment including Skyhigh Platforms. In between these two (2) businesses is vacant agricultural farm land which is leased to a farmer for corn production. During site reconnaissance activities conducted by AECOM, it was documented that this property was advertised as being for sale.

The proposed crossing site will traverse Thornton Road and is immediately adjacent to a commercial unit with a residential property situated within. East of Thornton Road, the track will connect with the existing CPR line immediately north of the Wal-Mart Supercentre (Smart Centre complex).

Thornton Road GO Station Site (Thornton's Corners)

In addition to the aforementioned commercial unit adjacent to the CNR to CPR crossing site at Thornton Road, the proposed parking lot of the GO Station site on the west side of Thornton Road will be parallel to the Bathe & McLellan Building Material establishment on the east side of Thornton Road. This existing business is family run and includes products such as asphalt repair, brick, blocks, concrete forming, cement, concrete repair, fencing, landscaping, nails, tools, sealing, etc.

Ritson Road GO Station Site (Oshawa GO Station NEW)

The Ritson Road GO Station site is situated within a residential setting with few existing businesses. Those lands south of the existing CPR line are currently occupied by a derelict Knob Hill Farms building. The existing façade will in part be retained when designing the new station building as this is a heritage structure. The access road on the north side of from First Avenue would be situated parallel to the existing Pittsburgh Glass Work (PGW) and the Works St. Oshawa Plant Management buildings on the south side of First Avenue.

On the north side of the CPR line, the proposed Station site will be situated immediately south of Cowan Park. There are no businesses within the vicinity of this area with exception of Carlos Electric Limited, which is located approximately 60 m west of Court Street on the south side of Olive Avenue.

Courtice Road GO Station Site (Darlington GO Station)

The Courtice Road GO Station site on the north side of the CPR line is currently owned by a private landowner and leased to a farmer who utilizes the land for agricultural purposes (i.e., corn production). There are several businesses immediately south of the CPR line on the west side of Courtice Road separated by woodlot and include Rockett Lumber and Brandom Kitchen & Bath Centre. Additional businesses on Cigas Road that back onto the south side of the CPR line include Courtice Truck & Trailer, Philip Powers Auto Transport, and Unrise Welding & RO.

Rundle Road Layover Facility Site

The Layover Facility site is situated on agricultural fields owned by private land owners. It has been previously noted that a farmer has an agreement with the existing property owners to raise cash crops within the subject lands. On the north side of the CPR line are a few existing businesses that back onto the northern limits of the CPR ROW, with direct access to Baseline Road including Rick's Collision and Truss Centre Millwork.

Martin Road GO Station Site (Bowmanville GO Station)

Primarily situated within a residential setting, the proposed Station site is situated immediately adjacent to the Aspen Springs Community Sales Centre on the south side of the CPR line. On the north side of the CPR line and bounded by Pethick Street, Clarington Boulevard, and immediately north of Prince William Boulevard, is a Canadian Tire. Additional commercial businesses are located west of Clarington Boulevard and include Zellers, Payless Shoe Source, Hakim Optical, and Kelsey's.

3.3 Cultural Environment

3.3.1 Built Heritage

There are two built heritage features within proximity to the proposed works, but neither is being impacted. The first is a home on the southeast corner of Victoria Street and South Blair Avenue and the second is the former Knob Hill Farm on Front Street (as shown in adjacent photograph) both of which are being maintained.

3.3.2 Archaeological Resources

A Stage 1 and 2 archaeological assessment was conducted by Timmins Martelle Heritage Consultants Inc. (TMHC) within the Project Limits, including the proposed facility and station sites as well as the Highway 401 crossing. The Stage 1 background review gathered information about known and potential cultural heritage resources based on the area's physical characteristics, historic maps, relevant documents, land use history, the provincial archaeological database and a preliminary field reconnaissance. This review indicated that the Project Limits and each of the seven (7) proposed construction properties had potential for First Peoples and/or historic era archaeological resources. Therefore, a Stage 2 field assessment was conducted, which involved a combined pedestrian and test pit archaeological assessment, using a five (5) metre interval.

Details of the methods, results and recommendations from the Stage 1 and 2 archaeological assessments can be found in **Appendix G** of this report.

East Rail Maintenance Facility

The Stage 1 assessment determined that the ERMF demonstrated potential for First Peoples archaeological sites due to its proximity to Pringle Creek. It also had potential for historic era archaeological sites due to the potential presence of a historic structure, its proximity to a 19th century rail line (the Grand Trunk) and 19th century thoroughfares (Victoria Street and Hopkins Street) as well as general proximity to Pringle Creek.

During the Stage 2 assessment, several low-lying and/or disturbed areas were considered to have low archaeological potential and were not assessed. Areas of archaeological potential were ploughed and assessed via pedestrian survey. No archaeological material was noted during the assessment.

CNR to CPR Crossing Site

The Stage 1 background review identified the potential for First Peoples archaeological resources since the proposed new alignment crosses Corbett Creek and is within 250 m of registered First Peoples archaeological sites. There was also potential for historic era archaeological resources due to the alignment's proximity to Corbett Creek, the 19th century rail line (the Grand Trunk), documented 19th century structures, and 19th century thoroughfares (Victoria Street and Thornton Road).

Several low-lying and/or disturbed areas were considered to have low archaeological potential and were not assessed during Stage 2 field assessment. Areas of archaeological potential were ploughed and assessed via pedestrian survey or test pits. No archaeological material was identified.

Thornton Road GO Station Site (Thornton's Corners)

This Station's proximity to Corbett Creek and known registered native sites establish its potential for First Peoples archaeological sites. The Stage 1 assessment also identified the site's potential for historic era archaeological resources given its proximity to Corbett Creek, a 19th century thoroughfare (Thornton Road South), and two (2) 19th century structures associated with a documented settler.

During the Stage 2 assessment, the majority of the property was assessed via pedestrian survey while other areas were subject to test pit survey. Archaeological material was identified in one (1) location that is likely all one (1) large site, including the former house lot in the northwest corner of the parcel and the adjacent agricultural field. A total of 293 surface and ploughzone artifacts were recovered from this location, including structural remains, table ceramics, kitchen ceramics, animal remains, metal hardware, bottle and container glass, personal items, and miscellaneous items. The recovered artifacts are indicative of a wide time range of site occupancy, with the majority being late 19th century artifacts. Some items could be from as early as the mid-1840s (e.g., whiteware with blue sponging), and others are from the 20th century if not very recent times (e.g., plastic items, concrete features). The absence of pre-1830s table ceramics indicates the site was not likely occupied much before the 1840s. A tentative date of circa 1850s through 20th century date is anticipated. The site is likely associated with a structure shown on the 1877 map in the same location; this structure also appears on the 1930 topographic map of the property, which supports the potential for occupation extending into the 20th century. The site was deemed potentially significant and was recommended for Stage 3 testing.

Stage 3 testing was carried out in the fall of 2009. Since that time, the layout of the proposed Station site was changed to completely avoid the archaeological site area so it will be completely protected from impact.

Ritson Road GO Station Site (Oshawa GO Station NEW)

This Station site is not in proximity to potable water, known archaeological sites or other features that would indicate high potential presence of First Peoples sites. There was some potential for historic era archaeological resources because the subject lands are within Oshawa's settlement core; however, it is not in close proximity to major 19th century transportation routes.

During the Stage 2 assessment, disturbed lands were deemed to be of low archaeological potential and were not assessed. Other areas were subject to test pitting, but no archaeological material was identified.

Courtice Road GO Station Site (Darlington GO Station)

The Stage 1 assessment demonstrated that this site had potential for the discovery of First Peoples archaeological resources because it is crossed by a seasonal branch of Tooley Creek and two (2) registered native sites are in close proximity to the property south of the rail line. The assessment also identified the site's high historic era archaeological potential due to its proximity to a structure documented on a historic 1878 map, as well as a 19th century transportation corridor (Courtice Road).

Disturbed lands were not assessed during the Stage 2 field assessment because they were considered to have low archaeological potential. The rest of the site was assessed using test pitting. No archaeological material was noted during the assessment.

Rundle Road Layover Facility Site

The Stage 1 assessment identified that the Layover Facility site contains and is in close proximity to several small remnant watercourses, a branch of Darlington Creek is roughly 150 m to the north/northeast of the property and two (2) archaeological sites are on adjacent or nearby properties. Therefore, this site was demonstrated to have potential for the discovery of First Peoples archaeological resources. The property also had high potential for historic era archaeological sites due to its proximity to a historic rail line and two (2) 19th century thoroughfares (Solina Road and Rundle Road).

The Stage 2 assessment for the Rundle Road Layover Site has not yet been completed and is in progress. Permission to access some of the parcels within the Rundle Road property is pending as is ploughing of the agricultural land.

Martin Road GO Station Site (Bowmanville GO Station)

This site has minimal potential for the discovery of First Peoples sites due to the absence of mapped watercourses near the site and no reported archaeological sites nearby. The Stage 1 assessment determined that the site did have potential for the discovery of historic era archaeological resources due to its proximity to two (2) 19th century thoroughfares (Highway 2 – the Kingston colonization road – and Martin Road).

During the Stage 2 assessment, it was determined that the property, either north or south of the existing tracks, does not retain archaeological potential due to extensive prior disturbance. Therefore, no assessment was carried out.

3.4 Transportation

3.4.1 Rail Infrastructure

GO Transit is the inter-regional transit authority that provides commuter bus and rail service within and outside the GTA. At present, GO Transit services extend from Union Station in Toronto to the Oshawa GO Station along the Lakeshore East Line. The existing Oshawa GO Station (as shown in adjacent photograph) has 2,424 parking spaces and is located at 915 Bloor Street West within the City. Moreover, the Station is shared with VIA Rail trains running from Toronto to Ottawa as well as Montreal.

Existing rail infrastructure within the Project Limits involves two (2) freight lines, namely CNR and CPR, as well as the two (2) aforementioned passenger/commuter services. As noted in **Table 3.11** below, the existing rail infrastructure traffic is subdivided into three (3) zones. Zone 1, includes existing rail infrastructure from east of Brock Street to west of the proposed Highway 401 crossing along the CNR line. It is noted that this zone includes GO/VIA locomotives as well as CNR freight. Zone 2, includes rail traffic from east of the Highway 401 crossing site to west of the Ritson Road GO Station site, which only includes CPR line freight. Zone 3, includes existing CPR freight services from east of the Ritson Road GO Station site to west of Bragg Road (eastern Project Limits).

Table 3.11 Existing Rail Service Traffic Zones within the Project Limits

Zone	Train Type	Existing Rail Traffic (Year 2010)		Maximum Number of Cars	Maximum Number of Locomotives
		Day-Time	Night-Time		
Zone 1	CNR Freight	16	6	140	4
	CPR Freight	0	0	140	5
	VIA Passenger	20	0	15	2
	GO Commuter	44	9	12	1
Zone 2	CNR Freight	0	0	140	4
	CPR Freight	14	9	140	5
	VIA Passenger	0	0	15	2
	GO Commuter	0	0	12	1
Zone 3	CNR Freight	0	0	140	4
	CPR Freight	14	9	140	5
	VIA Passenger	0	0	15	2
	GO Commuter	0	0	12	1

(AECOM, 2009)

3.4.2 Road Infrastructure

The CNR line and CPR line traverses a number of regional and local roads within the Project Limits, which are noted in **Table 3.12** below.

Table 3.12 Road Infrastructure within the Project Limits

Roadway	Railway Line	Jurisdiction	Characteristics
Brock Street	CNR	Regional	Road over Rail
Victoria Street	CNR	Regional	Rail over Road
South Blair Street	CNR	Municipal	At Grade
Hopkins Street	CNR	Municipal	Road over Rail
Thickson Road	CNR	Regional	Rail over Road
Proposed Highway 401 CNR to CPR rail Crossing			
Stevenson Road	CPR	Regional	Road over Rail
Park Road	CPR	Regional	Road over Rail
Simcoe Street	CPR	Regional	Road over Rail
Albert Street	CPR	Municipal	Road over Rail
Ritson Road	CPR	Regional	Road over Rail
Wilson Road	CPR	Regional	Rail over Road
Harmony Road	CPR	Regional	Road over Rail
Bloor Street	CPR	Regional	At Grade
Prestonvale Road	CPR	Municipal	At Grade
Trulls Road	CPR	Municipal	At Grade
Courtice Road	CPR	Regional	Road over Rail
Baseline Road	CPR	Municipal	At Grade
Rundle Road	CPR	Municipal	At Grade
Baseline Road	CPR	Municipal	At Grade
Holt Road	CPR	Municipal	At Grade
Maple Grove Road	CPR	Municipal	At Grade
Martin Road	CPR	Regional	Road over Rail

Victoria Street Environmental Study Report (ESR)

Victoria Street (Regional Road 22) accommodates east-west vehicular travel in the Town of Whitby and is also an integral part of east-west arterial road system south of Highway 401 which extends from Whites Road in Pickering to Harmony Road in the City of Oshawa. Within the Project Limits, a Class Environmental Assessment (Class EA) is currently underway for the realignment of Victoria Street between South Blair Street and Thickson Road. This realignment has been recognized in the Town of Whitby and Durham Region Official Plans. It is noted that this study will include the realignment of Victoria Street when conducting the preliminary design of the ERMF.

Hopkins Street Environmental Study Report (ESR)

In response to increased traffic volumes in the area, Durham Region has recently initiated a Class Environmental Assessment to confirm the need for a proposed Highway 401 crossing at Hopkins Street from the future Victoria Street

(Regional Road 22) re-alignment to consumers Drive (Regional Road 25). At the time of writing this report, the Class EA was still underway.

Consumers Drive Environmental Study Report (ESR)

In November, 2005, an ESR was completed documenting the Consumers Drive extension from Thickson Road to Thornton Road within the Town of Whitby and the City of Oshawa. It is noted that the Consumers Drive extension to Thornton Road would address all of the problems and opportunities identified in the ESR (i.e., safety, traffic, and road network connectivity, etc.) and is in accordance with the Regional Transportation Master Plan. It is noted that the proposed extension of Consumers Drive to Thornton Road would occur south of the Thornton Road GO Station site.

Gibb Street Environmental Study Report (ESR)

Durham Region has initiated a Class EA for improvements on Gibb Street/Olive Avenue (Regional Road 59) from Stevenson Road (Regional Road 53) to Ritson Road (Regional Road 16) in response to growing traffic volumes in the southern section of the City of Oshawa. With these growing traffic demands, there is an increasing demand for east-west corridor roadway capacity north of Highway 401 and a need to provide a more efficient connection between Gibb Street and Olive Avenue (Region of Durham Website, 2010). At the time of writing this EPR, the Class EA Study preferred alignment has been recommended and the ESR will shortly be completed and made available for a 30-day public review period.

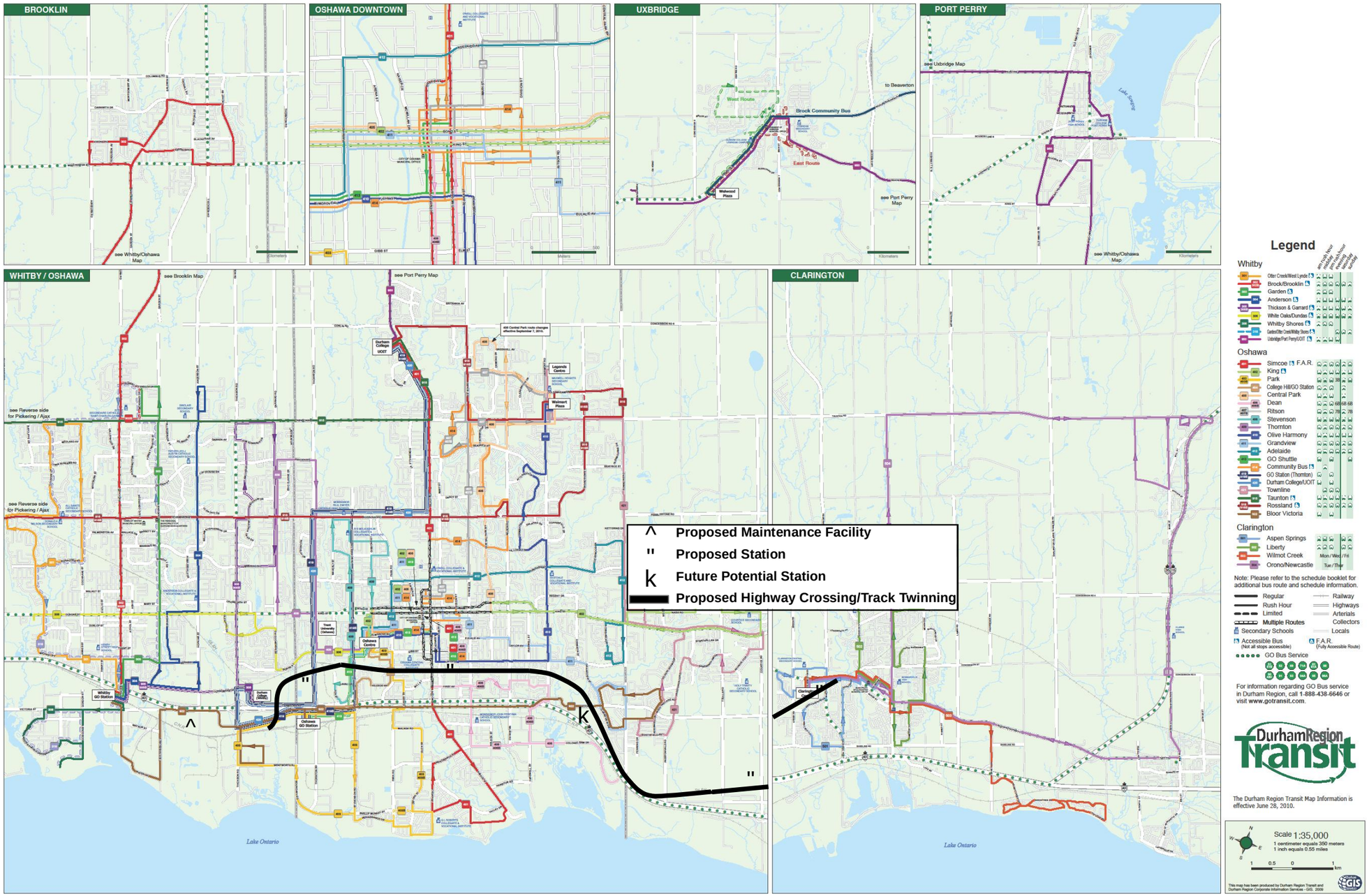
3.4.3 Transit Network

Bus services within the Project Limits are provided by Durham Region Transit (DRT), and GO Transit. DRT is an integrated transit system that provides service within the three (3) municipalities within the Project Limits as well as access to other areas of Durham Region and the GTA. As noted within **Figure 3-17**, DRT and GO Bus Services provide transportation within and adjacent to each of the proposed GO facilities. This further promotes the respective municipal transportation master planning documents to establish an inter-connected public transit system within and beyond the Region's municipal limits. As noted in **Table 3.13,** the following transportation bus services are available adjacent to each of the proposed GO facilities.

Table 3.13 Transportation Bus Services within the Project Limits

Roadway	Route Number	Route Name	Availability
East Rail Maintenance Facility Site			
South Blair Street	922	Bloor Victoria	AM/PM Rush Hour
Victoria Street	922	Bloor Victoria	AM/PM Rush Hour
Highway 401	GO Bus Service		
Thornton Road GO Station Site			
Thornton Road	419	GO Station (Thornton)	AM/PM Rush Hour
Thornton Road	420	Durham College/UOIT	AM/PM Rush Hour
Thornton Road	409	Thornton	Full Service
Burns Street	306	White Oaks/Dundas	Full Service
Ritson Road GO Station Site			
Olive Avenue	410	Olive Harmony	Full Service
First Avenue	406/406B	Dean	Full Service
Simcoe Street	401	Simcoe (Fully Accessible Route)	Full Service
Simcoe Street	413	GO Shuttle	AM/PM Rush Hour and Sunday
Simcoe Street	414	Community Bus	Midday
Simcoe Street	406/406B	Dean	Full Service
Simcoe Street	GO Bus Service		
Martin Road GO Station Site			
Martin Road	501	Aspen Springs	Full Service with exception of Evenings
Prince William Boulevard	503	Wilmot Creek	Full Service (Mon, Wed, Fri)
Prince William Boulevard	504	Orono/Newcastle	Full Service (Tues, Thurs)
Martin Road/Prince William Boulevard	GO Bus Service		

Figure 3-17 Durham Region Transit Bus Routes



4. Recommended Transit Project

Section 9 of the *Ontario Regulation 231/08* (Transit Projects and Greater Toronto Transportation Authority Undertakings) states that the EPR should document the proponent's assessment and evaluation of the impacts that the preferred method of carrying out the transit project and other methods might have on the environment, and the proponent's criteria for assessment and evaluation of those impacts. The regulation also states that the project should describe any measures proposed by the proponent for mitigating any negative impacts that the preferred method of carrying out the transit project might have on the environment and how this method will be monitored or verified. As such, the purpose of this chapter is to document the above noted requirements. In consideration of the alternatives considered through ongoing consultation with regulatory agencies, members of the public, existing baseline environmental conditions, and subsequent environmental studies the project team assessed the options with respect to the natural, socio-economic, cultural, and engineering environments.

4.1 Alternatives Considered

4.1.1 Feasibility Study (Pre-EA Planning Alternatives)

4.1.1.1 Rail Corridor Alternatives

In December 1993, GO Transit completed an Environmental Assessment (EA) Report entitled "GO Transit Service Expansion Program – Oshawa West to Oshawa East Study". Planning for the extension of commuter transit services along the Lakeshore East corridor has been ongoing since 1982 when the Province announced the Provincial Inter-Regional Rapid Transit Strategy (GO, 1993). The strategy included extending GO services from Pickering to the east end of Oshawa using Advanced Light Rail Transit. The Project Limits extended from the east limits of the Town of Whitby to Courtice Road in the Municipality of Clarington (then referred to as the Town of Newcastle). The Environmental Assessment (EA) recommended two (2) GO Station sites along the Canadian Pacific Rail (CPR) line at Stevenson Road and Gibb Street and east of the Holiday Inn at Bloor Street. An ultimate six-train layover site was recommended on the south side of the CPR line east of Prestonvale Road.

In April 2009, AECOM Canada Ltd. was retained to carry out a Feasibility Study for the Oshawa East Track Extension and New Rail Maintenance Facility. The Feasibility Study expanded on the aforementioned December 1993 EA completed by GO Transit. As an expansion to the 1993 EA, the Feasibility Study established a range of study objectives and considered possible station sites and maintenance facility locations on the CPR line and the Canadian National Rail (CNR) lines. (see **Figure 4-1**). It is noted that the recommended sites from the 1993 EA were considered as part of this Feasibility Study.

The use of the CPR versus CNR line and possible station and maintenance facility sites as illustrated in **Figure 4-1** were assessed through an in-depth analysis of several evaluation criteria (i.e., socio-economic and proximity impacts, impacts to future land uses within the area, patron access and egress to the station sites, impacts to roads and traffic in the surrounding area, environmental impacts, preliminary costs, and logistical challenges, etc.) coupled with extensive consultation with municipalities, Central Lake Ontario Conservation Authority (CLOCA), the Ministry of Transportation and CNR/CPR. The evaluation of the possible GO facilities as documented in the Feasibility Study were accordingly ranked in order of preference as noted in **Table 4.1.**

Table 4.1. Evaluation Ranking for the Potential GO Station Sites

Possible GO Facility Site	Ranking
CNR Possible Station Sites	
CN 5 (East of Martin Road)	1
CN 2 (Courtice Road)	2
CN 3 and 4 (West and East of Martin Road)	3
CN 6 (East of Martin Road)	4
CN 1 (Bloor Street)	5
CNR Possible Maintenance Facility Sites	
CN 1 (Osbourne Road crossing Courtice Road)	1
CN 2 (Crosses Bennett Road)	2
CPR Possible Station Sites	
CP 5 (Martin Road)	1
CP 6 (Lambs Road)	2
CP 4 (Courtice Road)	3
CP 2 and 3 (Bloor Street/Ritson Road)	4
CP 1 Stevenson Road	5
CPR Possible Maintenance Facility Sites	
CP 2 (Rundle Road)	1
CP 3 (Providence Road)	2
CP 1 (Prestonvale Road)	3

The results from these evaluations were then considered as part of the overall CNR/CPR rail corridor evaluation, which was separately assessed with the pre-defined evaluation criteria listed above, which is further documented in **Table 4.2.** In consideration of the above analysis/evaluations and discussions with regulatory agencies, it was determined that the CPR corridor best presents overall service to the community (AECOM, 2009). In addition, the route selection study recommended the CPR line based on:

- Enabling communities to further provincial goals of land use intensification and long range transit integration;
- Best in meeting municipal transportation and land use planning goals/objectives;
- Best at offering ability for residents to use transit between home and train; and
- Best in aiding communities in revitalizing central areas.

It is noted that all of the evaluated sites considered during the Feasibility Study along the CPR line were carried forward as part of this EA. To this end, the Feasibility Study recommended the CPR line on which to expand GO services because:

"The development of this corridor will provide the best benefit to the communities, enabling them to continue to meet the Province's goals while receiving an excellent commuter rail connection to the rest of the GTA. This alternative can be best implemented through the proposed CN-CP connection, just to the east of Thickson Road. The CN corridor

alternative appears very likely to generate adverse road traffic impacts as the station sites would be located away from the populated areas."

Table 4.2 CNR/CPR Rail Corridor Evaluation Ranking

Group	Sub-Group	SITE	
		CNR	**CPR**
Legend: Most Preferred 0-1; Moderate 2-3; Least Preferred 4-5			
Station Sites		3	2
Station Terminus Sites		4	2
Maintenance Facility Sites		3	2
Municipal Support		4	2
Environmental Issues		3	3
Socio-Economic Impacts	No. Residences impacted	2	3
	No. Commercial Property Impacted	3	2
	No. Agricultural Property Impacted	3	3
	Meets Communities Plan	4	1
	Creates Community Improvements	4	1
Proximity Impacts	No. of Residences Visually Impacted	2	3
	No. Commercial Property Visually Impacted	3	3
	Residents Impacted by Noise	2	3
	Commercial Property Impacted by Noise	3	3
	Residents Impacted by Vibration	2	3
	Commercial Property Impacted by Vibration	3	3
Impact on Future Land Use	Residential Intensification	4	2
	Commercial Intensification	4	2
	Residential Development	2	2
	Commercial Development	2	2
	Fits into Community	4	1
Patron Access/Egress	Regional Access for Local Transit	3	2
	Regional Access for Automotive Traffic	3	1
	Local Access for Bicycle	3	2
	Local Access for Walking Passages	3	2
	Enables Mobility Hubs	2	2
Road and Traffic Impacts	Safe Station Road Access	1	1
	Main Roads	3	2
	Secondary Roads	2	3
	No. of Access Points to Station	3	2
	Local Traffic Impacts	3	3
	Enables mobility Hubs	3	1
Environmental Impacts	Vegetation	2	2
	Wildlife	2	1
	Fisheries	1	1
	Ecosystems	1	1
Probable Costs	Station and Building Facilities	3	3
	Parking	3	2
	Rail Corridor Infrastructure	2	5
	Road Works	3	2
	Property	2	4
Logistical Challenges	CNR/CPR Connection	0	4
	VIA	3	2
	Rail Maintenance Facility	2	2
	Second Mainline	3	2
	Terminal Station Operations	1	3
		121	103
			Preferred

It should be noted that the evaluation rankings shown in Tables 4.1 and 4.2 represent an arithmetic evaluation methodology used during the Feasibility Study. Another evaluation methodology, referred to as "reasoned argument" is also commonly used in EA studies to present the advantages and disadvantages of design alternatives in a comparative manner. The same numeric information presented in Table 4-2 could be summarized as shown below on **Table 4.3** and be described as advantages and disadvantages of the CNR versus CPR mainline.

Table 4.3 CNR versus CPR Mainline Advantages and Disadvantages

Evaluation Criteria	CNR Mainline		CPR Mainline	
	Advantages	Disadvantages	Advantages	Disadvantages
Station Sites		- Does not support station sites	- Facilitates station site development	
Station Terminus Sites		- Does not facilitate station terminus sites	- Supports station terminus sites	
Municipal Support		- Is not preferred by municipalities	- Municipalities support this option	

Evaluation Criteria	CNR Mainline		CPR Mainline	
	Advantages	Disadvantages	Advantages	Disadvantages
Socio-Economic Impacts	- Has slightly fewer direct residential impacts	- Impacts more commercial properties - Does not meet community planning objectives - Does not create community improvements	- Has fewer impacts to commercial areas - Meets community planning objectives - Provides good potential for community improvements - Transit availability	- Has more potential to impact residences, but impacts can be mitigated where warranted
Proximity Impacts	- Less potential for visual, noise and vibration impacts to residences			- Slightly more potential for visual, noise and vibration impacts to residences, but changes to views are minimal since existing rail corridor is being twinned and noise impacts can be mitigated where warranted
Impact on Future Land Use		- Does not support future residential or commercial intensification - Does not fit into community	- Facilitates better intensification of residential and commercial land uses - Fits better into community	
Patron Access/Egress		- Does not offer good regional access for local transit or automotive traffic - Does not offer good local access for cyclists or pedestrians	- Provides good regional access for local transit and automotive traffic - Provides good local access for cyclists and pedestrians	

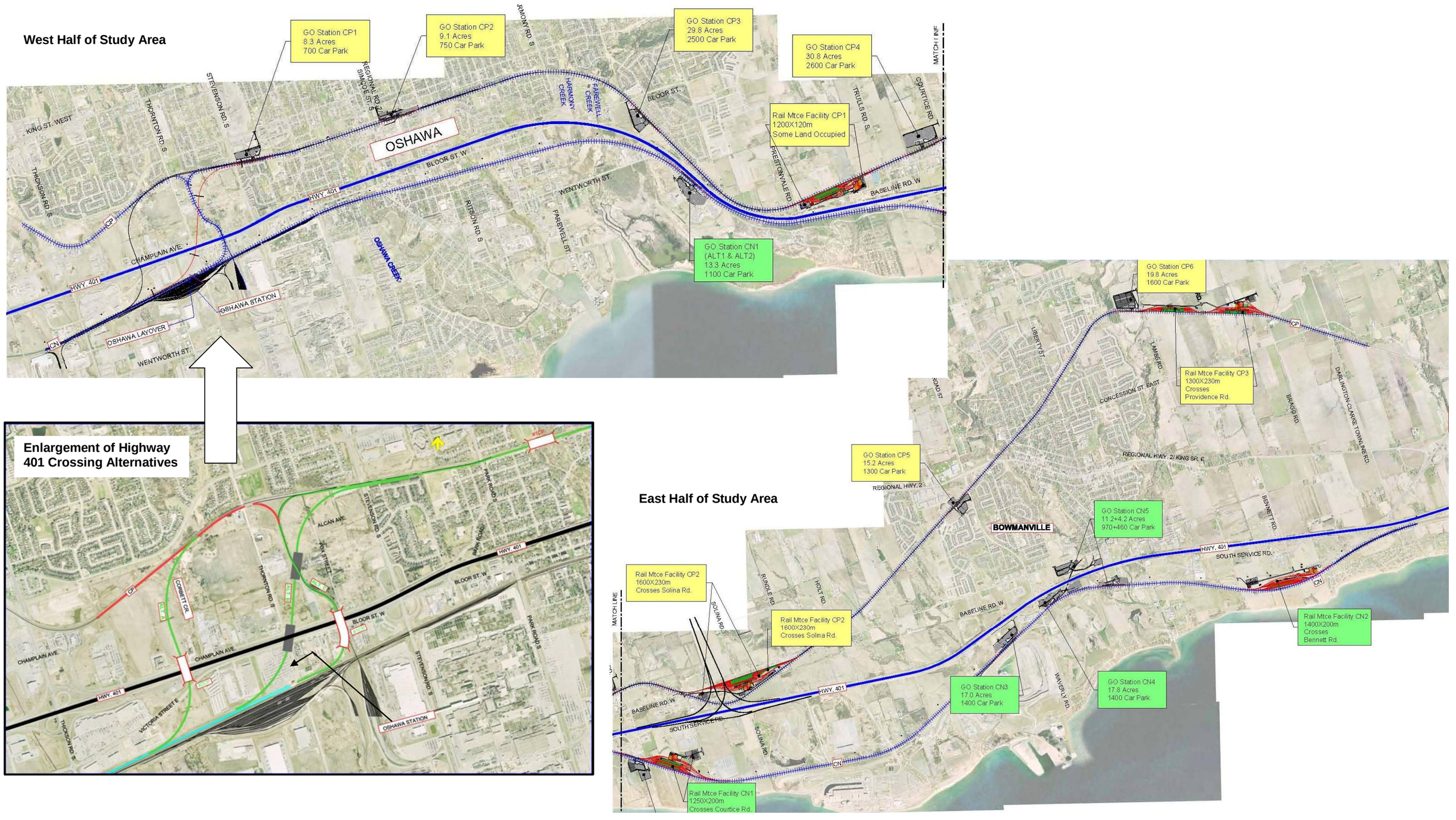
Evaluation Criteria	CNR Mainline		CPR Mainline	
	Advantages	Disadvantages	Advantages	Disadvantages
Road and Traffic Impacts	- Less traffic impact on secondary roads	- Greater traffic impact on main roads - Does not provide adequate number of access points to stations - Does not enable mobility hubs	- Less traffic impact on main roads - Provides good number of access points to stations - Enables mobility hub development	- Slightly greater traffic impact on secondary roads
Environmental Impacts		- More potential for negative impacts on wildlife associated with watercourses and wetlands along northern shoreline of Lake Ontario	- Less potential for negative impacts on wildlife, further upstream of Lake Ontario	
Probable Cost	- Lower cost for rail corridor infrastructure - Lower cost for property acquisition	- Higher cost for parking lots - Higher cost for road works	- Lower cost for parking lots - Lower cost for road works	- Higher cost for rail corridor infrastructure - Higher cost for property acquisition
Logistical Challenges	- Eliminates the need for the CNR to CPR connection - Fewer logistical issues for terminal station operations	- More conflicts with VIA operations - More impact of a second mainline	- Fewer conflicts with VIA operations - Less impact of a second mainline	- Creates challenges with the CNR to CPR connection; however, many of these issues have already been identified and addressed - Issues surrounding terminal station operations

Evaluation Criteria	CNR Mainline		CPR Mainline	
	Advantages	Disadvantages	Advantages	Disadvantages
Overall Summary	**Not Preferred because:** - Does not support station site or terminus site - Does not facilitate long-term goals of community improvement and revitalization; - Does not fit into the surrounding community; and - Does not offer good access for local transit, automotive traffic, cyclists or pedestrians.		**Preferred because:** - It enables communities to advance provincial goals of land use intensification and long range transit integration; - Best in meeting municipal transportation and land use planning goals/objectives; - Best at offering ability for residents to use transit, cycle or walk between home and train station; and - Best in aiding communities in revitalizing central areas.	

Both methods of evaluating alternatives (i.e., arithmetic and reasoned argument) in the pre-planning phase of the study resulted in identifying the CPR line as the Preferred Plan and most balanced solution when considering the full range of evaluation criteria.

The CPR line was therefore carried forward in the study process along with several design alternatives for stations, a layover site, a Highway 401 crossing and the rail maintenance facility as described in the following sections.

Figure 4-1 Potential GO Transit Station, Layover and Highway 401 Crossing Alternatives Considered



4.1.1.2 Rail Maintenance Facility Alternatives

As a separate undertaking, GO Transit retained the services of Hatch Mott MacDonald to conduct a Feasibility Study for a new rail maintenance facility. As noted in the June 2009 report, the study was initiated to consider a new facility along the Lakeshore East corridor between Union Station and the existing Oshawa GO Station, a distance of approximately 50 km. The need for an additional rail maintenance facility was derived from recent increases in planned growth in commuter service within the GTA. In addition, GO Transit's existing rail maintenance facility located at the Willowbrook Yard has reached operational capacity with no room for any further expansion. In consideration of seven (7) sites (three (3) within the City of Toronto, three (3) within the City of Pickering and the Town of Ajax, and one (1) within the Town of Whitby), Site 'G' within the Town of Whitby was chosen as the preferred alternative. All alternatives were screened from a list of evaluation criteria including available property, property characteristics, proximity to Union Station, compatible land use/zoning, infrastructure impacts/upgrades, functional sustainability, impact on neighbouring areas, social impacts, and environmental impacts (Hatch Mott MacDonald, 2009).

4.1.2 Design Alternatives

4.1.2.1 Alternative GO Station Sites

Through ongoing consultation with respective regulatory agencies as outlined in **Chapter 2** of this Environmental Project Report (EPR), extensive input was obtained to confirm the recommended transit project as outlined in **Section 4.2** below. During the early phases of this study (i.e., pre Notice of Commencement), six (6) alternative GO Station sites were presented as alternatives to regulatory agencies, municipalities and the public to seek input on alternative station sites within the preferred CPR corridor. A detailed inventory of correspondence received to supplement or alter the preliminary preferred location sites is documented in **Appendix A.** It is noted that regulatory agency preference given to these sites was considered with respect to provincial/municipal land use planning policies, environmental issues, as well as socio-economic considerations and technical analysis of each site. A brief description of the alternative sites considered as part of the pre-notification phase of this study and presented at the June 2009 public Open Houses is described below. Details regarding the description of the preferred transit project are outlined in **Section 4.2**.

Potential GO Station at Stevenson Road (Oshawa)

The potential GO Station at Stevenson Road was presented at the first round of public Open Houses in June 2009. The station site was situated immediately north of the CPR line on the east side of Stevenson Road in the City of Oshawa and would traverse Goodman Creek, which runs in a meandering form immediately north of the CPR line.

Geographic information received from CLOCA identifies that this site is within the Oshawa-Goodman Creek Valley Environmentally Sensitive Area (ESA), is within CLOCA's generic regulation limits, and is within a zone of potential flooding. In addition to these environmental issues, this site was no longer a preference given its restricted size due to development in the area. The City of Oshawa also noted that this site is constrained by the extent of access to the site, in addition to being constrained in terms of size. **This alternative was therefore not carried forward.**

Potential GO Station at Ritson Road (Oshawa)

The potential GO Station at Ritson Road was presented at the first round of public Open Houses in June 2009 and was situated entirely on the north side of the CPR line between Simcoe Street and Ritson Road. As a second proposed central Oshawa GO Station site, CLOCA noted that it had no environmental concerns with the location of the Ritson Road potential GO Station. In comparison to the above mentioned potential GO Station at Stevenson Road, the City of Oshawa suggested several advantages for a future GO Station and mobility hub at this location because:

- It is well connected to Highway 401;
- Local access is excellent;
- Proximity to downtown is excellent;
- Future rapid transit planned along Simcoe Street will support the development of the area as a mobility hub;
- Abandoned rail lands could also be used for parking;
- Former Knob Hill Farms warehouse (derelict) could also provide space for mobility hub; and
- West side of the Knob Hill site includes a "Class A" heritage building (but not designated under the Ontario Heritage Act) that could be integrated into future development.

The City further noted that both sides of the CPR line could be used and suggested that the north side of the CPR line offers a premium transit experience for those who would walk, cycle, carpool or take transit to the GO Station and that the south lot could be used by those who drive to the Station. **This alternative was therefore carried forward.**

Potential GO Station at Bloor Street (Oshawa)

The potential GO Station at Bloor Street was also presented at the first round of public Open Houses in June 2009. The station site was situated south of Bloor Street on the west side of the CPR line (north of Highway 401), parallel to Downview Crescent. As a result of several discussions with CLOCA, it was noted that this site is within the Harmony Creek and Farewell Creek floodplain as well as a Special Policy Area (SPA). It would take about a 6 x 3 m diameter new overflow culvert under the CNR line to get the station out of the floodplain.

Additional construction of the proposed Bloor Street Station may significantly constrain options for rail detours during construction of a future Bloor Street/CPR line grade separation. Although this Station is located at an eastern gateway to Oshawa and is of interest to the City, it will not be built in the initial phases of work. However, it is being identified as a long-term future potential site that will be developed when other stations reach capacity. **This alternative was therefore carried forward as a future potential site.**

Potential GO Station at Courtice Road (Clarington)

The potential GO Station at Courtice Road was presented at the first round of public Open Houses in June 2009. The potential station site is located on the north side of the CPR line immediately west of Courtice Road. Through discussions with CLOCA, no significant environmental concerns were identified with the exception of the woodlot immediately north of the CPR line. CLOCA noted that appropriate mitigative measures should be prescribed to minimize impacts to this woodlot.

Further to the minimal environmental concerns, the proposed GO Station site provides accessibility to Highway 401 as there is an existing interchange at Courtice Road, and facilitates future growth in the area. It is noted that the vicinity of this area is slated for a future business park/general industrial area as per the Official Plan. In addition, an east/west main road is being planned for the area immediately north of the station, which will in turn facilitate with better access and additional urban growth. **This alternative was therefore carried forward.**

Potential GO Station at Martin Road (Clarington)

The potential GO Station at Martin Road was presented at the first round of public Open Houses in June 2009. The potential station site is located on both sides of the CPR line immediately west of Martin Road (Regional Road 57). Through consultation with the Municipality of Clarington regarding the proposed site, it was suggested that this site be developed to complement the principles of transit station development outlined in the Metrolinx Regional Transportation Plan and the policies on transit planning in the Provincial Growth Plan. Additionally, this site is close to major transportation routes and progressive urban development in Bowmanville and was determined to have a low impact on the surrounding environs. Opportunities also exist to improve the existing GO Bus Service on the north side of the CPR line and to work towards establishing a collaborative design with the adjacent proposed fast food/gas station development. **This alternative was therefore carried forward.**

Potential GO Station at Lambs Road (Clarington)

The potential GO Station at Lambs Road was also presented at the first round of public Open Houses in June 2009. The station site was situated on the north side of the CPR line immediately west of Lambs Road. This site was partially located in the floodplain of Soper Creek and is adjacent to watercourse features. Given that this station site was outside of the Clarington urban boundary, it was not favoured by Durham Region because development of such facilities may encourage expansion of urban boundaries. Moreover, the Municipality of Clarington expressed concerns with the bridge over Bowmanville Creek and whether or not it will suffice in carrying additional trains as well as potential noise impacts through the residential area of Bowmanville.

Subsequently, it was suggested to relocate the potential station site on the east side of Lambs Road, to south of the CPR line. However, given the above rationale provided from the municipalities in conjunction with the fact that the Municipality of Clarington did not prefer a layover site on the east side of Lambs Road due to Official Plan designations, **this site was not carried forward for further consideration**.

4.1.2.2 Alterative GO Layover Sites

Similar to the alternative GO Station sites, extensive consultation with respective regulatory agencies/municipalities as outlined in **Chapter 2** of this EPR was received to seek input on alternative layover sites and confirm the recommended transit project as outlined in **Section 4.2** below. Three (3) alternative GO layover sites were presented as alternatives to regulatory agencies and municipalities to confirm/augment the preferred recommended project. A detailed inventory of correspondence received to supplement or alter the preliminary preferred location sites is provided in **Appendix A.** It is noted that regulatory agency/municipal preference given to these sites was considered with respect to provincial/municipal land use planning policies, environmental issues, as well as socio-economic considerations. A brief description of the sites considered and why they were carried forward is described below.

Potential Layover Facility at Prestonvale Road (Clarington)

The potential layover facility at Prestonvale Road was presented at the first round of public Open Houses in June 2009. The layover site was situated north of Baseline Road (north of Highway 401) on the east side of Prestonvale Road, south of the CPR line. Despite the fact that this site is situated within Robinson Creek floodplain and would require a culvert extension if it were developed, **this site was not carried forward** predominately for reasons relating to property/business impacts.

Potential Layover Facility at Rundle Road (Clarington)

The potential layover facility at Rundle Road was also presented at the first round of public Open Houses in June 2009. The layover site was situated on the north side of the CPR line between Solina Road and Rundle Road, immediately south of Baseline Road. As a result of ongoing discussions with respective municipalities and the decision to extend GO Train services to Martin Road, **it was recommended to proceed with this location for the preferred layover facility**. The Municipality of Clarington expressed potential nuisance impact concerns as a result of the passenger trains travelling through Bowmanville, including the structural improvements that would be required over Bowmanville Creek and the proposed land use designations within the other layover sites. It was therefore determined that this site would be best suited for the area.

Although the proposed site was presented to the public in June 2009 as being on the north side of the CPR line, it was later determined that in order to minimize impacts to existing and proposed commercial/industrial land uses within the area, the layover facility should be located on the south side of the CPR line. In addition, CPR indicated that they would generally prefer to have the layover facility on the same side of the right-of-way (ROW) that the GO Train Service is developed on the south side.

Potential Layover Facility at Providence Road (Clarington)

The potential layover facility at Providence Road was also presented at the first round of public Open Houses in June 2009. The layover site was situated on the north side of the CPR line east of Lambs Road and west of Providence Road. Although CLOCA had no environmental concerns with this layover facility site, the Municipality of Clarington preferred another location to this site since they have designated this area for future residential land uses. In addition, it was noted that additional trains running through Bowmanville may raise nuisance concerns with residents and special interest groups in the area and that additional infrastructure requirements (i.e., new bridges) will have to be considered over Bowmanville Creek. **This alternative was therefore not carried forward.**

4.1.2.3 Alternative CNR to CPR Highway 401 Crossings

Three (3) alternatives for the CNR to CPR line track connections to cross Highway 401 were presented at the first round of public Open Houses in June 2009. Details regarding these track connections are outlined below and further illustrated in **Figure 4-4**.

Alternative A Connection:
Being the most westerly track connection of the three, Alternative A is an elevated crossing of Highway 401. It will cross over Corbett Creek and Victoria Street just south of Highway 401 and run parallel to Corbett Creek along the west side, north of Highway 401 as it makes its way up to the CPR line (west of Thornton Road). Construction of this alternative will need to take special care in close proximity to the Corbett Creek. This alternative also creates the need to add one additional track 14 feet south of the existing CPR line in the corridor from the point where the connection track joins the rail corridor up to the east side of Park Road. This additional track on the south side will cross Corbett Creek at the existing culvert crossing of the rail corridor and this will require an extension of this culvert to the north to facilitate the additional track. **This alternative was carried forward for further consideration** primarily because it enabled CPR to continue to use its General Motors (GM) spur line to the south, without potential for future interruptions.

Alternative B Connection:
This crossing was planned to be a subway crossing of Highway 401 and was the approved alternative crossing of Highway 401 in the 1993 EA. The GO Subdivision would turn north from the west end of the existing Oshawa GO Station, through the parking lot, then run in a tunnel under Highway 401 and its service roads, continuing on in open cut until it reached the embankment of the CPR/GM Spur track. The alignment would continue in a tunnel under the GM Spur then run up to the CPR corridor and connect into the existing tracks just to the west of Stevenson Road bridge. It would be necessary at this location to add a new mainline within the CPR corridor 14 feet south of the existing tracks. This additional track would run from this location to east of Park Road. Similar to the other alternatives, the addition of this new track will be on the south side of the corridor and confined to the existing ROW. This alternative would result in significant effort and disruption to Highway 401 traffic for the construction of tunnels including extensive detouring of traffic (in 2 or 3 stages of construction). Furthermore, by going through the existing Oshawa GO Station parking area, it would be extremely difficult and costly to deal with parking arrangements for the two to three year construction period. Other Highway 401 crossing alternatives were far less disruptive. **This alternative was therefore not carried forward for further consideration.**

Alternative C Connection:
This alternative is an elevated crossing of Highway 401, in parallel with and adjacent to the west side of the existing CPR/GM Spur track bridge between Thornton Road and Fox Street. One of the existing GO Subdivision tracks would be extended through the VIA Station platform and raised up to the elevation of the existing CPR/GM Spur track as it approaches Highway 401. The bridge over Highway 401 would be built adjacent to and on the west side of the existing railway bridge and with the same number of spans to achieve the crossing of the various road portions in this area. Once clear of the north side of Highway 401 and its service roads, the new track connection would transition into the existing spur track and the existing spur lead will transition into a new roadbed 14 feet to the east side of the existing spur track.

From this point a new pullback lead would be built on the east side of the existing spur track towards the east until it reaches Stevenson Avenue where it will be connected to the existing alignment through a switch. The new mainline would then follow the existing spur track alignment leading to the east and run into the existing corridor as the spur track does today. It would be necessary to add a new mainline within the CPR corridor 14 feet south of the existing tracks. This additional track would run from this location to east of Park Road. **This alternative was not carried forward for further consideration**, primarily because it had some potential to impact use of the CPR GM Spur line.

Preferred Connection:
Through ongoing consultation with regulatory agencies including respective municipalities, the Ministry of Transportation, CPR, and the public, the three (3) aforementioned connections were presented and it was determined that Alternative A was the preferred crossing. Through additional correspondence with CPR in 2009, it was noted that future GO services along the CPR line must not interfere with the CPR freight service. Under the initial Alternative A Connection drawing in **Figure 4-1**, it was in CPR's opinion that the GM Spur and CPR line would be significantly impacted if GO Transit were to design two (2) mainline tracks and run full service past this area. As a result, it was determined that a rail over rail grade separation was the only solution to ensure no interference between commuter and freight service. To this end, the AECOM Project Team investigated additional CNR to CPR line design crossings, as further described below.

4.2 Description of the Recommended Transit Project

This project consists of two major elements. One is the establishment of a major rail maintenance facility at the west end of the Project Limits. The second element is the extension of GO Train Service on the GO Transit Lakeshore East corridor from Oshawa to Clarington. Both of these elements will enable GO Transit to expand its service on the Lakeshore East corridor and position them to meet the growth in commuter rail service throughout its coverage area with the addition of a second major rail maintenance facility to care for the growth in rail equipment to meet this demand.

4.2.1 East Rail Maintenance Facility

The East Rail Maintenance Facility (ERMF) will be designed to Leadership in Energy and Environmental Design (LEED) standards by utilizing environmentally friendly building practices during design and construction. This facility will be developed to significantly increase GO Transit's ability to handle the rail equipment maintenance requirements for the future. Initially GO Transit established one such rail equipment maintenance facility in Etobicoke. With the present and future plans for expansion of the GO train system, it is now necessary to establish a second maintenance facility. The location of this site enables GO Transit to develop a balanced approach to rail equipment maintenance. In addition, GO Transit will be in a better position to manage the regulated inspections and maintenance on the entire train fleet once these two facilities are in operation.

This facility will cover approximately 30 ha of land and will employ approximately 300 people in many types of work from heavy mechanics to cleaning staff to train operators and other types of work. The design of this facility will enable GO Transit to rebuild its engines and coaches, paint its equipment, wash its equipment on a regular basis, undertake regulated inspections and light maintenance and repair, and repair and replace train wheels. The facility will have stores for supplies and office space for the management of this facility. Trains will be fuelled here and approximately 18, 12-car train sets will be able to be stored here and put onto electrical land lines and turned off when not in use. From this rail yard, locomotives will be started and the trains sent into revenue service. This will enable train operators or crews to start and end their day from the crew center in this facility (see **Figure 4-3**).

The rail infrastructure to support all of this activity will stretch from Victoria Road in the west to Thickson Road in the east. As part of the design for this facility, GO Transit has undertaken measures to provide a rail/road grade separation at South Blair Road. This railway bridge will accommodate the entire existing track requirements across this road as well as two (2) tracks associated with this facility's rail yard. The new grade separation at South Blair Road will improve existing conditions and eliminate the need for train whistles at the current at grade crossing. In addition the preferred plan includes removing the existing structure on Hopkins Street (over the existing rail line) and building a new access road to the existing businesses at the end of the street. The new access point will require a laneway to be constructed that connects the business area with South Blair Road, south of the rail maintenance facility site and rail corridor. GO Transit is working closely with the Region of Durham and the Town of Whitby to make sure the proposed road connections are compatible with the local road network and land uses in the immediate vicinity and designed to meet municipal standards. If during detailed design additional land is required for any aspect of this facility and its road impacts, GO Transit will work with the land owners affected to resolve the matter satisfactorily.

The rail maintenance facility site will be re-graded to enable the train yard to be built below the entrance points in a dished fashion. This will allow the safety feature of ensuring the rail equipment will be contained within the facility and the buildings can be established at much the same level so the rail equipment can access them as required. Storm water management impacts and mitigation is detailed in **Section 4.4.1.1**.

4.2.2 Train Service Extension to Clarington

To meet the requirements of extending GO Train Service to Clarington, additional track capacity will be necessary at each step of train service growth. The initial train service extension plan will consist of running full daily train service to the Ritson Road GO Station site and then extending the peak hour trains further out to the Martin Road GO Station site. This will generally require two (2) tracks worth of capacity to handle the full service plan with one (1) track worth of capacity over the remaining section as shown in **Figure 4-2** (Phase 1). As further illustrated in **Figure 4-2**, Phase II will be implemented at such a time when full service to Bowmanville is warranted. This capacity need will be over and above the existing amount of track capacity within the CPR corridor. A second condition is that by design the freight and commuter train service must not interfere with each other during their normal operation. In this way, the trackage within the CPR corridor will be delineated so that the tracks to the north of the track infrastructure will be used primarily by freight train service and the tracks to the south will be used primarily by the commuter rail service.

4.2.3 Full Train Service Requirement to Ritson Road GO Station Site

To achieve this service plan, GO Transit plans to terminate its train service operation at the existing Oshawa GO Station and relocate it to the new full service terminus station at Ritson Road on the north CP Rail corridor. Two (2) tracks will turn to the north and rise up to cross over the fully planned Victoria Road then over the truck inspection Highway 401 entrance ramp and the Thickson Road Highway 401 entrance ramp. At Highway 401 the double track will continue over the fully planned expanded Highway 401 and Consumers Road to then run along the ridge to the west of Corbett Creek. This double mainline will then cross over the planned Champlain Avenue as it turns to the east through the open fields to pass through the new line point GO Station west of Thornton Rd. and passes under Thornton Road leaving the road profile as it is today (see **Figure 4-6**).

These two (2) tracks will pass between two (2) hydro pylons well below clearance requirements as they approach the CPR/GM Spur at the apex of the Wye configuration. Once these two (2) tracks have passed under the GM Spur, they will then rise to ground level and enter the CPR corridor just to the west of the Stevenson Road overhead bridge. Once within the CPR corridor, these two (2) tracks will pass under the Stevenson Road and Park Road overhead bridges along the south side of the rail corridor adjacent to the existing tracks in the corridor. In addition, the CPR mainline and passing track will be moved north by one (1) track center until they approach the Oshawa Creek bridge. At this location the CPR mainline will return to its original alignment and the two (2) GO Transit tracks will resolve into one (1) track.

The railway bridge over Oshawa Creek will be expanded by one (1) track along the south side of the existing bridge. Between the Oshawa Creek railway bridge and the east side of the Ritson Road GO Station site, one (1) additional track will be built along the south side of the existing track. Through the Ritson Road GO Station site, this second mainline will remain next to the existing mainline. Immediately east of Albert Street, a station track will be built to the south of the new commuter rail track and will divert to the south away from the other tracks to establish an island platform between these tracks where the Ritson Street GO Station will be established. This station track will extend from Albert Street to west of Wilson Street and serve as a staging track for the full train service arriving and departing from this station.

The development of the double mainline over Highway 401 and through the field then under the GM Spur before entering the CPR corridor will facilitate the separation of freight and commuter train service. CPR freight service will operate on the northern side of the track structure and will not be affected by the movements of the commuter service. As the CPR freight service needs to access and egress the GM Spur, the commuter service will pass under their activities and not impact their service to the GM complex south of the CNR corridor. For the rest of the CPR corridor the plan of freight activities to the north side of the track infrastructure and commuter service to the south, will continue and in this way ensure that neither train service will conflict with the other over this territory.

Plans and profiles of the proposed track work (i.e., twinning) are contained in **Appendix H.**

4.2.4 Peak Train Service to Clarington

Between the Ritson Road GO Station site and the Martin Road GO Station site, one (1) additional track will be built to meet the condition of having the two (2) train services separated and not in conflict with each other. To achieve this and to protect this plan, tracks will generally be built to the south side of the existing CPR line. A new station will be established at Courtice Road and a terminus station in Bowmanville at the intersection of County Road 57 and the CPR corridor. This terminus station and tail track back to the east side of Highway #2 Bridge (King Rd) will be the end of additional track building for this peak period of service. In the future as full service plans are warranted, a second new track will be required from the Ritson Road GO Station site to the Martin Road GO Station site to accommodate the extension of full daily train service to Bowmanville (see **Figure 4-2**, Phase II).

The extension of GO Train Service to Clarington also requires the establishment of a train layover site near the end of service, to park trains overnight and facilitate minor maintenance. This project has selected a site adjacent to the rail corridor between Solina Road and Rundle Road. It is planned that this site will start out with rail infrastructure to store four (4) or five (5) trains overnight to meet the initial peak period service plan to start service from the Martin Road GO Station site. To provide enough track capacity to move trains between this layover site and the end of service terminus at Bowmanville at the same time as revenue train service runs between Bowmanville and Union Station, a service track will need to be provided to link these two (2) sites. This will add a second new track between these two (2) sites.

Within the CPR corridor, the additional roadbed for new track will generally be built adjacent and contiguous to the existing CPR track bed. As this construction crosses various watercourses, the existing culverts and bridges will be extended in kind by approximately 25 feet to accommodate the roadbed and eventual track system. As required by CLOCA, MNR and DFO, GO Transit will provide the required details for each watercourse crossing and obtain appropriate approvals were required to proceed.

4.2.5 GO Train Stations

The extension of GO Train Service from Oshawa to Bowmanville will be developed with the associated four (4) new GO Train Stations to be opened upon the opening of this new extended train service. In addition, one (1) potential future GO Train Station is proposed to be opened when demand warrants the need for the additional station. Each station location was selected to provide communities (i.e., Whitby, Oshawa and Bowmanville) with a convenient point of connection with the GO train system. Site locations were selected to balance the service to the present and future communities and enable greater linkages between transit systems which will ensure greater possibility for people to use transit to their advantage and link directly and easily to the rest of the Greater Toronto Hamilton Area (GTHA) through the services of GO Transit. Each station will provide grade separated pedestrian access to the train platform and will enable full accessibility flow between the station grounds and the trains, following the accessibility policy of GO Transit.

In general, each of the four (4) station sites selected will not directly impact watercourses within the area although they will require paved parking lots for their parking patrons, station facilities, walkways and station platforms. The proposed works include storm water management and drainage facilities to ensure that runoff is properly managed. It is noted that during detail design, storm water issues will be addressed within the LEED design work.

4.2.5.1 Thornton Road GO Station Site (Thornton's Corners)

The proposed Thornton Road GO Station, referred to as Thornton's Corners was not considered during the 2009 Feasibility Study. The Town of Whitby recommended that this site be considered as part of this EA given that Consumers Drive will be extended through this area. Whitby planning staff felt that connecting the eastern portion of Whitby and the western portion of the City of Oshawa could provide better service.

This station site is located on Thornton Road just south of the CPR rail corridor. With the establishment of this station, GO Transit will relocate its present Oshawa Station services to this location. This new station will provide a full train service for users from the western portion of Oshawa and the eastern portion of Whitby. Parking will be comparable to that presently supplied at Oshawa GO Station and will offer approximately 1,525 parking spaces with opportunities for future parking expansion to the west of the proposed parking lot. The GO Station will also provide bike shelters, a bus loop and handicapped parking spaces adjacent to the station building. Transit service will be provided along with "Kiss and Ride" capacity. Over time, this station will be serviced by the extension of Consumers Drive from the west and will enable greater service to the area (see **Figure 4-5**).

The existing Oshawa GO Station on the south side of Highway 401 will be phased out of service when the new stations are built. The existing station will remain as a VIA Station south of Highway 401.

4.2.5.2 Ritson Road GO Station Site (Oshawa GO Station NEW)

Located just south of the center of Oshawa, this station will be referred to as Oshawa GO Station (NEW) will enable the city to develop an increasing series of linkages between the GO train system and other forms of transit serving the city. The proximity of this station to downtown Oshawa has some potential to stimulate redevelopment of the general area.

This station will utilize the former rail yard property north of the operated CPR corridor between Front Street and Ritson Road. This north portion of the station grounds will facilitate access from the Gibb/Olive roadway and provide initial bus access to the station along with "Kiss and Ride" facilities and some parking. On the south side of the tracks, GO Transit plans to transform the old Knob Hill Farms site into its station facility including the majority of parking and some "Kiss and Ride" facilities. There will be approximately 1,228 parking spaces on the south side with opportunities for future parking expansion on the east side of the property (see **Figure 4-6**).

GO Transit plans to work with the City in preserving the oldest building façade section along Front Street as a preservation of a part of the City's history in this area. This station will include a center island platform between the station track and the new mainline. GO Transit proposes to install two (2) pedestrian tunnels at this station. One (1) will be along the alignment of Front Street and provide dual capacity of enabling pedestrians to continue to use the pedestrian walkway along Front Street and also enable riders to access the west end of the GO Platform and the GO System. The second tunnel will facilitate access to the island platform from the station grounds and enable patrons with accessibility requirements to move easily between the trains and the parking and bussing areas of this station.

4.2.5.3 Bloor Street Station Site (Grandview GO Station)

This station site, referred to as Grandview GO Station, has been identified as a future potential station that will be developed when the other stations (i.e., Thornton's Corners and Oshawa NEW) are at or over capacity. It is identified as part of this EA as a future long-term option. Additional studies on addressing impacts of construction at this site will be carried out prior to construction.

4.2.5.4 Courtice Road GO Station Site (Darlington GO Station)

This station site, referred to as Darlington GO Station, is located between the main downtown areas of Oshawa and Bowmanville in an area that is planned to develop over the next few years and with direct access to Highway 401. As many riders of the GO system come from communities farther to the east, this station will provide them with a convenient and direct access point to the system. It will enable riders from the east to utilize Highway 401 to this point and give them direct access to this station location and entrance to the GO train system. The main station facilities will be located to the north of the CPR corridor. This will include a station building and parking facilities along with a bus access point and "Kiss and Ride" facilities. At track side GO Transit will install a pedestrian tunnel to access a south side Station platform. Parking facilities include 1,100 spaces with opportunities for future parking expansion to the west of the proposed parking lot. Initially this will be a side platform but as train service grows and full service develops this platform will expand into an island platform to service two way train traffic along the south side of the corridor (see **Figure 4-7**).

4.2.5.5 Martin Road GO Station Site (Bowmanville GO Station)

At present this station consists of a GO bus terminal on the north side of the rail corridor, which services GO ridership and provides GO patrons with bus service to the GO train system at the present terminus in Oshawa. With the extension of train service this station will be redeveloped into both a train and transit hub for both the GO System and local transit. It will be referred to as the Bowmanville GO Station. On the north side of the corridor, GO Transit will redevelop the land to accommodate a bus terminal along with a "Kiss and Ride" facility and 80 parking spaces. This bus terminal will enable municipal and regional transit to access the train station and interchange patrons at the facility.

On the south side of the rail corridor GO Transit will develop a large parking facility along with "Kiss and Ride" features and expansion capability as the demand at this terminus station grows. This station will initially provide a south side island platform between the mainline and the south service track. As train service grows into full service the south service track will be upgraded into a south mainline. GO Transit will work with the community to ensure that general pedestrian crossing of the rail corridor will be directed safely across its grade separated pedestrian crossing. Within the southern portion of the station site, there will be an additional 770 parking spaces (see **Figure 4-8**).

4.2.6 Rundle Road Layover Facility Site

The train layover site recommended for this extension of train service sits adjacent to the CPR corridor along the south side between Rundle Road and Solina Road. It will initially be developed to provide for five (5) 12-car GO Trains to be parked. Each train will be stored in the layover and plugged into electrical service and the engines will be turned off when the train is in storage. Each morning the trains will be started up and warmed prior to being put into service. From this location these trains will normally move east to the Bowmanville GO Station site to begin revenue service into Union Station. At the end of the day trains will return patrons to Bowmanville in revenue service and upon completion of this service, move as equipment service back to the Rundle Road Layover Facility site. During the initial service plan these trains will be given light maintenance at this site. The cleaning up of garbage, some cleaning of the interior of the train as needed, some light replacement of parts etc. will be handled at this site. Train fuelling will also be provided at this facility.

As train service expands, this facility will fill out to its full plan, with a layover capable of handling eight (8) trains for storage. In addition, a Progressive Maintenance (PM) building capable of housing two (2) 12-car trains and engine side by side inside may be added. This PM Bay will provide the ability to undertake regulatory inspections of each train as required. As a result of these regulatory inspections some minor maintenance, fuelling and repair will be undertaken.

This will also enable other quick repairs to be undertaken during the same inspection period. As GO Transit train service grows throughout the system, it will become increasingly difficult to cycle equipment sets to major maintenance facilities for the required regulatory inspections. Therefore GO Transit has planned that all of its layover facilities will have the capability to undertake these inspections on the required frequencies and follow up with the immediate light repairs required. Should more demanding and time consuming repairs be required then the trains will be moved to the main repair shops for this work to be undertaken (see **Figure 4-9**).

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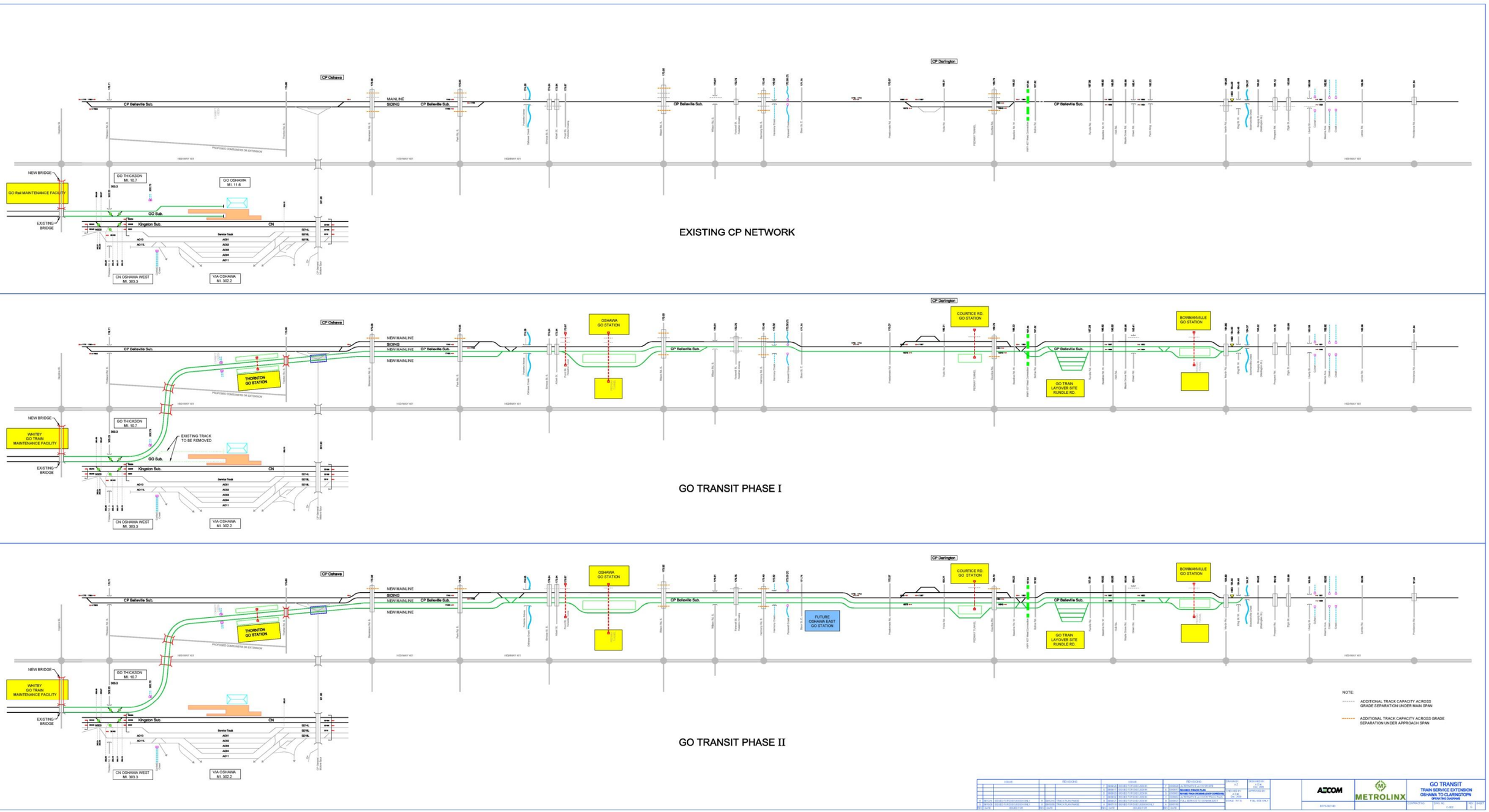
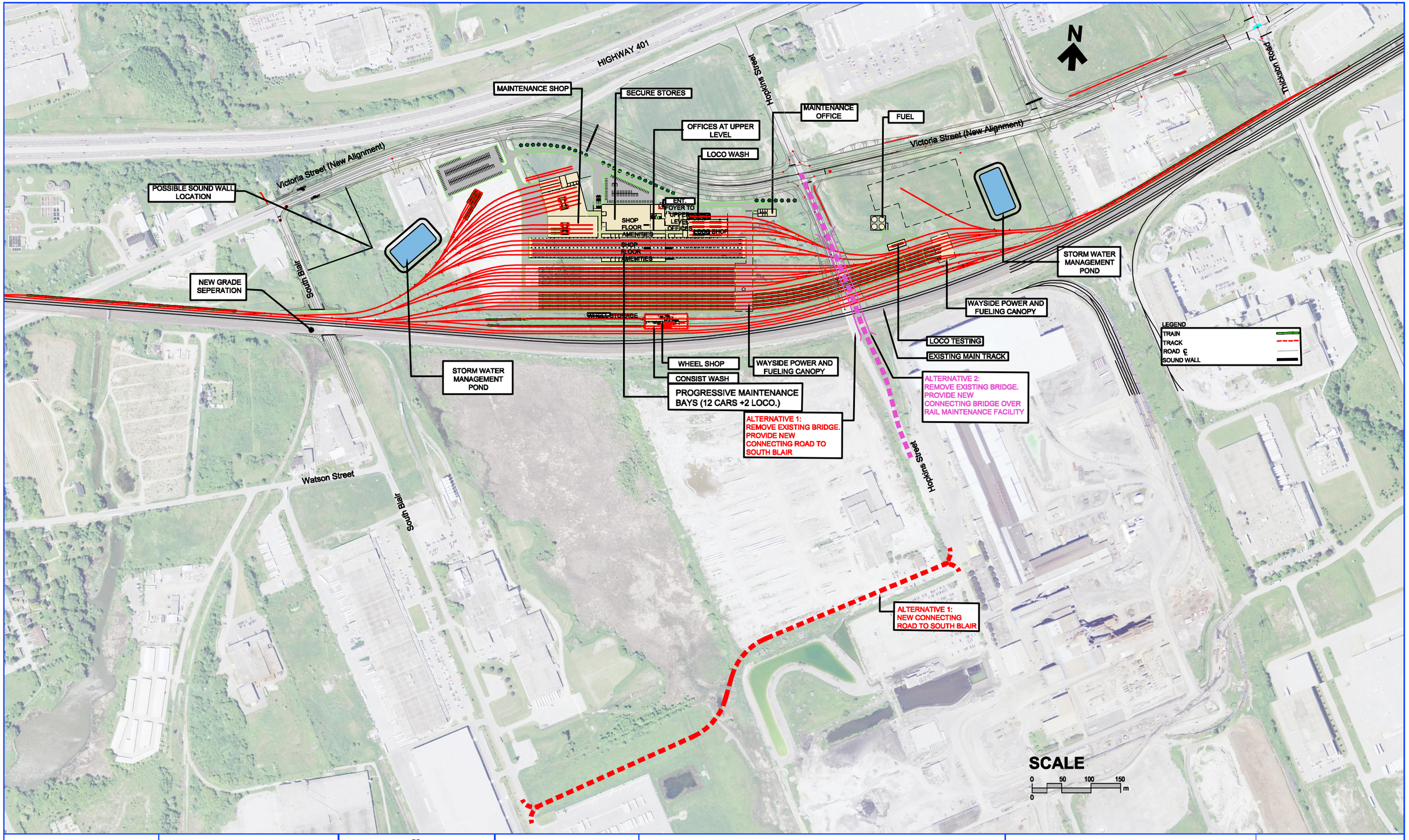
Figure 4-2 Existing and Future CPR Track Layout





METROLINX
CORPORATE INFRASTRUCTURE

AECOM

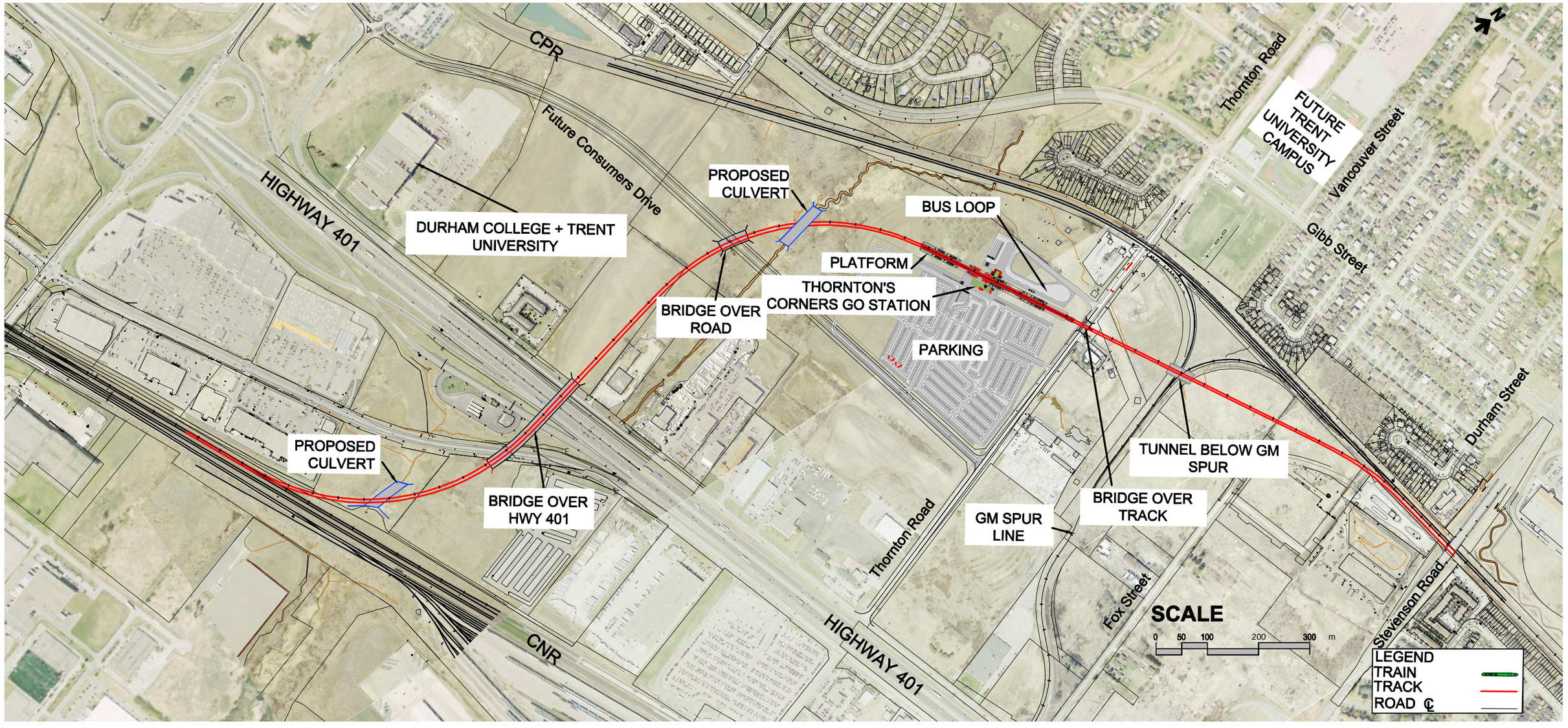
GO TRANSIT EXPANSION ENVIRONMENTAL ASSESSMENT AND PRELIMINARY DESIGN
Lakeshore East Service extension to Clarington and Whitby
Rail Maintenance Facility

Proposed Whitby Rail Maintenance Facility Site

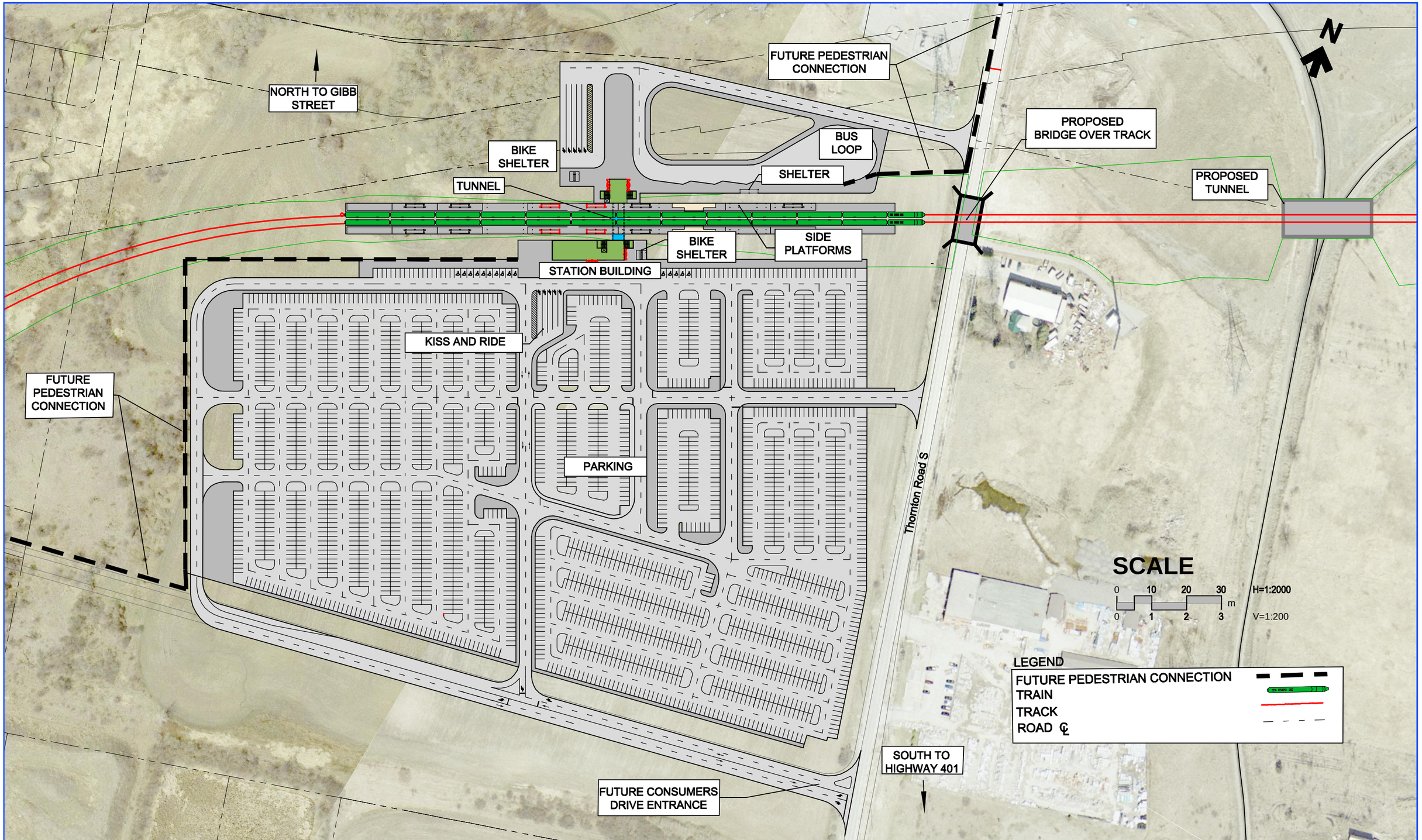
PROJECT NUMBER
E073-061-00

DRAWING NUMBER
Figure 4.3

PLATE
RMF-01



			AECOM	GO TRANSIT EXPANSION ENVIRONMENTAL ASSESSMENT AND PRELIMINARY DESIGN Lakeshore East Train Service Extension To Clarington & Whitby Rail Maintenance Facility	Proposed CNR to CPR Crossing Site PROJECT NUMBER 60115182 · DRAWING NUMBER Figure 4.4	10/07/15 PLATE CON-01



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GO TRANSIT EXPANSION ENVIRONMENTAL ASSESSMENT AND PRELIMINARY DESIGN
Lakeshore East Service extension to Clarington and Whitby Rail Maintenance Facility

Proposed Thornton Road GO Station Site - Thornton's Corners GO Station

PROJECT NUMBER: E073-067-00

DRAWING NUMBER: Figure 4.5

PLATE: STA-01

NORTH TO OLIVE AVENUE

Fisher Street

PEDESTRIAN TUNNEL

SHELTER

BUS LOOP

SHELTER

PREFERRED PARKING

KISS AND RIDE

BIKE SHELTER

FUTURE PEDESTRIAN CONNECTION

STATION BUILDING

BIKE SHELTER

TUNNEL

Drew Street

George Street

Ritson Road S

Edward Avenue

Front Street

KISS AND RIDE

Albert Street

ny Street

ET

PARKING

(HERITAGE BUILDING) HATCHED PORTION OF EXISTING BUILDING AND FACADE TO BE RETAINED

EXISTING BUILDING TO BE DEMOLISHED

FUTURE PARKING EXPANSION

Graburn Avenue

LEGEND

FUTURE PEDESTRIAN CONNECTION

TRAIN

BUSES

TRACK

ROAD ℄

RITSON ROAD S.

Beatty Avenue

SCALE

0 10 20 30 m

0 1 2 3

SOUTH TO

METROLINX

CORPORATE INFRASTRUCTURE

AECOM

GO TRANSIT EXPANSION ENVIRONMENTAL ASSESSMENT AND PRELIMINARY DESIGN

Lakeshore East Service extension to Clarington and Whitby Rail Maintenance Facility

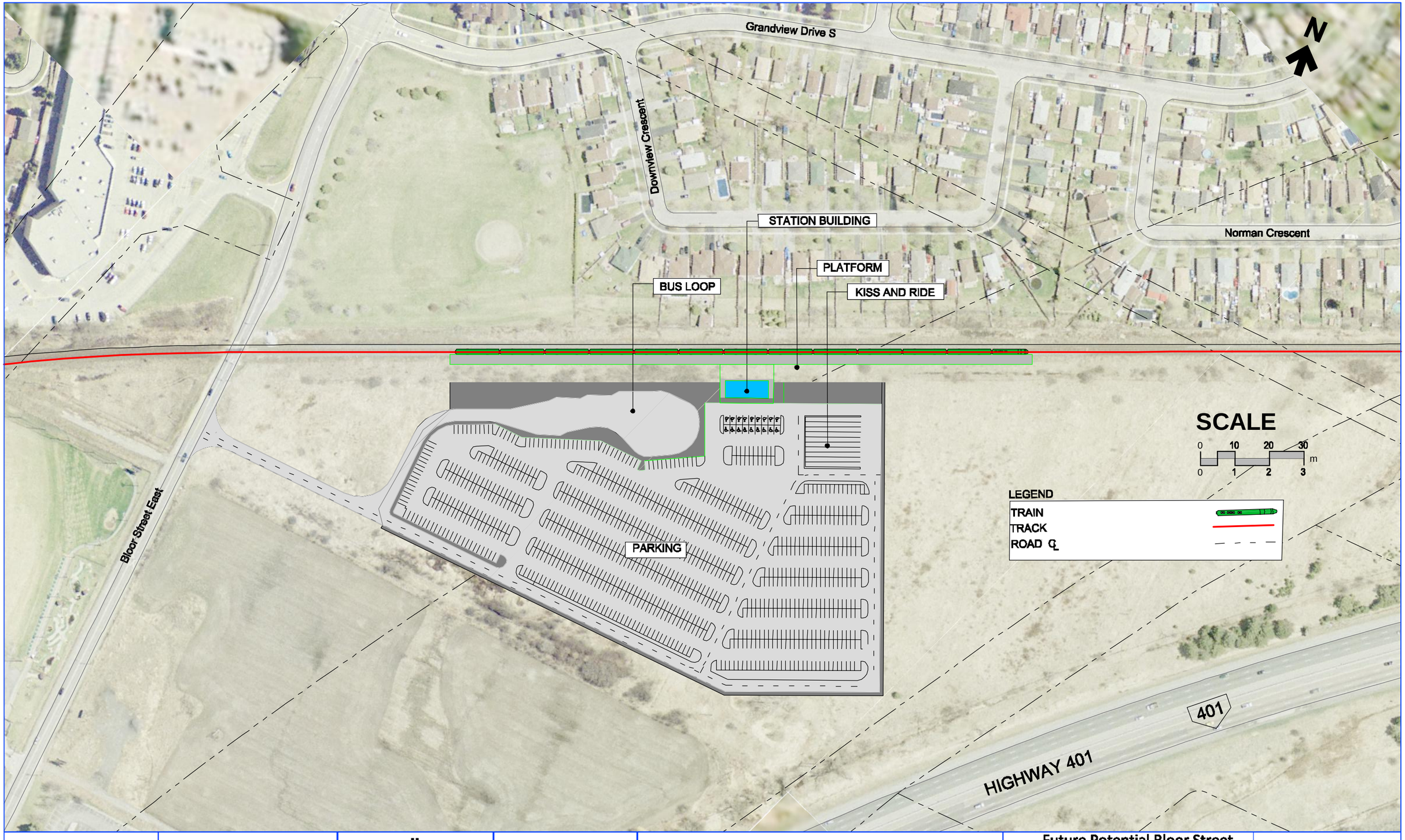
Proposed Ritson Road GO Station Site - Oshawa GO Station

PROJECT NUMBER E073-067-00

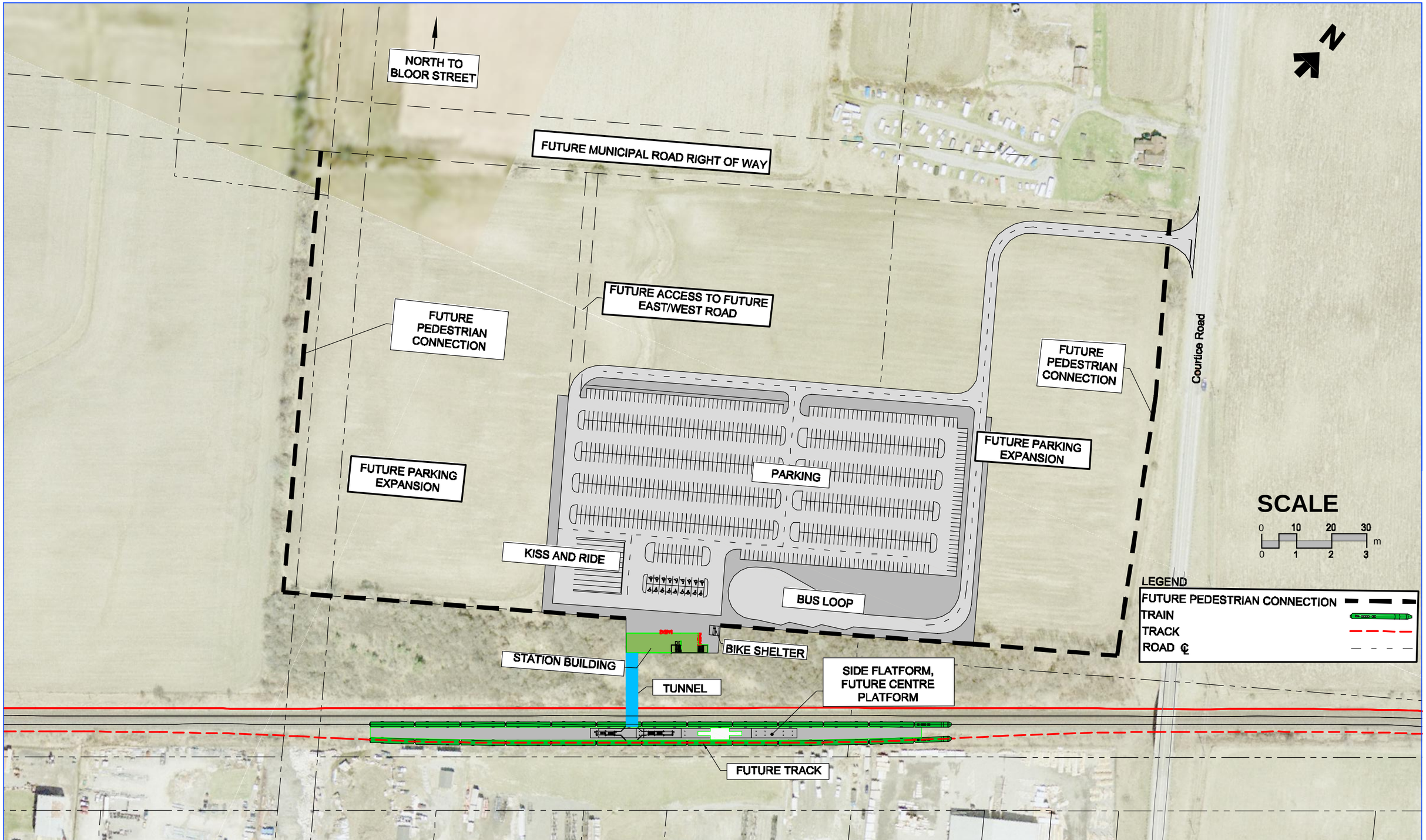
DRAWING NUMBER Figure 4.6

PLATE

STA-02



		METROLINX CORPORATE INFRASTRUCTURE	AECOM	**GO TRANSIT EXPANSION ENVIRONMENTAL ASSESSMENT AND PRELIMINARY DESIGN** **Lakeshore East Service extension to Clarington and Whitby Rail Maintenance Facility**	Future Potential Bloor Street GO Station Site - Grandview GO Station PROJECT NUMBER: E073-067-00 DRAWING NUMBER: Figure 4.7	PLATE **STA-03**



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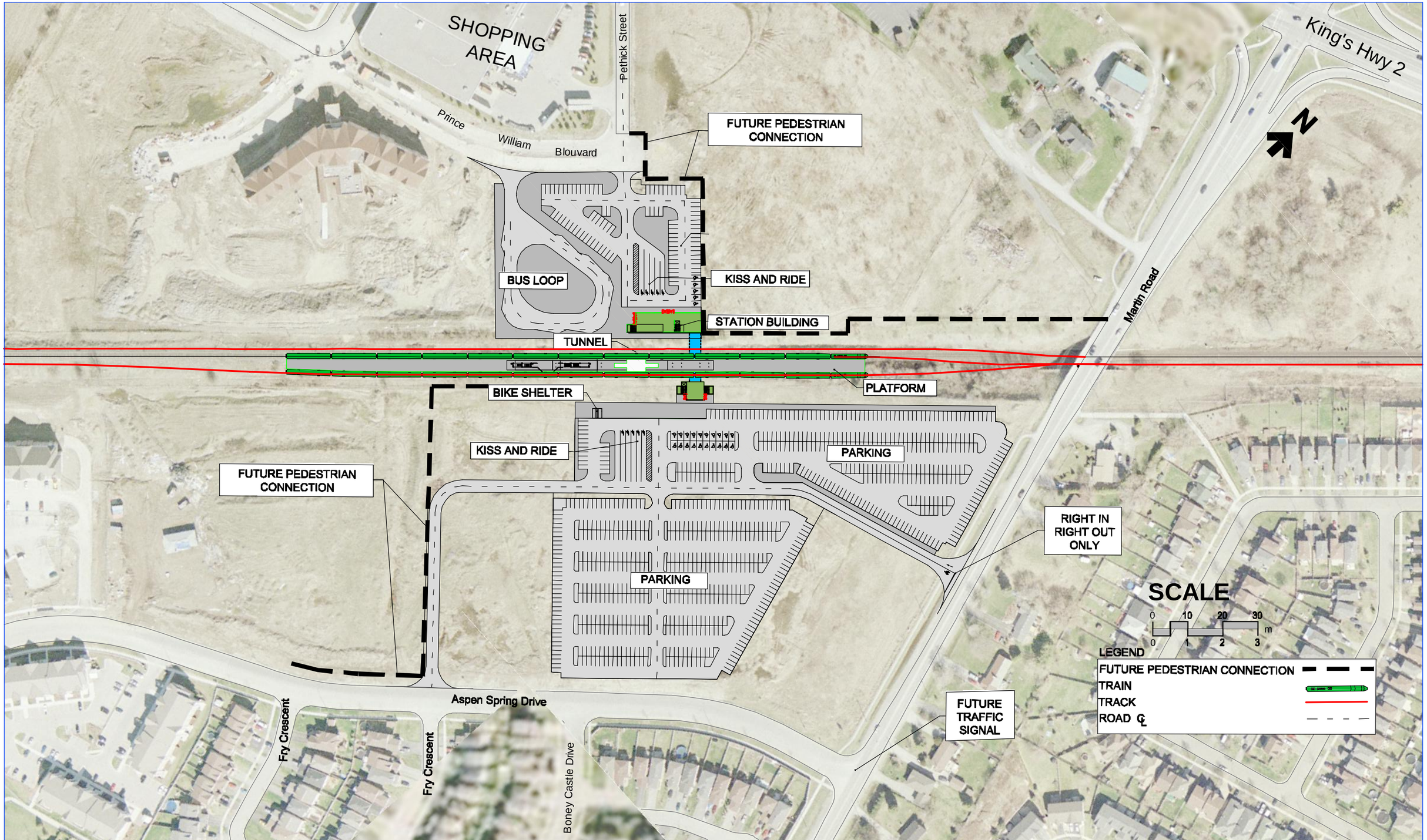
GO TRANSIT EXPANSION ENVIRONMENTAL ASSESSMENT AND PRELIMINARY DESIGN
Lakeshore East Service extension to Clarington and Whitby Rail Maintenance Facility

Proposed Courtice Road GO Station Site - Darlington GO Station

PROJECT NUMBER
E073-067-00

DRAWING NUMBER
Figure 4.8

PLATE
STA-04



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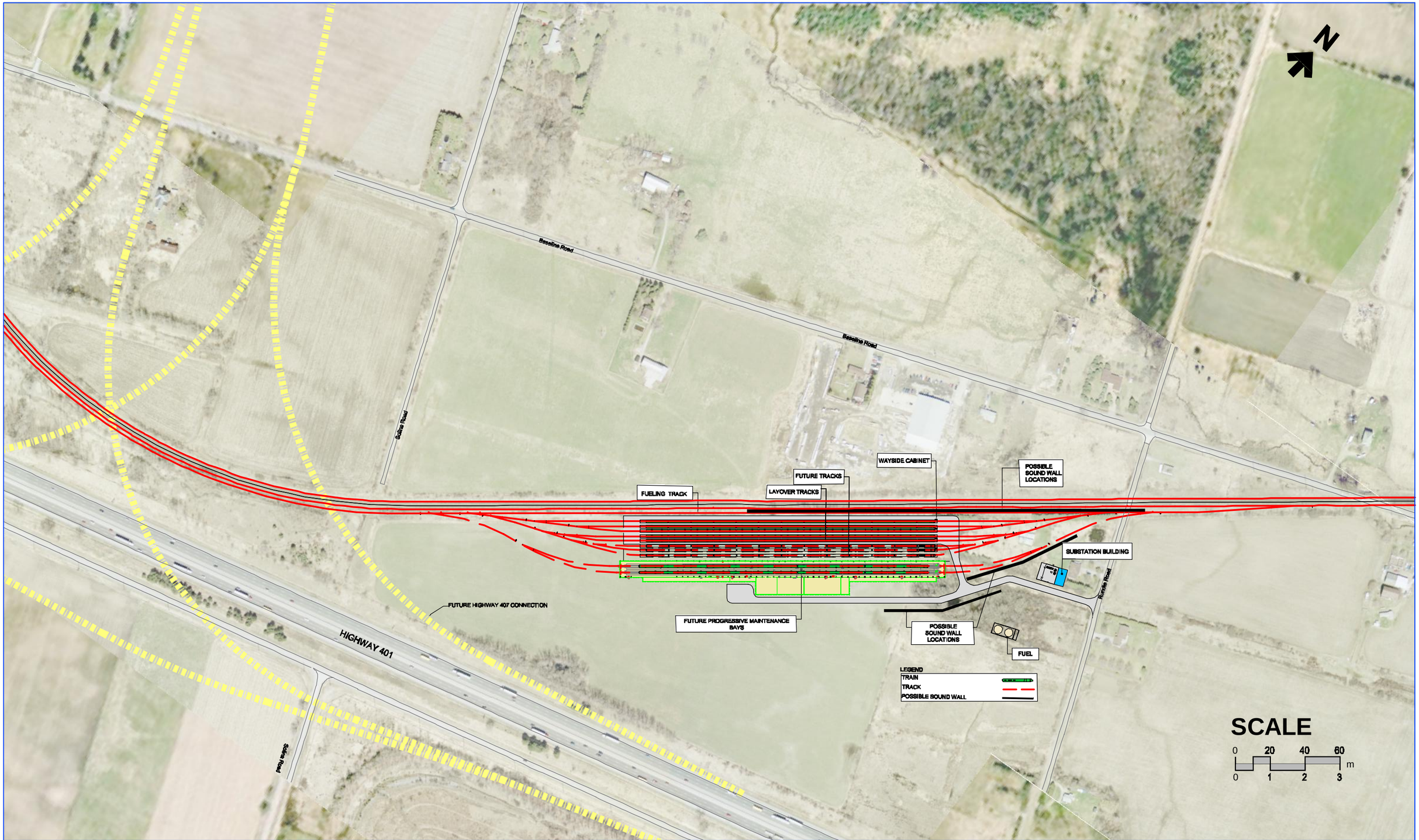
GO TRANSIT EXPANSION ENVIRONMENTAL ASSESSMENT AND PRELIMINARY DESIGN
Lakeshore East Service extension to Clarington and Whitby
Rail Maintenance Facility

Proposed Martin Road GO Station Site - Bowmanville GO Station

PROJECT NUMBER E073-067-00

DRAWING NUMBER Figure 4.9

PLATE
STA-05



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AECOM

GO TRANSIT EXPANSION ENVIRONMENTAL ASSESSMENT AND PRELIMINARY DESIGN

Lakeshore East Service extension to Clarington and Whitby

Rail Maintenance Facility

Proposed Rundle Road Layover Facility Site

PROJECT NUMBER
E073-067-00

DRAWING NUMBER
Figure 4.10

PLATE
TLF-01

4.2.7 Structural Improvements

Given that the above noted facilities and the track twinning will traverse several municipal roads and watercourse crossings, some improvements to the existing bridges within the Project Limits are required to facilitate additional train movement without interrupting the existing CPR freight services. In addition, some structural improvements in the form of concrete box/arch culverts are required over watercourse crossings, including the Corbett Creek Floodplain, which is situated within those lands proposed for the CNR to CPR line crossing over Highway 401. A list of these structural improvements is provided in **Table 4.4** below.

Table 4.4 Proposed Structural Improvements within the Project Limits

Location	Mileage	Type of Spanning	Structural Work Required
South Blair Street/CNR Corridor	GO 9.61	8 track railway bridge over proposed 4 lane road (separate study)	New rail over road passing for 8 tracks
Hopkins Road/CNR Corridor *	GO 10.13	2 lane road over 20 tracks	Expansion over 20 proposed tracks for the ERMF
* NOTE THIS IS A SECOND (BACK UP) OPTION IF ROAD TO SOUTH BLAIR CANNOT BE CONSTRUCTED SOUTH OF ERMF			
Box Culvert	GO 11.18	2 track double box culvert – twin Conspan (or equivalent) structure 11 m span by 3.4 m rise	Concrete box culvert for Corbett Creek water passage south of Victoria Street
Highway 401 Crossing	GO Ext. 11.30	2 track railway bridge over Victoria Street, ramps, Highway 401, and Champlain Avenue	Structural bridge span will be approximately 360 m long and is to be consistent with MTO regulations
Future Consumers Road/Future CNR to CPR Crossing	GO Ext. 11.69	2 track railway bridge over road	4 lane span approximately 20 m long
Box Culvert	GO Ext. 11.72	1 Conspan structure (or equivalent) 9.8m span and 2.5 m rise	Concrete box culvert for Corbett Creek water passage west of Thornton Road
Thornton Road/Future CNR to CPR Crossing	GO Ext. 12.16	4 lane road bridge over 2 new track roadbed	New road bridge 4 lanes approximately 20 m wide x 12 m long
GM Spur Line/Future CNR to CPR Crossing	GO Ext. 12.29	1 track railway bridge carrying GM Spur track over 2 track roadbed	To be defined
Stevenson Road/CPR Crossing	CP 175.08	Retaining wall – 3 tracks under middle span and 1 track under south span using retaining wall	Retaining wall to protect south abutment
Park Road/CPR Crossing	CP 174.55	Retaining wall – 3 tracks under middle span and 1 track under south span using retaining wall	Retaining wall to protect south abutment
Oshawa Creek/CPR Crossing	CP 174.28	Add 1 railway bridge on south side of existing bridge	Expand existing one track to south
Simcoe Street/CPR Crossing	CP 174.04	Add 1 track under road south of existing CPR line	None
Albert Street/CPR Crossing	CP 173.94	Add 1 track under road south of existing CPR line	None
Ritson Road/CPR Crossing	CP 173.52	Add 1 track under road, north & south of existing CPR line	None
Wilson Road/CPR Corridor	CP 173.01	Use track deck on north side by track shift (rail over road)	None
Farewell Street Pedestrian Bridge/CPR Corridor	CP 172.75	Build new pedestrian overhead bridge to accommodate 4 tracks	New pedestrian bridge for 100 ft over rail corridor
Harmony Road/CPR Corridor	CP 172.49	Road over rail – run tracks through middle spans	None
Harmony Creek Track Bridge/CPR Crossing	CP 172.32	Add 1 bridge on the north side of existing bridge	Expand existing one track to north
Farewell Creek Track Bridge/CPR Crossing	CP 172.00	Add one track extension on south side of existing box culvert (old bridge replaced)	Expand existing one track to south
Robinson Creek/CPR Crossing	CP169.84	Add 20 feet extension of concrete arch culvert to north d	Expand existing one track to north
Courtice Road/CPR Crossing	CP 168.79	Road over rail - add 1 track under main span south side	None
Tooley Creek/CPR Crossing	CP 168.61	20 feet extension of concrete arch culvert to north	Expand existing one track to north
Darlington Creek/CPR Crossing	CP 166.73	20 feet extension of concrete arch culvert to north & south	Expand existing one track to north & south
Darlington Creek/CPR Crossing	CP 166.52	20 feet extension of concrete arch culvert to north & south	Expand existing one track to north & south
Darlington Creek/CPR Crossing	CP 166.31	20 feet extension of concrete arch culvert to north & south	Expand existing one track to north & south
Green Road Trestle/CPR Crossing	CP 165.41	Others to rebuild to protect for four tracks (1 north, 2 south of existing)	None
East of Green Road Trestle/CPR Crossing	CP 165.24	Extend 1 track trestle	Propose to fill in this span and remove bridge

4.2.8 Corbett Creek Watershed Flood Study

Given that the proposed Highway 401 CNR to CPR crossing site will traverse Corbett Creek, within its floodplain, the study included a Corbett Creek Watershed Flood Study (see **Appendix C**). As noted therein, the proposed connecting track will extend from the CNR corridor east of Thickson Road to the CPR corridor west of Stevenson Road. A single large bridge will carry the connecting track over Victoria Street and Highway 401. The connecting track will also traverse the future Consumers Drive, Thornton Road and the CPR spur line east of Thornton Road.

The proposed alignment crosses Corbett Creek at three (3) different locations; the first (and most significant) is the crossing south of Victoria Street, which is mostly within the regional storm floodplain. The second crossing is located north of Victoria Street and does not warrant any analysis as it is located under the proposed bridge to that will carry the

tracks over Victoria Street and Highway 401. The third crossing occurs west of Thornton Road and north of the future Consumers Drive extension (AECOM, 2010).

In order to prevent the proposed GO connecting track from becoming a restriction to flow in the event that the existing CNR culvert is enlarged, two (2) +/- 11 m Conspan or equivalent culverts are recommended for the proposed south Corbett Creek crossing south of Highway 401.

The proposed connecting track between the CNR corridor and Victoria Street will require 60,000 m³ to 90,000 m³ of fill in the regional storm floodplain for the embankment, depending on the steepness of the embankment side slopes. This fill volume has the potential to increase 100 year storm flood levels by 0.3 m to 0.45 m, and to increase regional storm flood levels by 0.2 m to 0.3 m. The impact on flood levels can be mitigated if steeper 1H:1V side slopes are used for the embankment, and the floodplain on both the east and west sides of Corbett Creek are regraded to create 60,000 m³ of offsetting flood storage.

The second East Corbett Creek crossing is located immediately north of Victoria Street. A continuous bridge is proposed to cross over Victoria Street, East Corbett Creek and Highway 401. No impacts on flooding in East Corbett Creek are anticipated (AECOM, 2010).

The final crossing of East Corbett Creek occurs between the future Consumers Drive extension and the CPR corridor west of Thornton Road. A 9.75 m Conspan or equivalent culvert is recommended at this location to prevent any impacts on upstream flooding. A more detailed discussion of the results to the Flood Study are included in **Appendix C** of this report.

It should be noted that during detailed design, the Flood Plain Mapping and flood storage areas will be refined and presented on full size drawing plates. Plans for a one year monitoring water quality program (prior, during and post construction) will also be prepared at the detailed design stage, and monitoring locations will be indicated on the drawing plates.

4.3 Implementation and Construction Staging

4.3.1 Implementation

With the approval of this EA, GO Transit will proceed to seek the required funding from the provincial government to undertake the proposed works. When funding is secured, the next step will be to begin the detail design of the many elements of this project. GO Transit will continue to consult with municipalities, agencies and property owners directly affected by the project during detail design regarding several aspects of the final design including additional land requirements temporarily and permanently, mitigation of impacts at watercourses or other sensitive areas, drainage and storm water management, traffic management (long-term and during construction), construction staging, communications with public and other approvals that may be required (i.e., DFO, Navigable Waters, Canadian Transportation Agency, etc.). Commitments to address all outstanding issues are described in greater detail in the following sections.

4.3.2 Construction Staging Overview

It is recognized that the construction timing for some of the key elements of this project will require significant time to complete. It is anticipated that the contract for the GO Transit ERMF will start early in the project (i.e., detail design to start in 2011) and take approximately three (3) years to complete construction. As it is a standalone element it is expected that the completion of this work will finish well before the introduction of the new train service extension to Clarington.

Of the other main project elements, it is expected that building of the new double track roadbed between the GO Transit corridor and the CPR corridor will be initiated first with the associated bridges built in order. Within the CPR corridor, roadbed grading may start in Bowmanville and work its way towards Oshawa since no significant structures are encountered until Farewell and Harmony Creek crossings. The rail carrying structure that needs to be built will have to be in advance of the grading activity.

The GO Stations will also need to be initiated as they are complex to develop with buildings, pedestrian tunnels, station platforms with enclosures and canopies on them. Parking facilities and other road works at each station can be coordinated with municipal needs and completed as the stations are completed. Similarly the Layover Facility at Rundle Road will have to be graded and track built to hold the initial five (5) trains along with the fuelling depot and temporary office set up.

Once the roadbed and bridges are complete and the station elements around the roadbed are finished, the track construction can commence and the railway Central Traffic Control System (CTC) can be installed. Once these elements are completed, the new second track can be put into service and the CTC put into operation before the start of the new extended commuter train service.

4.4 Potential Impacts, Mitigation and Monitoring

4.4.1 Natural Environment

4.4.1.1 Drainage and Stormwater Management

Potential Impacts

The proposed CNR to CPR Highway 401 crossing will traverse Corbett Creek and the Corbett Creek Floodplain. As a result, two (2) culverts are being proposed where the new alignment tracks cross Corbett Creek, specifically south of Highway 401 (cross section 5004/5005) and north of Highway 401 (cross section 5014/5015). The proposed culvert south of Highway 401 will be a twin Conspan structure (or equivalent), each 11.0 m span by 3.4 m rise and the proposed structure north of Highway 401 will be a Conspan structure (or equivalent) 9.8 m span and 2.5 m rise. It is noted that these clearance levels are acceptable to address 100 year storm events within the Corbett Creek Floodplain (AECOM, 2009).

Additional drainage analysis will be conducted to investigate and confirm the best drainage solution for this area. Other concepts under consideration include possibly building a new culvert(s) under the CN track that may provide improved relief of flood conditions to a larger area including properties north of Highway 401. This alternative solution is currently being analysed and discussed between GO and existing property owners. Ultimately, the final drainage design will be in conformance with CLOCA storm and regional flood management requirements.

Beyond the Corbett Creek Floodplain, it is recognized that the increase in impervious surfaces (from parking lots etc.) will result in additional paved areas that will generate runoff. In addition, future construction activities will potentially result in migration of sediment from the construction site into adjacent watercourses and/or wetland features. Moreover, there is potential of erosion caused by newly exposed cut and fill slopes and ditches.

Mitigation Measures

New culverts/structures in the Corbett Creek Floodplain will be designed and sized to convey the required water levels during storm events, based on CLOCA and drainage design standards. During detailed design, the Flood Plain Mapping and flood storage areas will be refined and presented on full size drawing plates. Plans for a one year monitoring water quality program (prior, during and post construction) will also be prepared at the detailed design stage, and monitoring locations will be indicated on the drawing plates. In addition, a stormwater retention pond has been incorporated into the design of the proposed GO Rail Maintenance facility to ensure drainage and stormwater management (quality and quantity) are effectively addressed. The stormwater pond will be designed to achieve the following:

- Enhanced (Level 1) water quality control;
- Extetnded detention of the runoff from a 25 mm storm for at least 24 hours; and
- Control of post-development peak flow rates to pre-development levels for the two (2) year through 100 year storm events.

Stormwater at new station sites will be treated with stormceptors etc. in urban environments and will also incorporate LEED standards. Stormwater plans for the stations will follow a treatment train approach, incorporating source controls (i.e., green roof, cisterns, permeable pavement) and end of pipe controls (i.e., ponds, oil and grit separators) to the extent feasible. In some locations, there will be effectively no change to the paved areas (i.e., Oshawa NEW and Bowmanville north side). In other areas, where new parking lots are proposed at undeveloped locations (i.e., Thornton's Corners and Courtice Road, Bowmanville south side), stormwater runoff will either be dealt with through natural, overland methods, or connected to urban stormwater systems where they exist. Best management practices will be employed in stormwater management during and after construction.

During detail design, the size, location and discharge points for all stormwater management ponds and best management practices will be finalized and presented on full size drawing plates. Plans for a one year monitoring water quality program (prior, during and post construction) including the location, frequency and parameters will also be prepared at the detailed design stage, and monitoring locations will be indicated on the drawing plates. Separate stormwater management reports will be prepared for the stations and major crossings will be prepared at the detailed design stage. The reports will include inspection and monitoring requirements, will address potential interference with adjacent wells, and will include the floodlines for adjacent regulated watercourses.

In proximity to watercourses (i.e., Pringle Creek and Corbett Creek), the following additional mitigation measures shall apply:

- Direct all runoff and overland flows away from working areas and areas of exposed soils;
- Store and handle all oils, lubricants, and other chemicals in accordance with MOE policies and other applicable provincial/federal regulations;
- Refuel and maintain construction vehicles only in areas designated by the Contract Administrator; preferably on a paved, impermeable surface, and more than 30 m from Pringle Creek, the Whitby Harbour Provincially Significant Wetland (PSW) Complex, and Corbett Creek; and
- A Spill Response Plan shall be in place detailing the procedures to be followed in the unlikely event a spill were to occur. The Plan shall be developed in accordance with applicable legislation, and shall require a Spill Containment Kit consisting of, at least, absorbent materials to initially contain a spill, as well as protective gear for the handling of hazardous materials.

The potential spills and hazards from the proposed rail line expansion to the water crossings and underground water sources will be re-visited at detailed design, and appropriate mitigation measures will be recommended.

Additional mitigation measures to address the migration of sediment into adjacent watercourse include:

- Mulching and terraseeding of exposed soil;
- Placing silt control at catchbasins;
- All culvert works should be isolated from the watercourse and conducted in the 'dry'; and
- Placing silt fencing adjacent to slopes without sod or seed/mulch.
- Installing silt fencing, rock check dams, and/or other appropriate measures in ditches where required in accordance with the *Erosion and Sediment Control Guideline for Urban Construction* (2006) and/or as specified in Contract Drawings; and
- Regular maintenance (clean-out) of ditches to minimize sedimentation build-up.
- The use of soft, vegetative stabilizing treatments (e.g. seeding, shrubs, trees, ground cover) is recommended to mitigate potential erosion. Use erosion control blankets, mats or nets to assist in stabilizing newly graded slopes outside of the growing season when seed cannot be established. Daily monitoring of construction activities by GO Transit or a pointed agent with regard to sediment control and establishment of a maintenance protocol to respond immediately to identify problems.

4.4.1.2 Groundwater Resources

No impacts to groundwater resources are anticipated.

4.4.1.3 Fisheries

Through watercourse crossing construction activities, potential impacts to watercourses could include any of the following:

- Disruption of streambeds and banks, creating instability , and contributing to sediment and nutrient loading within the watercourse and receiving waterbodies (i.e., Lake Ontario) further downstream;
- Fish Habitat degradation through:
- Increased siltation from construction activities;
- Increase in length of covered structures (CSP and box culverts) in salmonid migration routes;
- Change in the natural thermal regime (i.e., warming caused by removal of riparian vegetation);
- Possible water contamination from construction activities (i.e., deleterious substances);
- Refuse within the watercourse (i.e., construction debris and garbage); and
- A harmful alteration, disruption, or destruction of fish habitat (HADD) by negatively affecting any one or more of the following:
- Migratory corridors (i.e., blocking access to spawning, feeding and/or over-wintering areas);
- Food producing zones (i.e., removal of leaf litter);
- Water quality (i.e., warmer, turbid waters lower oxygen levels and visibility to forage effectively);
- Cover (i.e., removal of structure that provides protection from predators, strong currents, and cooler temperatures); and
- Reproduction (i.e., altering spawning beds, in-stream cover, water temperature, and velocities essential for triggering reproductive habits and ensuring successful spawning).

The natural watercourses must be protected during and after construction to ensure direct and indirect impacts are fully mitigated. Significant impacts are not anticipated provided appropriate mitigation is implemented and monitored to ensure that the quality of local watercourses is maintained and that sediment is contained and cannot be transported offsite into Lake Ontario.

Potential Construction Impacts

Potential impacts to fish and fish habitat that may result from construction of a new crossing generally include:

- Localized permanent removal of the valley and associated culturally influenced and disturbance tolerant early successional riparian vegetation within the crossing location (within the existing rail corridor);
- Localized temporary disturbance to culturally influenced and disturbance tolerant early successional riparian vegetation associated with construction access;
- Debris entry to the stream during construction and in particular fill placement, which can be avoided with the implementation of standard mitigation measures; and
- Indirect construction-related impacts (e.g., erosion and sediment migration to the streams, construction debris) that can be managed with the implementation of standard mitigation measures.

Proposed Mitigation Measures

Similar construction-related mitigation measures and commitments to future work as outlined in **Section 4.4.1.1** will be employed for any maintenance or rehabilitation activities. Details regarding mitigation during construction for each GO facility are outlined below.

East Rail Maintenance Facility Site

- To ensure the protection of Pringle Creek, heavy-duty sediment fencing will be installed to prohibit sediment from entering the creek. Hay bale check dams should also be installed in areas where there is water conveyance from the surrounding fields.
- Due to the presence of coldwater species such as Rainbow Trout and Chinook Salmon, should in-water works occur, construction will avoid the period from September 15th to July 1st. Consultation with CLOCA and Ministry of Natural Resources (MNR) is required.
- A 30 m vegetated buffer is recommended from top of bank to ensure the protection of Pringle Creek.
- For areas where the tracks potentially cross Pringle Creek, culvert options should be ones with an open bottom. Restrictions set out by MNR/CLOCA regarding an acceptable culvert lengths should be discussed with CLOCA/MNR.

CNR to CPR Crossing Site

- To ensure the protection of Corbett Creek, heavy-duty sediment fencing should be installed to prohibit sediment from entering the creek. Hay bale check dams should also be installed in areas where there is water conveyance from the surrounding fields.
- Due to the presence of coldwater species such as Chinook Salmon, should in-water works occur, construction should avoid the period from September 15th to July 1st. Consultation with CLOCA and MNR is required.
- A 30 m vegetated buffer is recommended from top of bank to ensure the protection of Corbett Creek.
- For areas where the tracks potentially cross Corbett Creek, culvert options should be ones with an open bottom. There may be restrictions set out by MNR/CLOCA regarding an acceptable culvert length. This should be discussed with CLOCA/MNR.
- Fluvial geomorphology studies should be conducted to assist with crossing structure design and channel restoration efforts (e.g., mitigate bank slumping).

Thornton Road GO Station Site (Thornton's Corners)

- To ensure the protection of Corbett Creek, heavy-duty sediment fencing should be installed to prohibit sediment from entering the creek. Hay bale check dams should also be installed in areas where there is water conveyance from the surrounding fields.
- Due to the presence of coldwater species such as Chinook Salmon, should in-water works occur, construction will avoid the period from September 15th to July 1st. Consultation with CLOCA and MNR is required and will continue.
- A 30 m vegetated buffer is recommended from top of bank to ensure the protection of Corbett Creek.

Ritson Road GO Station Site (Oshawa GO Station NEW)

- No fisheries issues or design considerations necessary considering Oshawa Creek is off site.

Courtice Road GO Station Site (Darlington GO Station)

- No fisheries issues or design considerations necessary considering Tooley Creek is off site.

Rundle Road GO Layover Facility Site

- No fisheries issues or design considerations necessary considering Harmony Creek is 1 km away from the proposed station.

Martin Road GO Station Site (Bowmanville GO Station)

- No fisheries impacts or design considerations necessary.

Potential Operational and Maintenance Impacts

The daily operation and maintenance of the expanded rail corridor will have limited adverse impacts on fish and fish habitat. As with any transportation facility, there is some potential for impacts to the quality of the surface water that reaches a watercourse as a result of runoff during storm events. Potential water quality impacts are associated with the increased potential for generation of runoff contaminants and ROW management issues (e.g., fertilizer, etc.). However, this is an existing condition along the rail system and within the urbanized area generally.

General maintenance activities in the long-term may involve repair or rehabilitation of the structure which could potentially have localized impacts on fish and fish habitat. The impacts of such works will be limited to temporary, localized disturbances during construction of the repairs. These impacts are generally predictable, temporary and limited in extent, and will be managed with the implementation of standard mitigation measures.

Similar operation and maintenance related mitigation measures and commitments to future work as outlined in **Section 4.4.1.1** will be employed for any maintenance or rehabilitation activities

4.4.1.4 Vegetation and Wildlife

Potential Construction Impacts

The clearing of vegetation, along with the associated habitat removal required to accommodate the rail expansion and all associated facilities are examples of effects related to construction. (e.g., vegetation removals to accommodate grading, watercourse crossings, temporary road access, and drainage design, etc.). The elimination of forest vegetation may also create new forest edges that expose the retained vegetation to the impacts of increased light, noise, wind and sun. In addition, the construction of the rail expansion may result in the following adverse impacts:

- Soil disturbance/sedimentation to wetlands – The grading and disturbance of soils within the site introduce the potential for erosion and deposition of soils and silt within the wetland communities, especially during rain events during which stormwater flow in intermittent watercourses may materialize, and permanent watercourses may become vulnerable to sediment and erosion disturbance;
- Modification/loss of wildlife habitat – The quality and quantity of habitat could be reduced as a result of vegetation removal, which could affect life processes such as breeding, shelter/nesting and feeding areas;
- Flight response/disturbance to avifauna – Nesting season generally takes place from mid-May to mid-July for most species. If the construction activities take place during this period, birds will likely be discouraged from nesting in the vicinity due to a number of factors, including:
    - Increased flight response from higher levels of auto and human traffic;
    - Interrupted ability to vocalize, which is necessary to attract mates and defend territory; and
    - Decreased access/availability of forage due to vegetation clearing and compaction;
- Wildlife susceptibility/mortality – The use of heavy machinery and construction activity (e.g., grubbing) have the potential to cause wildlife injury and even death;
- Impacts on wildlife movement – Severing habitat can affect wildlife mobility. Some species may be uncertain about crossing the construction zone;
- Release fuels and other contaminants into natural areas;
- Clearing and damage of vegetation beyond the study area; and
- Alterations in drainage patterns (e.g., surface runoff or groundwater flow). These changes can also affect wetland and vegetation communities dependant on these water sources.

Proposed Mitigative Measures

To minimize direct impacts to vegetation, habitat features, and wildlife, and to protect adjacent vegetation/habitat features from indirect impacts during construction, the following mitigation measures should be considered:

- Temporary vegetation protection fencing should be installed to protect valley and riparian vegetation adjacent to work areas. The fencing should be secure and could necessitate the attachment of silt fencing for erosion control, depending on the circumstances within the site.
- Vegetation clearing zones and vegetation retention zones should be distinctly marked in both the Contract documents and the physical site itself to minimize the risk of unnecessary or inadvertent vegetation impacts and avoid incidental impacts as a result of temporary stockpiling, debris disposal and access. Works zones will be delineated in the field using construction fencing to minimize the area of disturbance and prevent disturbance of adjacent areas.
- Appropriate vegetation clearing techniques (e.g., trees to be felled away from the retained natural areas) will be used to remove vegetation required for the proposed works).
- A re-vegetation plan should be developed for areas disturbed by the proposed works.
- The bridge structure design will maintain existing wildlife movement opportunities.
- Erosion and sediment control measures will be designed, implemented and maintained throughout construction. This includes installing sediment and erosion control fencing along the edge of the required working area to protect the edges of all retained natural areas, as well as proper containment and filtering of all construction generated sediment (whether from dewatering or soil exposure from clearing and grubbing).
- All exposed surfaces will be re-stabilized and re-vegetated as soon as possible following construction, using an appropriate native seed mix.
- All construction-related debris will be appropriately contained during construction and cleaned-up and properly disposed of following construction.
- All activity will be controlled so as to prevent entry of any petroleum products, debris or other potential contaminants/deleterious substances, in addition to sediment as outlined above, to natural areas.
- No petroleum product storage, maintenance or refuelling of equipment will be conducted within these valleys. A Spills Prevention and Response Plan will be developed by the Contractor and spills cleanup materials will be kept on site at all times.
- GO Transit or a pointed agent will be responsible for ensuring that all environmental mitigation and design measures are properly installed/constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required.
- The Contractor shall not destroy the active nests (nests with eggs or young birds), or wound or kill birds, of species protected under the *Migratory Birds Convention Act* and/or Regulations under that Act. All works will be complete in compliance with the *Migratory Birds Convention Act*.
- Where feasible, timing constraints will be applied to schedule vegetation clearing and structure works (where birds may nest on a structure) outside of the breeding bird season (May 1st to July 31st).
- If vegetation clearing cannot be scheduled outside the breeding bird season timing noted above, then GO Transit of a pointed agent will be employed to conduct a nest survey in the area to be cleared. The pointed agent identified by GO shall have completed a university or college education in a pertinent environmental discipline and shall have experience and/or training in the identification of birds and their nests and eggs as well as the assessment and development of appropriate mitigation measures to address the presence of migratory birds during construction. If active nests of migratory birds are located, then clearing must discontinue until after the breeding bird season (i.e., clearing is allowed August 1st to April 30th). This may involve delays to allow for fledging.
- If structure works cannot be scheduled outside the identified nesting season, ensure that bird nesting preventative measures (such as wire screens or tarps) are implemented to prevent new nesting prior to May 1st and are maintained until July 31st of the calendar year in which they were installed. At a minimum, the preventative measures will be installed at structures where evidence of past nesting was observed. These measures will be periodically checked, and maintained as required, so as not to entrap birds, and removed following construction when no longer needed.
- Remove “inactive” nests (previous season, adult birds are not seen flying in and out of) prior to construction, or prior to undertaking the preventative measures outlined above.
- Any wildlife incidentally encountered during construction will be protected and will not be knowingly harmed. As required, GO Transit or a pointed agent will capture and release any small wildlife (e.g., turtles, amphibians) stranded within the construction zone.

East Rail Maintenance Facility Site

- To ensure the protection of Whitby Harbour PSW Complex, heavy-duty sediment fencing will be installed to prohibit sediment from entering Pringle Creek. Hay bale check dams will also be installed in areas where there is water conveyance from the surrounding fields.
- Should the design require the removal of isolated wetland, compensation measures in the form of wetland enhancement/restoration along the Whitby Harbour PSW Complex would be necessary. This should be discussed with CLOCA to establish the most appropriate compensation measure.
- Low impact lighting, limited use of impervious surfaces and water quality controls should be implemented at the ERMF in an effort to minimize potential impacts on the Whitby Harbour PSW Complex immediately downstream of the proposed site.

CNR to CPR Crossing Site

- To ensure the protection of Corbett Creek Coastal Marsh, heavy-duty sediment fencing should be installed to prohibit sediment from entering Corbett Creek. Hay bale check dams should also be installed in areas where there is water conveyance from the surrounding fields.
- Should the design require the removal of wetland communities, compensation measures in the form of wetland enhancement/restoration along Corbett Creek and the Corbett Creek Coastal Marsh would be necessary. Otherwise, a minimum 10 m buffer should be applied along the boundaries of the wetland communities. This should be discussed with CLOCA to establish the most appropriate compensation measure.
- At the crossing locations, these areas might need to span and avoid the wetland areas.
- The potential to create wetland habitat to enhance the existing Corbett Creek Coastal Marsh should be further explored if necessary.

Thornton Road GO Station Site (Thornton's Corners)

- To ensure the protection of Corbett Creek Coastal Marsh, heavy-duty sediment fencing should be installed to prohibit sediment from entering Corbett Creek. Hay bale check dams should also be installed in areas where there is water conveyance from the surrounding fields.
- Should the design require the removal of wetland communities, compensation measures in the form of wetland enhancement/restoration along Corbett Creek and the Corbett Creek Coastal Marsh would be necessary. Otherwise, a minimum 10 m buffer should be applied along the boundaries of the wetland communities. This should be discussed with CLOCA to establish the most appropriate compensation measure.
- At the crossing locations, these areas might need to span and avoid the wetland areas.

Ritson Road GO Station Site (Oshawa GO Station NEW)

- Should trees along municipal property require being trimmed/removed, compensation may be required within suitable municipally owned lands.

Courtice Road GO Station Site (Darlington GO Station)

- Should trees along municipal property require being trimmed/removed, compensation may be required within suitable municipally owned lands.

Rundle Road Layover Facility Site

- Should the design require the removal of wetland communities, compensation measures in the form of wetland enhancement/restoration may be necessary. Otherwise, a minimum 10 m buffer should be applied along the boundaries of the wetland communities. This should be discussed with CLOCA to establish the most appropriate compensation measure.

Martin Road GO Station Site (Bowmanville GO Station)

- No impacts or design considerations necessary.

Potential Operational and Maintenance Impacts

Potential impacts to vegetation and associated habitat and wildlife as a result of operational and maintenance activities include:

- Generation of runoff contaminants;
- Temporary disturbance during structure and facility maintenance or future rehabilitation;
- General wildlife disturbance and noise;
- Lighting disturbance to wildlife; and
- ROW management (i.e., fertilizer, etc.).

General rehabilitation activities in the long-term may involve repair or replacement structures over the water crossings or general rehabilitation activities to other components of the rail line and associated facilities. The activities may involve limited temporary disturbance of vegetation and wildlife. These impacts are generally predictable, temporary and limited in extent, and can be managed with the implementation of standard construction-related mitigation measures.

- Noise implications of transportation facilities (specifically highways) can have negative impacts on some bird species, the impacts and sensitivity may vary considerably among bird species. Wildlife mortality and reduced connectivity at key areas in the landscape can be addressed by maintaining permeability for wildlife through the new and existing crossings.

4.4.1.5 Species at Risk

No Species at Risk were identified in the study area. Potential impacts and mitigation to fisheries, vegetation and wildlife are described above.

4.4.1.6 Designated Natural Heritage Features

See vegetation impacts/mitigation above.

4.4.1.7 Air Quality

Potential Construction Impacts

A temporary decrease in air quality is plausible during construction with the operation of construction equipment causing an increased amount of localized dirt/dust.

Proposed Mitigation Measures

Dust control measures and prevention of soils tracking by vehicles and personnel form construction site, including wetting of soil with potable water, reduced speeds for on-site vehicles, tire washing stations and restricting working areas in high wind conditions will be reviewed for inclusion in the contract package during detail design. The Contract Administrator will ensure that dust control measures in contract are adhered to during construction.

Potential Operational and Maintenance Impacts

The air quality assessment as documented in **Appendix E** reviewed current standards and guidelines for air contaminants of CO, NO_x, SO_2, PM and VOCs. Ambient air concentrations were taken from local monitoring stations. Scenarios were developed for the future build and future no build scenarios. Emission factors for CO, NO_x, SO_2, PM and VOCs, using MOBILE 6.2, were developed for several road types and fleets. A conservative air dispersion model using CAL3QHCR was developed using all of the information collected. For the highest impacted receptors, the main findings of the air quality assessment include:

- All contaminants with the exception of NO_x are below their respective standard, guideline or interim reference level around all GO Transit stations
- In many cases, the ambient concentrations make up a large percentage of the total concentrations
- The ambient acrolein background level is already 50% of the standard. The future no-build to future build scenarios will only increase the acrolein levels by up to 12%. The future build scenario should contribute to reducing the ambient concentration of acrolein on a regional basis, but this impact has not been quantified.
- Comparing the future no-build and future build scenarios, most of the contaminants will not increase by a level greater than 10% and no contaminant will increase more than 19%.

The local effects of the future build are limited to receptors closest to the proposed stations. The modelled impact and concentration levels greatly decrease with increasing distance from the stations. Although there is an increase in local impacts, contaminant levels on a regional level will decrease due to commuters using the transit expansion. Furthermore the Future Build 2015 scenario will result in a decrease in the local concentrations of many contaminants such as NO_x and Benzene.

4.4.1.8 Human Health Risk Assessment

Potential Construction Impacts

See Section 4.4.1.7 above.

It is noted that any air quality impacts (i.e., largely minor dust effects) associated with construction will be localized and short term. As such, construction activities are unlikely to have any effects on adjacent properties or receptors provided appropriate mitigation measures are put in place.

Proposed Mitigation Measures

See Section 4.4.1.7 above.

Potential Operational and Maintenance Impacts

See Section 4.4.1.7 above.

A Screening Level Human Health Risk Assessment (SLHHRA) of Air Quality Impacts (see **Appendix E**) was completed with the focus on the impacts on the surrounding communities of increased airborne emissions from the planned service levels of rail traffic on the Lakeshore East rail corridor as part of the proposed service expansion. Overall, the SLHHRA follows the standard Human Health Risk Assessment framework comprised of the following steps: problem formulation, exposure assessment, hazard assessment, and risk characterization.

The results of the assessment indicated that, even under worse-case conditions, none of the diesel contaminants emitted from the rail corridor individually exceeded the relevant regulatory benchmarks, for any of the five (5) specific exposure scenarios (i.e., Current Day, Future No Build (2015), Future Build (2015), Future No Build (2031), Future Build (2031)). While some of the predicted cumulative risks exceeded the benchmarks (typically due to elevated regional background concentrations of those chemicals), the incremental increase in risk between the Future Build (i.e., implementation of the proposed expansion and related increased in daily vehicle service level capacity) and Future No Build (i.e., planned daily vehicle usage levels based on current unexpanded corridor capacity), would be very small. Moreover, predicted risks were no different or actually less than predicted risks under Current Day scenario, due primarily to the intended transition by GO Transit to a locomotive fleet that is Tier 4-compliant before 2031.

Proposed Mitigation Measures

The most effective approach to improve local air quality throughout the GO Transit rail system would be the transition to Tier 4-compliant diesel vehicles by GO Transit as well as the continuation of provincial and federal initiatives that reduce ambient background concentrations of contaminants of concern in the GTA regional airshed overall.

4.4.1.9 Contaminated Properties

It would not be uncommon to encounter some contaminated soils along a railway corridor. Contaminated soils will be dealt with in accordance with MOE regulations and GO Construction Specifications. In addition, a Soils Management Plan will be developed as part of detail design (i.e., site assessment or construction work). It will include provisions to characterize soils, determine suitability for proposed site use and address handling and disposal requirements for excess soils during construction.

4.4.2 Socio Economic Environment

4.4.2.1 Noise and Vibration

Potential Construction Impacts

Construction noise impacts may vary greatly depending on the duration of construction, construction methods employed and the location of construction activities within the Project Limits. Projects involving a period of construction more than several months or involving particularly noisy construction equipment may warrant a very detailed construction noise assessment. Noise impacts during construction can potentially disrupt adjacent residential communities.

Vibration impacts from construction activities may also vary greatly depending on the construction methods employed and the location of the construction activities. Projects involving typical low impact construction equipment may be addressed adequately by means of a qualitative construction vibration assessment. However, projects employing high

impact equipment should be addressed by means of a detailed quantitative construction vibration assessment. In extreme cases, construction vibrations can cause structural damage to buildings and underground structures.

Proposed Mitigation Measures

Prior to construction, it is recommended that the Contractor disseminate information to the general public regarding the planned construction activities, construction duration and project outcome within the Project Limits. Procedures should also be developed and implemented to receive and address noise and/or vibration complaints during construction.

The Contractor is to adhere to the MOE's guidelines associated with construction equipment noise levels, which are outlined in NPC-115 Construction Equipment. Contractors should also adhere to the Ministry's noise guidelines NPC-118 and NPC-207, as well as any local municipal noise by-laws as established by the Town of Whitby, the City of Oshawa, or the Municipality of Clarington.

It is critical that situations of potentially damaging construction vibrations be avoided to ensure that loss of life or property is avoided. Where construction will include high impact vibration activities it is crucial that a construction vibration assessment is prepared before the start of construction.

Potential Operational and Maintenance Impacts

Following project implementation, the maximum noise impact level generated by the proposed ERMF was predicted to be 7 dB, which represents the night-time noise impact for both the Day 1 (2015) and Ultimate (2031) scenarios. This exceeds the 5 dB trigger value and represents a 'Significant' impact rating. As noted in the Environmental Noise and Vibration Assessment, noise mitigation measures must be considered for this site, based on administrative, operational, economic, and technical feasibility.

The proposed Rundle Road Layover Facility site in the Municipality of Clarington is anticipated to exceed the 5 dB sound level threshold for the Day 1 (2015) and Ultimate (2031) scenarios. The maximum day-time and night-time noise impacts for Day 1 (2015) are expected to be 9 dB and 16 dB respectively. For the Ultimate (2031) scenario, the maximum day-time and night-time noise impacts are expected to be 11 dB and 18dB respectively. It is noted that Day 1 (2015) noise impacts are predicted to be approximately 2 dB lower than the Ultimate (2031) noise impacts due to the lower Day 1 (2015) train volumes. The maximum Ultimate (2031) adjusted noise impact level generated by the proposed Rundle Road Layover Facility was predicted to be 18 dB, which represents a 'Very Significant' impact rating. Thus, noise mitigation measures must be considered based on administrative, operational, economic and technical feasibility.

Although the noise and vibration impacts of the four (4) proposed train stations as well as the commuter train service are expected to fall within applicable noise and vibration impact limits, noise from stationary sources such as heating, ventilation and air-conditioning (HVAC) units as well as public address systems may contribute to additional nuisance impacts following construction. It should be noted that wheel squeal noise could be significant at/near the curved sections of the new GO Transit rail tracks (new rail crossing over Highway 401 from CNR to CPR tracks; Whitby Rail Maintenance Facility and Rundle Road Layover Site).

The noise analysis work carried out during this study did not identify any other locations that warranted noise mitigation along the corridor, in accordance with MOE standards.

Proposed Mitigation Measures

The installation of a 5 m high sound barrier within the ERMF property on the north west portion of the proposed ERMF would reduce the maximum noise impact from 7 dB to 2 dB, which represents an 'Insignificant' noise impact rating. This noise barrier wall will also mitigate noise from outdoor maintenance activities in addition to that from idling locomotives. Though it is recognized that with the installation of this barrier the analysis indicates that a 2dB noise excess beyond current ambient noise levels may persist at the nearest residence, during detailed design additional noise control measures (that may include physical and or administrative measures) will be considered to reduce noise levels generated from the maintenance facility The ERMF should also be designed such that noise emissions from permanent stationary sources of noise comply with the requirements of the MOE Publications NPC-205/232.

The installation of 5 m high sound barriers on the on the north and south sides of the proposed Rundle Road Layover Facility site would provide a daytime noise reduction of approximately 6 dB. This would reduce the maximum ultimate (2031) noise impacts to affected residences to the north to 12 dB and to the south to 7 dB. Though it is noted that even with the installation of 5.0 meter high sound barriers the analysis indicates that 2-9dB noise excesses beyond current ambient noise levels may persist, during the detailed design stage additional noise control measures will be considered to reduce noise levels generated from the layover facility. Such measures may include physical measures such as higher sound barriers if they are technically and economically feasible and/or administrative measures. Illustrations of the above noted noise barrier walls can be found in the Environmental Noise and Vibration Assessment, which is contained in **Appendix F** of this report.

Noise from stationary sources should be addressed during detail design once they have been finalized, and it is recommended that HVAC equipment be selected such that they are no larger in capacity than typical residential units (if feasible). The public address system should be limited during early morning or night-time hours, and the height and placement of the speakers will be confirmed during detail design and will include consideration of potential noise impacts, vulnerability to vandalism etc. Notwithstanding the above, the stations should be designed such that noise emitted from stationary sources complies with the requirements of MOE Publication NPC-205 or NPC-232, as applicable.

Rail squeal noise resulting from the movement of trains around curves is a very complex phenomenon that does not lend itself well to accurate prediction. As such, it is typically assessed when and if a problem develops with an existing installation. Notwithstanding the difficulties related to quantifying the incidence or severity of rail squeal in advance of construction, there is the possibility that rail squeal noise will be generated at the track curvatures in the vicinity of the Highway 401 crossing for this project. It is likely that the high levels of ambient noise due to road traffic on the Highway 401 will effectively mask any rail squeal noise generated. However, GO Transit will consider rail squeal noise generation during the detailed design of this project since mitigation measures do exist for the abatement of rail squeal noise generated at curves and if warranted they should be utilized for this project. If the project is constructed without the benefit of rail squeal noise abatement measures GO Transit will implement a complaints and/or noise monitoring procedure to track incidences of rail squeal and install retrofit abatement measures should they be indicated as warranted due to complaints and/or noise levels.

As rail squeal is caused by tight rails being rubbed by steel train wheels, this also has the effect of premature grinding of the rail and creating rail wear. It is in GO Transit's interest to address this matter both in the initial detailed design of this track as well as when this noise is detected during operations as this will mean premature rail wear and added cost to replace this rail early. In summary, it will be in GO Transit's interest to design these curves correctly to eliminate this

possibility. Should rail squeal noise eventually arise GO Transit will correct the matter for many reasons, including the benefit of the public, operational issues and cost related factors.

4.4.2.2 Business and Economic Impacts

Potential Construction Impacts

Construction of the proposed GO facilities may result in some negative as well as positive impacts to adjacent businesses and economies within the Project Limits. During construction, business impacts are anticipated in the vicinity of the proposed GO facility sites through accessibility. Construction of the facilities may result in traffic delays and may disrupt businesses from conducting their daily routines. Additional traffic detouring may be required to alleviate some encounters with construction vehicles.

As noted in **Table 18**, there are seven (7) properties within the Project Limits that facilitate existing agricultural businesses. Through discussions with property owners of the agricultural fields, it was advised that the owners of these properties currently lease out their lands to farmers for cash crop (e.g., corn) agriculture. As a result of the proposed GO facilities, the existing agricultural fields will be displaced as GO Transit will be required to purchase these land parcels. Thus, it is noted that at least five (5) farmers will lose the opportunity to farm these lands prior to construction.

From an economic perspective, construction of the service expansion to Bowmanville will likely result in additional employment opportunities within the Region during construction. Construction workers within the area will be afforded an opportunity to bid on this project. During construction, additional economic benefits are anticipated through adjacent commercial expenditures. Given that the site is adjacent to several businesses, restaurants, as well as equipment rental centres (e.g., north of Highway 401, adjacent to the CNR to CPR crossing site), it is expected that the local economy will receive additional business. There may be additional opportunities for construction workers to purchase supplies (e.g., concrete or asphalt) within the Region.

As detailed in **Section 4.4.2.1**, there is a potential for nuisance impacts to the adjacent businesses during construction on the proposed GO service facilities. Adjacent businesses that are considered noise sensitive (e.g., the hotel north of Champlain Avenue) will require the prescribed mitigation measures outlined above to alleviate noise impacts during construction.

Proposed Mitigation Measures

As noted in **Section 4.4.2.3**, traffic detouring will be implemented during construction where applicable to ensure local traffic (including local traffic from adjacent businesses) is redirected as best possible to reduce negative impacts to the overall community. Prior to construction, GO/Metrolinx will maintain contact with regulatory agencies, utility companies, and members of the public on the master study mailing list to facilitate in minimizing additional business and economic impacts during construction. The notification should include information on how the public/adjacent businesses can raise issues/concerns during construction and include a contact name and telephone. Any complaints received will be appropriately investigated and resolved in an effective manner.
Metrolinx/GO will continue to consult with directly impacted property owners during detail design to confirm the lease agreements with the existing farming activities that would directly be impacted by this study. Land leasing agreement terms will be reviewed and construction will be timed appropriately to minimize leasing conflicts where possible. Should additional land conflicts exist as a result of breaching contracts, they were be appropriately dealt with during detail design. Additional mitigation related to noise and vibration construction impacts to adjacent businesses during construction are described in **Section 4.4.2.1** above.

Potential Operational and Maintenance Impacts

Following project implementation, adjacent communities will benefit from the expanded GO services and increased frequency of GO trains in Oshawa. Transit services extending from Bowmanville will better connect the gateway in Oshawa and provide for better interconnectivity of upper-tier municipalities. Within Bowmanville, business and economic impacts will be positively influenced by the Martin Road GO Station (Bowmanville) as the current development plans propose to establish a coffee shop and gas station within the northwest quadrant of Martin Road and Aspen Springs Drive. However, there is some potential for additional noise impacts as well as traffic impacts as a result of implementing the Recommended Plan.

Proposed Mitigation Measures

As outlined in **Section 4.4.2.1**, mitigation measures will be employed to reduce the potential noise and vibration impacts to adjacent businesses following implementation of the Recommended Plan. Moreover, with implementation of the recommended traffic improvements to each respective station site location as outlined in **Section 4.4.2.3**, it is anticipated that additional traffic impacts to business will be marginal. In fact the new GO Station traffic may benefit nearby businesses.

4.4.2.3 Traffic Impacts

Potential Construction Impacts

Given that the proposed service expansion will result in some grade separations (see **Section 4.2.11**) on existing municipal roadways, traffic delays are anticipated during construction. Although the construction of the ERMF and adjacent road works are adjacent to a large steel company, it has been previously noted that there are other adjacent roadways that the truck traffic can use during construction. Additional traffic impacts for the rest of the proposed GO facilities will be from local residents of the area, adjacent businesses, as well as emergency/school bus services.

Proposed Mitigation Measures

In order to minimize the proposed traffic delays as a result of the proposed improvements, proposed traffic staging and management plans will be developed and provided to the Contractor in consultation with municipalities, emergency services, adjacent businesses, and school bus transportation services during detail design. Such staging plans may include, but not limited to traffic control flagmen that will provide right of way to emergency services, and on-site/offsite detouring. The Contractor is to maintain communication with regulatory agencies throughout construction and ensure traffic staging is proceeding according to plan. Should the Contractor decide to deviate from this plan, the Contractor will be required to prepare and submit a revised plan in consultation with the regulatory agencies.

In addition to the above, Metrolinx/GO will continue to work with Gerdau Ameristeel during detail design to ensure that truck traffic delays are minimal during construction of the ERMF. It is noted that opportunities for alternate traffic routes that serve Gerdau Ameristeel exist within the area and Metrolinx is committed to facilitating such opportunities where feasible.

Potential Operational and Maintenance Impacts

Following construction, four (4) GO Stations will be in operation, three (3) of which will include over 1,000 parking spaces for commuters with opportunities for future parking expansions. Traffic studies have been completed by the Project Team to assess future conditions once such facilities are in operation.

Thornton Road GO Station Site (Thornton's Corners)

It is estimated that 1,333 riders are expected during the AM peak period for the year 2015. Approximately 70% of GO riders arrive and/or leave the station by auto while utilizing the parking terminals, whereas 15% are dropped off/picked up using the passenger pick-up and drop-off area of the station. The remaining 15% of passengers arrive and/or leave the station by modes other than auto such as transit, taxi and active transportation. As a result of the traffic study analysis, approximately 1,950 total vehicle trips are expected to be generated by the proposed GO Station during AM and PM peak periods. Of this total, approximately 400 people would use the passenger pick-up and drop-off facility while approximately 1,550 people would use the parking facility (AECOM, 2009).

Two (2) alternatives were considered in order to assess the overall impacts of the proposed development on the adjacent road network: Alternative 1 does not include the extension of the Consumers Drive to Thornton Road while Alternative 2 considers the extension of Consumers Drive to Thornton Road. The results indicate that all adjacent intersections to the Station site will operate at a Level of Service (LOS) 'D' or better during AM and PM peak period of demand with the exception of the Gibb Street/Thornton Road intersection (southbound left movement), which portrays a LOS 'F'.

With the proposed extension of Consumers Drive, all of the intersections within the vicinity of the Station site will operate at LOS 'C' or better during AM and PM peak periods of demand with exception of the Gibb Street/Thornton Road intersection (southbound left movement), which portrays a LOS 'F' (AECOM, 2009).

Ritson Road GO Station Site (Oshawa GO Station NEW)

It is estimated that 1,636 riders are expected during the AM peak period for the year 2015. The general assumption made is that approximately 70% of GO riders would arrive and/or leave the station by auto while utilizing the parking terminals where 15% are dropped off/picked up using the passenger pick-up and drop-off area of the station. The remaining 15% of passengers arrive and/or leave the station by modes other than auto such as transit, taxi and active transportation. As a result, of the traffic study analysis, approximately 2,270 total vehicle trips are expected to be generated by the proposed GO Station during AM and PM peak periods. Of this total, approximately 460 people would use the passenger pick-up drop-off facility while approximately 1,800 people would use the parking facility (AECOM, 2009).

Two (2) alternatives were considered in order to assess the overall impacts of the proposed development on the adjacent road network: Alternative 1 does not include the proposed road improvements from the intersection of Olive Avenue and Drew Road to the intersection of Simcoe Street and Gibb Street/Elm Street while Alternative 2 does consider the Gibb Street/Elm Street roadway improvements. The traffic study projected future background traffic volumes, which includes traffic generated by the existing road network and planned developments in the vicinity of the site, excluding the traffic generated by the GO Station site. This information was then combined with the proposed development of the GO Station site to form future total traffic volumes to 2015 (AECOM, 2009).

The results show that future total traffic conditions for all of the intersections within vicinity of the proposed GO Station site for both alternative operate at a LOS 'D' or better during the AM and PM peak period of demand with the exception of the following intersections, which will operate with a failing LOS 'F' either in AM or PM peak period of demand:

- Intersection of 1st Avenue and South Entrance (unsignalized)
- Intersection of 1st Avenue and Simcoe Street (signalized)

In order to effectively improve the anticipated traffic delays as a result of the proposed development within the vicinity of the station site, the following recommendations have been prescribed:

- Signalization of the south entrance with 60 second cycle length;
- An exclusive westbound left turn lane at the north entrance for traffic coming from Olive Avenue during the PM peak hour;
- An exclusive westbound right turn lane at the south entrance for traffic coming from 1st Avenue during the AM peak hour; and
- An exclusive westbound left turn lane at the intersection of 1st Avenue and Simcoe Street for traffic coming from 1st Avenue during the PM peak hour.

Courtice Road GO Station Site (Darlington GO Station)

It is estimated that 1,636 riders are expected during the AM peak period for the year 2015. The general assumption made is that approximately 70% of GO riders would arrive and/or leave the station by auto while utilizing the parking terminals, where 15% are dropped off/picked up using the passenger pick-up and drop-off area of the station. The remaining 15% of passengers arrive and/or leave the station by modes other than auto such as transit, taxi and active transportation. As a result of the traffic study analysis, approximately 2,400 total vehicle trips are expected to be generated by the proposed GO Station during AM and PM peak periods. Of this total, approximately 490 people would use the passenger pick-up and drop-off facility while approximately 1,900 people would use the parking facility (AECOM, 2009).

The results indicate that under future total traffic conditions all of the intersections within the vicinity of the proposed Courtice Road GO Station site will operate at LOS 'D' or better. The access road to the proposed site will fail from a traffic perspective. The northbound left and southbound through movements during AM peak hour and eastbound left and northbound left during PM peak hour will fail at this entrance under the future total traffic conditions. However, by signalizing the parking entrance from Courtice Road, this will improve the LOS of the parking entrance from 'F' to 'B' and 'C' during the AM and PM peak hours of operation respectively. All the key intersections adjacent to the proposed GO Station will also operate at good LOS 'D' or better as well during the peak hours of operation. It is further noted that access may be additionally improved once the future ROW immediately north of the proposed Station site is constructed.

The following recommendations are prescribed for the parking entrance to ensure improved traffic progression to/from the parking entrance:

- Northbound exclusive left turn lane with 30 metres storage length;
- Eastbound exclusive left turn lane; and
- Signalization of the parking entrance with 60 second cycle length.

The above noted recommendations are expected to improve the intersection operations with significantly reduced delay times.

Martin Road GO Station Site (Bowmanville GO Station)

It is estimated that 1,112 riders are expected during the AM peak period for the year 2015. The general assumption made is that approximately 70% of GO riders would arrive and/or leave the station by auto while utilizing the parking terminals, where 15% are dropped off/picked up using the passenger pick-up and drop-off area of the station. The remaining 15% of passengers arrive and/or leave the station by modes other than auto such as transit, taxi and active transportation. As a result of the traffic study analysis, approximately 1,630 total vehicle trips are expected to be generated by the proposed GO Station during AM and PM peak periods. Of this total, approximately 330 people would use the passenger pick-up and drop-off facility while approximately 1,300 people would use the parking facility (AECOM, 2009).

In addition to the proposed GO Station site development within the area, the traffic analysis considered an additional three (3) alternatives to the proposed Tim Hortons and gas bar establishments, which is to be located within the northwest quadrant of the Martin Road and Aspen Springs Drive intersection. The following alternatives under consideration are listed below:

Alternative 1:

The site of the coffee shop/gas station is provided with both in and out accesses (Access T1) to/from Access G2 which connects to Martin Road and provides access from the east to the Bowmanville GO Station.
The site of the coffee shop/gas station is provided with both in and out accesses from Aspen Springs Drive at the edge of the southern parking lot (Access T2).

Alternative 2:

The site of the coffee shop/gas station is provided with an entrance (but no exit) from Access T1 to Access G2 which connects to Martin Road and provides access from the east to the Bowmanville GO Station.
The site of the coffee shop/gas station is provided with both in and out accesses from Aspen Springs Drive at the edge of the southern parking lot (Access T2).

Alternative 3:

The site of the coffee shop /gas station is provided with both in and out accesses (Access T1) to/from Access G2 which connects Martin Road and provides right-in/right out access from the east (Access G2) to the Bowmanville GO Station.
The site of the coffee shop /gas station is provided with both in and out accesses from Aspen Springs Drive at the edge of the southern parking lot (Access T2).

Based on the results, with intersection improvements at Martin Road and Aspen Springs Drive, it can be concluded that the overall traffic impact of the proposed GO Station development will be relatively minimal on traffic operations within the study area intersections. These intersections will perform poorly mainly to the general traffic growth to the area not specifically due to the proposed station site. A southbound exclusive right turn lane at Martin Road and Access G2 is recommended to improve traffic operation based on our analysis.

Potential Operational and Maintenance Impacts

Traffic volumes on public roads and transit schedules are part of the municipal/Metrolinx operation procedures. As development proceeds adjacent to each of the station sites, impacted municipalities will ensure a continued functioning road network, which may involve conducting subsequent traffic studies. Metrolinx will continue to monitor its ridership for the newly developed GO Train Stations.

4.4.2.4 Property Impacts

Potential Construction Impacts

As noted in **Table 4.5**, construction of the proposed expansion of GO services from Oshawa to Bowmanville will impact approximately 23 location properties. Some of these properties have been previously purchased by GO Transit, while the majority are currently owned by members of the public/commercial establishments. Although the track twinning will occur within the existing CPR line ROW and no additional property requirements are anticipated, property is required for the proposed GO facilities.

Table 4.5 Property Acquisitions within the Project Limits

Proposed GO Facility	Ownership	Existing Property Status
East Rail Maintenance Facility	Private	Residential – For Sale
	Private	Commercial
	Private	Commercial Lot – For Sale
	Private	Agricultural Field
	Private	Agricultural Field
CNR to CPR Crossing Site	Public	Town of Whitby
	Private	Vacant/Commercial
	Private	Agricultural Field – For Sale
	Private	Scrubland
	Private	Agricultural Field
	Private	Old Field
	Private – GO Transit	Old Field
	Private	Disturbed – Commercial Developer
Ritson Road GO Station Site	Private – CPR	Abandoned Rail Yard
	Private	1. Derelict Knob Hill Farms Building – For Sale
	Private	Parking Lot
Courtice Road GO Station Site	Private	Agricultural Field
	Private	Woodlot
Rundle Road Layover Facility Site	Private	Residential
	Private – Hydro One	Vacant Field
	Private	Woodlot
	Private	Agricultural Field
	Private	Agricultural Field
Martin Road GO Station Site	Private – GO Transit	Disturbed Vacant Field
	Private – GO Transit	Disturbed Vacant Field
	Private	Disturbed Vacant Field

In addition to the directly impacted properties noted above, there is a potential for indirect property impacts on those properties adjacent to the proposed GO facilities during construction activities (e.g., nuisance impacts).

Proposed Mitigation Measures

The Contractor will be required to minimize any potential impacts caused by construction to adjacent properties. A monitoring program will be implemented prior to construction and will include a pre-condition survey of existing

conditions and areas that warrant special concerns. As noted above, some of the existing properties have already been advertised for sale and Metrolinx has already begun discussions with the respective property owners. Through the formal Notice of Commencement and the second round of public Open Houses, all potentially impacted property owners were notified of the plans to acquire property to facilitate with completion of this project and given ample opportunity to discuss the project in greater detail with the Project Team throughout this EA. During detail design, Metrolinx/GO will continue to undertake property acquisition of the above noted properties.

As part of these discussions, an offering price is discussed based on fair market value and an agreement is reached between the parties. If agreements are not reached, Metrolinx/GO can initiate expropriations procedures under the *Expropriations Act*. With respect to potentially impacted adjacent properties, the Contractor will be required to minimize any inconvenience caused by construction to such properties. Additional property impacts as a result of the construction activities relating to air quality, noise, and/or vibration have been addressed elsewhere in this section.

4.4.3 Cultural Environment

4.4.3.1 Archaeological Impacts

A Stage 1 and 2 archaeological assessment was conducted by TMHC for the proposed construction sites associated with the Lakeshore East corridor expansion (see **Appendix G**). The Stage 1 assessment indicated that the Project Limits and seven (7) proposed construction properties had potential for the discovery of either First Peoples or historic era archaeological resources. As such, a Stage 2 combined pedestrian and test pit archaeological assessment was carried out, using a five metre interval.

Only one property could not be accessed during the EA for archaeological investigations. That property is impacted by the Rundle Road layover site. Archaeological work in this area will be carried out after the property is purchased by GO and prior to construction.

Potential Construction Impacts

No archaeological material was identified within the parcels intended for the proposed ERMF, CNR to CPR Highway 401 crossing, Ritson Road GO Station, Courtice Road GO Station, or Martin Road GO Station. Based on the Ministry of Tourism and Culture's standards and guidelines, no further archaeological assessment is recommended for these proposed construction parcels.

The Thornton Road GO Station site was found to contain one 19th to 20th century domestic site with potential for discrete mid-19th century archaeological deposits. This site was deemed potentially significant and recommended for further investigation through Stage 3 testing, involving detailed mapping, controlled surface collection within the agricultural field and hand excavation of one meter units throughout the site area, as well as additional archival research and a land registry review. If the site is deemed provincially significant following Stage 3 testing, Stage 4 mitigation of construction impacts would be required. Stage 3 testing was carried out in the fall of 2009. Since that time, the proposed layout for the GO Station site has been changed to avoid the site altogether.

If construction plans change to incorporate new areas that were not subject to assessment, Stage 2 field survey should be carried out prior to construction.

Proposed Mitigation Measures

There are outstanding archaeological concerns for the Rundle Road Layover Facility site area since access to property could not be obtained during this study. Construction should not be allowed to proceed prior to the completion of the archaeological fieldwork and receipt of Ministry of Tourism and Culture letter of reporting acceptance.

The original Thornton Road GO Station site layout was changed following the Stage 3 testing, which was conducted as a result of the discovery of a domestic site and the potential for archaeological deposits. The proposed GO Station site now avoids the archaeological site altogether, thus eliminating the need for other mitigation measures.

If construction plans change to incorporate new areas that were not subject to assessment, Stage 2 field survey must be carried out prior to construction. In keeping with legislative and policy stipulations, all construction-related impacts (e.g., machine travel, material storage, servicing and earth moving) must be restricted to areas that were archaeologically assessed and have been issued construction clearance by the Ministry of Tourism and Culture.

4.4.4 Rail, Road, Transit Networks

Potential Construction Impacts

The proposed improvements involve work directly within the CNR and CPR ROW's, which are currently utilized for freight services within and beyond the Project Limits. Construction operations within these ROW's have the potential to create rail traffic disruptions. GO Transit and its contractors will need to develop ways of constructing each facility within these ROW's that will minimize this disruption and meet with the railways agreement. During the structural work, there will be roadway delays/detouring measures implemented to ensure construction impacts are not negatively impacting motorists.

As noted above, Durham Region Transit (DRT) operates a series of bus services along the roadways that traverse the Project Limits. As a result of the proposed structural improvements, DRT services may be impacted during construction at the following roadways as construction of these roadways involve grade separations:

South Blair Street – potentially impacts Bloor Victoria 922 line
Thornton Road – potentially impacts GO Station (Thornton) 419 line and Durham College/UOIT 420 line

Proposed Mitigation Measures

In order to mitigate potential construction impacts, detailed traffic staging and management plans will be developed and provided to the Contractor in consultation in applicable regulatory agencies including municipal transportation departments and DRT during detail design. Additional traffic mitigation is prescribed above under **Section 4.4.2.3**. Ongoing consultation will also be maintained with CNR and CPR during detail design to ensure that freight services are minimally disrupted during construction activities.

Potential Operational and Maintenance Impacts

For those roads that exist and are presently grade separated this project will endeavour to fit the new tracks under or over these bridges and where needed will expand the bridges to accommodate the additional tracks. Where the existing roads are level crossings and presently protected by safety signal devices, these will be enhanced to accommodate the additional track and the additional safety devices required.

The rail corridor will be structured to make sure that the freight activity operates along the north side of the rail infrastructure and is not designed to conflict with the commuter system during normal operations. Although the rail network will be linked together at various locations the commuter track network is designed to remain separate from the freight activity during normal operations, including the operation of the stations. Only during disruptions will either system run in conflict with each other and this will be handled between operating groups from each service until rectified and returned to normal operations.

A traffic study has been carried out for each GO Station site to assess the impacts of the expected commuter road traffic coming and going from the future GO Station. This information will enable the development of solutions to address concerns regarding potential for congestion surrounding the stations. GO will continue to meet with municipal staff to address their concerns as they relate to potential impacts on the local road network, although they are not structured to fund municipal roadway improvement projects well beyond the limits of their stations. GO will fund the improvements shown on plans in this report, that include connections and in some cases access roads or traffic signals to the new GO Stations. Roadway improvements in the overall road network, beyond the station sites are typically justified by local growth in the general area and are the responsibility of each municipality.

In some cases, municipalities are reviewing their transit systems and determining what level of service they should provide to each new GO Station. GO Transit will work with municipal transit providers to accommodate this interface in the most effective manner.

4.4.5 Utilities

As is typical for all railway projects, utility crossings of the rail corridor will need to be protected for at least the length of the load bearing area or overhead length. This will require a full discussion with the owners and checking that they meet the requirements under their crossing agreement with the railway. Utilities which run along the rail corridors will also need protection by means of relocation or reinforcement as agreed to by the railways and the untility owner. For new sections of railway this protection will need to be provided prior to building the new grade. For all overhead utilities a verification with their correct clearance above the new track will be undertaken and those that need to will have to be raised according with their crossing agreements with CPR. If there exist special situations GO Transit will work with the providing utility to develop a plan that will ensure that this crossing meets the protections required.

4.4.6 Summary of Impact Assessment and Mitigation Measures

As detailed above, the proposed expansion of GO services from Oshawa to Bowmanville will result in some natural, socio-economic, cultural, and technical impacts during construction and following construction. **Table 4.6** summarizes the potential environmental issues/concerns associated with this project, identifies the impacts during construction, and recommends mitigation measures and prescribed future work/monitoring once the project has been implemented. It is noted that GO Transit will obtain all approvals, where applicable:

Table 4.6 Summary of GO Transit Service Expansion Potential Impacts and Mitigation Measures

Factor	Environmental Impacts During Construction/During Operations	Mitigation Measures	Future Work/Monitoring
		Note: GO Transit will obtain all approvals, where applicable.	

Drainage and Stormwater Management	• Potential flooding of the CNR to CPR Highway 401 crossing from a regional storm event.
	• Alterations to existing drainage patterns during and post-construction. Erosion and sediment migration or accidental spills into adjacent watercourses (i.e., Pringle Creek and Corbett Creek).
	• Increase in impervious surfaces on receiving watercourses following implementation of the proposed plan.
		• No mitigation required to address potential flooding as new structures (culverts and bridges) are designed appropriately to handle storm volumes based on CLOCA requirements
		• Direct all runoff and overland flows away from working areas and areas of exposed soils.
		• Store and handle all oils, lubricants, and other chemicals in accordance with MOE policies and other applicable provincial/federal regulations.
		• Refuel and maintain construction vehicles only in areas designated by the Contract Administrator preferably on a paved, impermeable surface, and more than 30 m from Pringle Creek, the Whitby Harbour PSW Complex, and Corbett Creek.
		• A Spill Response Plan shall be in place detailing the procedures to be followed in the unlikely event a spill were to occur. The Plan shall be developed in accordance with applicable legislation, and shall require a Spill Containment Kit consisting of, at least, absorbent materials to initially contain a spill, as well as protective gear for the handling of hazardous materials. The potential spills and hazards from the proposed rail line expansion to the water crossings and underground water sources will be re-visited at detailed design, and appropriate mitigation measures will be recommended.
		• Mulching and terraseeding of exposed soil.
		• Placing silt control at catchbasins.
		• All culvert works should be isolated from the watercourse and conducted in the 'dry'.
		• Placing silt fencing adjacent to slopes without sod or seed/mulch.
		• Installing silt fencing, rock check dams, and/or other appropriate measures in ditches where required in accordance with the *Erosion and Sediment Control Guideline for Urban Construction* (2006) and/or as specified in Contract Drawings.
		• Regular maintenance (clean-out) of ditches to minimize sedimentation build-up.
			• A Stormwater Management Plan will be developed in accordance with CLOCA during the detail design phase. The Plan shall detail stormwater management during construction activities as well as during operations and shall incorporate the MOE's Stormwater Management Planning and Design Manual (2003).
			• Further discussions will be held with CLOCA during detail design to confirm approvals required for construction/operation adjacent to watercourse features.
			• Stormwater Management Works including oil and grit separators, ponds and combination Best Management Practices (BMPs) will be incorporated into the design where warranted to facilitate with water quality within the CLOCA watersheds.
			• Alternatives for managing stormwater at Corbett Creek, including investigating the feasibility of introducing new culverts under CN rail will continue to be explored with landowners, GO and CLOCA.
			• Stormwater management issues will be addressed within the LEED design work for major facilities. It is noted that stormwater plans for stations will follow a treatment train approach, incorporating source controls (i.e., green roof, cisterns, permeable pavement) and the aforementioned end of pipe controls to the extent feasible.
			• The stormwater management pond at the ERMF will be designed to achieve the following:
			  • Enhanced (Level 1) water quality control;
			  • Extended detention of the runoff from a 25 mm storm for at least 24 hours; and
			  • Control of post-development peak flow rates to pre-development levels for the two (2) year through 100 year storm events.
			• The MOE requests that detailed stormwater plans for each proposed GO facility (i.e., ERMF, GO Stations, GO Layover, as well as the Highway 401 crossing) be prepared during detail design in full size drawings showing all of the catchment areas converging into the Oil and Grit Separators and/or ponds and other areas to drain into any neighbouring property without treatment and quantity control after the development. The drawings shall show among other things the 100-year flood line, future building facilities, land use parameters and land ownership, any water wells, stormwater and other utility pipes, swales and Municipal drains on the roadways and the ultimate received including indication of its size, area and depth.
			• During detailed design, the Flood Plain Mapping and flood storage areas will be refined and presented on full size drawing plates. Plans for a one year monitoring water quality program (prior, during and post construction) will also be prepared at the detailed design stage, and monitoring locations will be indicated on the drawing plates.
			• During detail design, the size, location and discharge points for all stormwater management ponds and best management practices will be finalized and presented on full size drawing plates. Plans for a one year monitoring water quality program (prior, during and post construction) including the location, frequency and parameters will also be prepared at the detailed design stage, and monitoring locations will be indicated on the drawing plates.

Factor	Environmental Impacts During Construction/During Operations	Mitigation Measures	Future Work/Monitoring
		Note: GO Transit will obtain all approvals, where applicable.	
			• Separate stormwater management reports will be prepared for the stations and major crossings will be prepared at the detailed design stage. The reports will include inspection and monitoring requirements, will address potential interference with adjacent wells, and will include the floodlines for adjacent regulated watercourses.
Fisheries	• Alteration of fish habitat during construction. • Debris entry to the stream during construction and in particular fill placement. • Indirect construction-related impacts (e.g., erosion and sediment migration to the streams, construction debris).	• To ensure the protection of Pringle Creek and Corbett Creek, heavy-duty sediment fencing should be installed to prohibit sediment from entering the creek. Hay bale check dams should also be installed in areas where there is water conveyance from the surrounding fields. • Due to the presence of coldwater species in Pringle Creek and Corbett Creek, in-water works construction should avoid the period from September 15th to July 1st. Consultation with CLOCA and MNR is required. • A 30 m vegetated buffer is recommended from top of bank to ensure the protection of Pringle Creek and Corbett Creek.	• Fluvial geomorphology studies should be conducted during detail design to assist with crossing structure design and channel restoration efforts (e.g., mitigate bank slumping) at Corbett Creek. • CLOCA has a Level III agreement with Fisheries and Oceans Canada (DFO). CLOCA will review the project in conjunction with the Level iii Agreements as per Section 35(1) of the *Fisheries Act*. CLOCA will confirm the appropriate timing windows during detail design and will assess all components of the project to determine whether there is a potential for the project to result in a Harmful Alteration, Disruption or Destruction of fish habitat (HADD) Metrolinx will work with CLOCA to ensure all appropriate mitigative measures are in place. • For areas where the rail tracks potentially cross Pringle Creek or Corbett Creek, culvert options should be ones with an open bottom. There may be restrictions set out by MNR/CLOCA regarding an acceptable culvert length. This should be further discussed with MNR/CLOCA.
Vegetation and Wildlife	• Decreased access/availability of forage due to vegetation clearing and compaction. • Clearing and damage of vegetation beyond the study area.	• Vegetation clearing zones and vegetation retention zones should be distinctly marked in both the Contract documents and the physical site itself to minimize the risk of unnecessary or inadvertent vegetation impacts and avoid incidental impacts as a result of temporary stockpiling, debris disposal and access. Works zones will be delineated in the field using construction fencing to minimize the area of disturbance and prevent disturbance of adjacent areas. • Appropriate vegetation clearing techniques (e.g., trees to be felled away from the retained natural areas) will be used to remove vegetation required for the proposed works). • All exposed surfaces will be re-stabilized and re-vegetated as soon as possible following construction, using an appropriate native seed mix.	• A re-vegetation plan will be developed for areas disturbed by the proposed works. • GO Transit or a pointed agent will be responsible for ensuring that all environmental mitigation and design measures are properly installed/constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required. • Metrolinx will obtain applicable approvals relating to tree removals including trees in designated hazard lands and park trees, as required.
	• Flight response/disturbance to avifauna. • Modification or loss of wildlife habitat. • Wildlife susceptibility or mortality due to construction activities. • Impacts on wildlife movement.	• The Contractor shall not destroy the active nests (nests with eggs or young birds), or wound or kill birds, of species protected under the *Migratory Birds Convention Act* and/or Regulations under that Act. All works will be complete in compliance with the *Migratory Birds Convention Act*. • Where feasible, timing constraints will be applied to schedule vegetation clearing and structure works (where birds may nest on a structure) outside of the breeding bird season (May 1st to July 31st). • If structure works cannot be scheduled outside the identified nesting season, ensure that bird nesting preventative measures (such as wire screens or tarps) are implemented to prevent new nesting prior to May 1st and are maintained until July 31st of the calendar year in which they were installed. At a minimum, the preventative measures will be installed at structures where evidence of past nesting was observed. These measures will be periodically checked, and maintained as required, so as not to entrap birds, and removed following construction when no longer needed. • Remove “inactive” nests (previous season, adult birds are not seen flying in and out of)	• If vegetation clearing cannot be scheduled outside the breeding bird season timing noted above, then GO Transit or a pointed agent will be employed to conduct a nest survey in the area to be cleared. The pointed agent identified by GO shall have completed a university or college education in a pertinent environmental discipline and shall have experience and/or training in the identification of birds and their nests and eggs as well as the assessment and development of appropriate mitigation measures to address the presence of migratory birds during construction. If active nests of migratory birds are located, then clearing must discontinue until after the breeding bird season (i.e., clearing is allowed August 1st to April 30th). This may involve delays to allow for fledging. • Bird friendly lighting and design will be incorporated where warranted to reduce the potential for birds to impact proposed facilities. • GO Transit or a pointed agent will be responsible for ensuring that all environmental mitigation and design measures are properly installed/constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required.

Factor	Environmental Impacts During Construction/During Operations	Mitigation Measures	Future Work/Monitoring
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		prior to construction, or prior to undertaking the preventative measures outlined above. • The bridge structure design will maintain existing wildlife movement opportunities. • Any wildlife incidentally encountered during construction will be protected and will not be knowingly harmed. As required, GO Transit or a pointed agent will capture and release any small wildlife (e.g., turtles, amphibians) stranded within the construction zone.	
	• Release fuels and other contaminants into natural areas. • Alterations in drainage patterns (e.g., surface runoff or groundwater flow).	• Temporary vegetation protection fencing should be installed to protect valley and riparian vegetation adjacent to work areas. The fencing should be secure and could necessitate the attachment of silt fencing for erosion control, depending on the circumstances within the site. • Erosion and sediment control measures will be designed, implemented and maintained throughout construction. This includes installing sediment and erosion control fencing along the edge of the required working area to protect the edges of all retained natural areas, as well as proper containment and filtering of all construction generated sediment (whether from dewatering or soil exposure from clearing and grubbing). • All construction-related debris will be appropriately contained during construction and cleaned-up and properly disposed of following construction. • All activity will be controlled so as to prevent entry of any petroleum products, debris or other potential contaminants/deleterious substances, in addition to sediment as outlined above, to natural areas. • No petroleum product storage, maintenance or refuelling of equipment will be conducted within these valleys. A Spills Prevention and Response Plan will be developed by the Contractor and spills cleanup materials will be kept on site at all times.	• GO Transit or a pointed agent will be responsible for ensuring that all environmental mitigation and design measures are properly installed/constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required.
Designated Natural Heritage Features	• There are no ESAs/ANSIs that would be impacted by the proposed facilities. • Soil disturbance/sedimentation to designated wetland features. • Impacts to unevaluated wetlands as well as the Whitby Harbour PSW Complex.	• See mitigative measures above relating to Vegetation and Wildlife Habitat and Drainage and Stormwater Management.	• Should the design require the removal of isolated wetlands, compensation measures in the form of wetland enhancement/restoration along the Whitby Harbour PSW Complex would be necessary. This should be discussed with CLOCA to establish the most appropriate compensation measure. • It will be demonstrated that there will be no negative impacts to the Whitby Harbour Wetland Complex during construction and operation activities. • GO Transit or a pointed agent will be responsible for ensuring that all environmental mitigation and design measures are properly installed/constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required. • CLOCA approval considering that work will be affecting small unevaluated wetland communities and potentially Corbett Creek Coastal Marsh. • The unevaluated wetland communities should be evaluated according to the Ontario Wetland Evaluation System for Southern Ontario (3rd edition).
Air Quality	• Increased dust during construction activities • Increase in emission factors CO, NOx, SO_2, PM and VOCs following implementation of the proposed GO facilities.	• Dust control measures and prevention of soils tracking by vehicles and personnel form construction site, including wetting of soil with potable water, reduced speeds for on-site vehicles, tire washing stations and restricting working areas in high wind conditions will be reviewed for inclusion in the contract package during detail design. • The local effects of the future build are limited to receptors closest to the proposed stations. The modelled impact and concentration levels greatly decrease with increasing distance	• The Contract Administrator will ensure that dust control measures in contract are adhered to during construction.

Factor	Environmental Impacts During Construction/During Operations	Mitigation Measures	Future Work/Monitoring
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		from the stations. Although there is an increase in local impacts, contaminant levels on a regional level will decrease due to commuters using the transit expansion. Furthermore the Future Build 2015 scenario will result in a decrease in the local concentrations of many contaminants such as NOx and Benzene.	
Human Health Risk Assessment	• See Air Quality above. • Increased diesel emissions arising from the planned expansion.	• See Air Quality above. • The most effective approach to improve local air quality throughout the GO Transit rail system would be the transition to Tier 4-compliant diesel vehicles by GO Transit as well as the continuation of provincial and federal initiatives that reduce ambient background concentrations of contaminants of concern in the GTA regional airshed overall.	• See Air Quality above.
Contaminated Properties	• Potential for encountering contaminated soils along existing CPR rail line.	• Construction Contract will include specifications to deal with contaminated soils in manner that satisfies MOE and GO/Metrolinx requirements. • A Soils Management Plan will be developed as part of detail design (i.e., site assessment or construction work). It will include provisions to characterize soils, determine suitability for proposed site use and address handling and disposal requirements for excess soils during construction.	• Contractor will be required to handle all contaminated soils in accordance with MOE standards.
Noise and Vibration	• Increased noise levels during construction operations that could potentially disrupt adjacent residential communities. • Increased noise levels following implementation of the proposed GO facilities beyond acceptable limits at the ERMF and the Rundle Road Layover Facility. • Wheel squeal noise could be significant at/near the curved sections of the new GO Transit rail tracks.	• It is recommended that the Contractor disseminate information to the general public regarding the planned construction activities, construction duration and project outcome within the Project Limits. Procedures should also be developed and implemented to receive and address noise and/or vibration complaints. • The Contractor is to adhere to the MOE's guidelines associated with construction equipment noise levels, which are outlined in NPC-115 Construction Equipment. Contractors should also adhere to the Ministry's noise guidelines NPC-118 and NPC-207, as well as any local municipal noise by-laws as established by the Town of Whitby, the City of Oshawa, or the Municipality of Clarington. • The installation of 5 m high noise barrier walls at the ERMF and the Rundle Road Layover Facility shall be considered based on administrative, operational, economic and technical feasibility. • Additional noise control measures (that may include physical and or administrative measures such as higher sound barriers) will be considered to reduce noise levels generated from the ERMF as well as the layover facility. • It is recommended that HVAC equipment be selected such that they are no larger in capacity than typical residential units (if feasible). The public address system should be limited during early morning or night-time hours, and the height and placement of the speakers will be confirmed during detail design and will include consideration of potential noise impacts, vulnerability to vandalism etc. Notwithstanding the above, the stations should be designed such that noise emitted from stationary sources complies with the requirements of MOE Publication NPC-205 or NPC-232, as applicable.	• Noise and vibration monitoring will be ongoing and such complaints will be dealt with appropriately. • Vibration impacts from construction activities may vary greatly depending on the construction methods employed and the location of the construction activities. Projects involving typical low impact construction equipment may be addressed adequately by means of a qualitative construction vibration assessment. However, projects employing high impact equipment should be addressed by means of a detailed quantitative construction vibration assessment. • Where construction will include high impact vibration activities, a construction vibration assessment shall be prepared prior to the start of construction to avoid structural damage to buildings and underground infrastructure. • Details of noise barriers at ERMF and Rundle Road layover will be confirmed during Detail Design. • GO Transit will consider rail squeal noise generation during the detailed design of this project since mitigation measures do exist for the abatement of rail squeal noise generated at curves and if warranted they should be utilized for this project. If the project is constructed without the benefit of rail squeal noise abatement measures GO Transit will implement a complaints and/or noise monitoring procedure to track incidences of rail squeal and install retrofit abatement measures should they be indicated as warranted due to complaints and/or noise levels.
Business and Economic Impacts	• Construction of the facilities may result in traffic delays and may disrupt businesses from conducting their daily routines. • Loss of agricultural lands that are currently being farmed as a result of the proposed GO facilities –	• Traffic detouring will be implemented during construction where applicable to ensure local traffic (including local traffic from adjacent businesses) is redirected as best possible to reduce negative impacts to the overall community. • Existing farming land leasing agreement terms will be reviewed and construction will be timed to minimize leasing conflicts where possible. Should additional land conflicts exist as	• A Communication Plan, which includes maintaining contact with regulatory agencies, utility companies, and members of the public on the master study mailing list to facilitate in minimizing additional business and economic impacts during construction, will be developed during detail design. • Any business complaints received during construction will be appropriately investigated

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	although these lands are in areas designated for future development. • Nuisance impacts to the adjacent business during construction and operations.	a result of breaching contracts, they will be dealt with during detail design through discussions with GO and property owners. • Additional mitigation related to noise and vibration construction impacts to adjacent businesses during and following construction are described above.	and resolved in an effective manner.
Traffic Impacts	• Increased traffic on local roads as a result of construction activities and detouring. • Increased traffic during operations as a result of four (4) new GO Train Stations.	• Metrolinx will work with municipalities to develop feasible traffic detouring/staging during construction. • Based on the completed traffic studies, several recommendations have been put forward (e.g., signalizing intersections, additional turning lanes) to improve LOS characteristics to roads adjacent to proposed GO Stations. Such recommendations will be further developed during the detail design stage.	• The Contractor will be required to prepare and submit traffic staging and management plans in consultation with municipalities, emergency services, adjacent businesses, and school bus transportation services during detail design. • The Contractor is to maintain consultation with regulatory agencies throughout construction and ensure traffic staging is proceeding according to plan. Should the Contractor decide to deviate from this plan, the Contractor will be required to prepare and submit a revised plan in consultation with the regulatory agencies. • Metrolinx will continue to work with businesses on Hopkins Street during detail design to ensure that truck traffic delays are minimal during construction of the ERMF. It is noted that opportunities for alternate traffic routes that serve the area exist and Metrolinx is committed to facilitating such opportunities where feasible.
Property Impacts	• Loss of property through implementation of the proposed plan. • Construction impacts to adjacent properties not to be acquired.	• Compensation for required properties will be provided at fair market value. • Additional property impacts as a result of the construction activities relating to air quality, noise, and/or vibration have been addressed elsewhere in this section. • The Contractor will be required to minimize any temporary impacts caused by construction to adjacent properties.	• Property negotiations will be made during detail design for a total of approximately 23 location properties within the Project Limits. • A monitoring program will be implemented prior to construction and will include a pre-condition survey of existing conditions and areas that warrant special consideration.
Cultural Environment	• There are outstanding archaeological concerns for the proposed Rundle Road Layover Facility site access to the site could not be obtained during this study. • The proposed Thornton Road GO Station site contained one 19th to 20th century domestic site and was recommended for Stage 3 testing.	• Construction should not be allowed to proceed at the proposed Rundle Road Layover Facility site prior to the completion of the archaeological fieldwork and receipt of Ministry of Tourism and Culture letter of reporting acceptance. • Stage 3 testing was conducted at the proposed Thornton Road GO Station site in the fall of 2009. Since that time, the proposed layout for the Station site has been changed to avoid the site altogether, thus eliminating the need for additional mitigation measures.	• If construction plans change to incorporate new areas that were not subject to assessment, Stage 2 field survey must be carried out prior to construction. In keeping with legislative and policy stipulations, all construction-related impacts (e.g., machine travel, material storage, servicing and earth moving) must be restricted to areas that were archaeologically assessed and have been issued construction clearance by the Ministry of Tourism and Culture.
Rail, Road, Transit Networks	• During the structural work, there will be roadway delays/detouring measures implemented to ensure construction impacts are not negatively impacting motorists. • Durham Region Transit (DRT) potential delays around South Blair Street and Thornton Road from construction of grade separations.	• Detailed traffic staging and management plans will be developed and provided to the Contractor in consultation in applicable regulatory agencies including municipal transportation departments and DRT during detail design. • The Construction Contract will include requirements regarding access to CP lands during construction. These will include items that ensure safety and minimize potential for disruption to CPR freight service.	• The Contractor will be required to prepare and submit traffic staging and management plans in consultation with municipalities, emergency services, adjacent businesses, and school bus transportation services during detail design. • The Contractor is to maintain consultation with regulatory agencies throughout construction and ensure traffic staging is proceeding according to plan. Should the Contractor decide to deviate from this plan, the Contractor will be required to prepare and submit a revised plan in consultation with the regulatory agencies. • The rail corridor will be structured to make sure that the freight activity operates along the north side of the rail infrastructure and is not designed to conflict with the commuter system during normal operations.
Utilities	• Disruption of utilities where they cross the rail corridor.	• Utility crossings of the rail corridor will need to be protected for at least the length of the load bearing area or overhead length. This will require a full discussion with the owners and checking that they meet the requirements under their crossing agreement with the railway. • For new sections of roadway this protection will need to be provided prior to building the	• Metrolinx/GO will work with affected utility companies to address all impacts in agreement with affected parties, including CPR

Factor	Environmental Impacts During Construction/During Operations	Mitigation Measures	Future Work/Monitoring
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		new grade. • For all overhead utilities a verification with their correct clearance above the new track will be undertaken and those that need will have to be raised according with their crossing agreements with CPR. If there exist special situations GO Transit will work with the providing utility to develop a plan that will ensure that this crossing meets the protections required and at the cost of whom.	

5. Other Approvals Required

The following sections outline the conventional municipal, provincial, and federal approvals required for the implementation of this type of project. In some cases, approvals may be required for land development and in other cases for the proposed infrastructure improvements. The relevance of the approvals will be confirmed in future study phases, when design details are confirmed and further impact analysis work is completed. Additional approval requirements may be identified in the future.

5.1 Municipal Approvals Required

The following municipal approvals may be required for the construction of a transit project. GO Transit will obtain all municipal approvals, where applicable:

- Planning approvals through the Town of Whitby, City of Oshawa and Municipality of Clarington;
- Building approvals for station works and the East Rail Maintenance Facility (ERMF) from the Town of Whitby, City of Oshawa and Municipality of Clarington;
- Central Lake Ontario Conservation Authority (CLOCA) approval for work within a regulated area;
- Approval for stormwater management in accordance with the Town of Whitby, City of Oshawa and CLOCA requirements;
- Sewer discharge approvals in accordance with the Town of Whitby, City of Oshawa and CLOCA requirements;
- Municipal Noise By-law exemptions;
- Official Plan Amendment, Town of Whitby and City of Oshawa;
- Rezoning Amendment, Town of Whitby and City of Oshawa;
- Urban Design Guidelines, Town of Whitby and City of Oshawa;
- Site Plan Approval, Town of Whitby and City of Oshawa;
- Tree-Cutting Approval, Town of Whitby and City of Oshawa; and
- Alterations to Heritage Properties, Town of Whitby and City of Oshawa.

5.2 Provincial Approvals Required

The following provincial approvals may be required for the construction of a transit project. GO Transit will obtain all provincial approvals, where applicable:

- Permit to Take Water will be required from the Ministry of Environment (MOE) if dewatering or diversion of flow from any of the watercourses by means of active pumping in excess of 50,000 litres per day will result from construction activities;
- Ministry of Tourism and Culture (formerly the Ministry of Culture) sign-off on proposed archaeological assessment documentation and agreement with findings of the additional documentation to be completed for heritage features; and
- In accordance with *Ontario Regulation 231/08* a notice to proceed must be obtained from the Minister of the Environment before the project can proceed to implementation;

5.3 Federal Approvals Required

The following federal approvals may be required for the construction of a transit project. GO Transit will obtain all federal approvals, where applicable:

- *Fisheries Act* Authorization from Fisheries and Oceans Canada (DFO);
- *Railway Safety Act* from Transport Canada; and
- *Navigable Waters Protection Act* approval from Transport Canada for watercrossings at navigable waters.

6. Monitoring and Future Commitments

6.1 Impact Monitoring

Impact monitoring is a necessary continuation of the construction and operational application of the Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility. It is designed to evaluate the need to review or update the Environmental Project Report (EPR), Detailed Design, etc., or to trigger the implementation of contingency plans that may include remedial measures needed to achieve the project goals and objectives.

A monitoring plan shall be prepared in accordance with Subsection 9(2)(8) of *Ontario Regulation 231/08*. The objectives of the monitoring plan are to:

- Augment existing information and databases, where required;
- Determine the accuracy of impact predictions and the effectiveness of environmental protection measures;
- Ensure compliance with federal, provincial and local legislation and regulations; and
- Ensure that Environmental Assessment (EA) commitments, plans and programs are carried out as planned.

In order to ensure EA commitments, plans and programs including prescribed mitigation are carried out as planned, project implementation monitoring will be documented on a seasonal basis for one (1) year after initial service commencement to document the degree of implementation of prescribed measures.

6.2 Operational Compliance/Impact Monitoring

GO Transit has standard procedures for spills management, accidents or malfunctions and track inspection. These procedures will be followed during the operations phase. For monitoring of the natural and social environment the following steps should be incorporated:

- Monitoring must be directed at fulfilling one or more objective sets, be subject to analysis and lead to potential actions;
- Monitoring should be for identifying problems, establishing a background reference, and evaluating the effectiveness of controls;
- Technology performance monitoring should be to confirm that the facility operates as designed, if not, determine if remedial design improvements are needed, or if it needs maintenance. This will assist in improving future designs;
- An ideal monitoring program should be directed at connecting impact analysis with technology performance assessment;
- The strategy should recognize and incorporate existing monitoring programs; and
- Reporting on results and taking appropriate follow-up action is a key component that fulfils due diligence expectations.

6.3 Future Commitments

Commitments to future work identified in this report will be completed prior to construction and consultation with stakeholders will occur as appropriate. Additional communications with government and non-government stakeholders will be required during detail design and construction. Meetings and discussions will be held during detail design with government agencies (e.g., CLOCA, MOE, MNR) to obtain required approvals. All municipalities will be contacted to finalize details concerning proposed alterations to municipal roads and road structures as well as municipal utilities. They will be kept apprised of proposed project staging and mitigation details as they are further developed during the design process. They will also be kept informed of progress as construction procedures.

Communication with non-government stakeholders (e.g. members of the public, business associations, etc.) will focus on the following activities, if required:

- Obtaining input on construction mitigation measures that affect the community:
  Communications with stakeholders will be held to identify local and site-specific issues so that specific mitigation measures can be developed to minimize impacts to the extent possible. This may include discussions on issues such as:
  - Construction access;
  - Temporary road closures;
  - Construction schedule; and
  - Critical community activities that may be affected.

Communication of project status and activities:

- A website will be developed to provide ongoing updates to facilitate communications during design and construction;
- Whenever construction activity impacts a residential or business area, advance notice will be provided to the residents and businesses within the zone of influence;
- Neighbourhoods will be kept updated on construction duration and progress; and
- Enquiries/complaints procedures.