

Richmond Hill Layover Facility Environmental Assessment (EA) and Preliminary Design

Contract Number ITC-2006-EN-002

AECOM

5080 Commerce Blvd, Mississauga ON Canada L4W 4P2
T 905.238.0007 F 905.238.0038 www.aecom.com

Date: August 2009



AECOM

5080 Commerce Boulevard, Mississauga, ON, Canada L4W 4P2
T 905.238.0007 F 905.238.0038 www.aecom.com

August, 2009

Project Number: E073-047

Mr. George Atikian, C.E.T.
Senior Project Officer, Engineering
GO Transit
20 Bay Street, Suite 600
Toronto, ON M5J 2W3

Dear Mr. Atikian:

Re: Environmental Study Report
Richmond Hill Layover Facility Environmental Assessment (EA) and Preliminary Design
Town of Richmond Hill, Town of Aurora and Town of Whitchurch-Stouffville

AECOM Canada Ltd. (formerly UMA Engineering Ltd.) was retained by GO Transit to undertake an Environmental Assessment (EA) and Preliminary Design Study for a new train layover facility along the CN Bala Subdivision. The study has also considered locations for new GO train stations. The limits of the Study Area extend from south of Major MacKenzie Drive to north of Aurora Road in the Towns of Richmond Hill, Aurora, and Whitchurch-Stouffville.

Please find enclosed 20 copies of the Environmental Study Report (ESR). The ESR documents the planning and consultation process carried out during the EA Study. Should you have any questions or comments regarding this report, please do not hesitate to contact the undersigned at (905) 238-0007.

Sincerely,
AECOM Canada Ltd.



Bill Hjelholt
Consultant Project Manager

SK :ls

Encl.

Statement of Qualifications and Limitations

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Revision Log

Revision #	Revised By	Date	Issue / Revision Description
1.	L. Sarris	March 6, 2009	Draft ESR (Version 1) - Lead Author
2.	S. Kapusin	March 6, 2009	Draft ESR (Version 2) - EA Review
3.	L. Sarris	March 23, 2009	Draft ESR (Version 3) - QC Review
4.	L. Sarris	May 27, 2009	Draft ESR (Version 4) - EA Update
5.	S. Kapusin	June 7, 2009	Draft ESR (Version 5) – EA/QC Review
6.	L. Sarris	June 10, 2009	Draft ESR (Version 6)
7.	L. Sarris/S.Kapusin	July 29, 2009	Final ESR (Version 7) – GO/QC Review

Signature Page

Report Prepared By:

Report Reviewed and Edited By:



Larry Sarris, B.E.S.
Consultant Environmental Planner



Sonya Kapusin, MCIP, RPP
Consultant Environmental Planner

Project Manager:



Bill Hjelholt
Consultant Project Manager

Executive Summary

GO Transit, the Province of Ontario's inter-regional public transit service for the Greater Toronto and Hamilton areas, is proposing to expand its facilities along the Richmond Hill rail corridor, which runs in a north-south direction on CN's (Canadian National) Bala Subdivision line. Currently the Richmond Hill corridor includes five (5) GO stations throughout its length, namely, Union, Oriole, Old Cummer, Langstaff and Richmond Hill (Major Mackenzie Drive). Currently, trains are "dead-headed" along the line to and from the Willowbrook Rail Maintenance Facility in Mimico, both during the morning and night. By definition, "dead-heading" is referred to the movement of empty trains (i.e., GO trains that do not carry passengers).

This study has considered the preliminary design for a new train layover facility, which will allow for up to six (6) 12-car trains to be stored overnight, which will improve overall transit service within the corridor. In addition, locations for future GO Train stations within the corridor have been considered. The limits of Study, referred to as the "Study Area Corridor" throughout the report, extends from 500 m south of Major Mackenzie Drive within the Town of Richmond Hill to 500 m north of Aurora Road within the Town of Whitchurch-Stouffville. The study limits initially extended from 500 m south of Major Mackenzie Drive to 500 m north of Bethesda Sideroad but were later extended following discussions with agency representatives, including the Regional Municipality of York, coupled with the recent *MoveOntario 2020* initiative.

This Environmental Study Report (ESR) has been prepared to fulfill the requirements of the GO Transit Class EA (Class EA) pursuant to the Ontario *Environmental Assessment Act*. The *GO Transit Class Environmental Assessment* document (2005) outlines a pre-approved, self-regulated planning process that can be used to plan, design, and construct GO Transit projects while meeting the requirements of the Ontario *Environmental Assessment Act*. The Class EA document identifies the construction and operation of a new layover facility and new train stations (of less than 12 ha) as a 'Group B' project. It is noted that this project may also require additional approval under the *Canadian Environmental Assessment Act*, which is to be confirmed during Detail Design.

GO Transit is proposing one (1) layover facility and two (2) GO Train stations within the Town of Richmond Hill. In order to ensure future GO services within the Town are streamlined and do not conflict with current CNR line operations, one (1) additional track is required on the east side of the CNR line, from Elgin Mills Road north to the future GO facilities. The CN Bala Subdivision line is owned by CN Rail (who leases track time to GO Transit). The additional track required for extending commuter service will be built by CN Rail and will be constructed within the CN Right-of-Way (ROW).

The purpose of this project is to improve GO Transit rail services throughout the Richmond Hill corridor. The purpose of the Class EA study is to identify and assess alternatives for a new train layover facility, including two (2) sites for a future GO Train station, along the CN Bala Subdivision in the Town of Richmond Hill, Aurora, and Whitchurch-Stouffville. This report documents the planning and decision-making process carried out as part of the Class EA study.

A detailed description of the existing environment within the Study Area Corridor provides the baseline conditions for assessing the negative environmental effects that could potentially arise from this Study. The assessment was

categorized under four (4) broad environmental criteria, namely the natural environment, socio-economic environment, transportation/technical environment and cultural environment.

Concept alternatives represent alternate ways to solve the on-going problems along the Richmond Hill line, which are identified above. The range of alternatives considered at this stage is as follows:

- Do nothing, that is continue to deadhead existing trains to the Willowbrook Facility in Mimico for overnight storage, without building a new facility;
- Store additional trains at an existing GO rail station within the Richmond Hill Corridor, with no expansion to the existing facility;
- Expand an existing GO rail storage facility to accommodate additional trains for storage; and
- Develop a new location and build new facilities within the Study Area Corridor for train storage and passenger (station) access.

Following an evaluation of the four (4) concept alternatives listed above, the preliminary preferred alternative was to develop a new location and build new facilities within the Study Area Corridor for train storage and passenger (station) access. At this stage of the EA (Stage 2), a first Public Information Centre (PIC) was held on June 26, 2007 to present and receive public/agency input on the above mentioned feasible concept alternatives. It was noted that overall, many participants agreed that improvements to the GO Transit rail service in Richmond Hill are required.

Following the preferred concept alternative, the preliminary design alternatives considered numerous sites along the CN Bala Subdivision line from north of Stouffville Road to south of Aurora Road on the east side of the CNR line. The alternative sites were evaluated based on four (4) broad environmental criteria, namely the natural environment, socio-economic environment, transportation/technical environment and cultural environment. As a result of this assessment, the preliminary preferred design alternative included the Bethesda Sideroad and Bloomington Road layover facilities and the Stouffville Road and Bloomington Road GO Train stations.

At this stage of the EA (Stage 3), a second Public Information Centre (PIC) was held on January 22, 2008 and January 27, 2008 within the Town of Whitchurch-Stouffville and the Town of Richmond Hill respectively, to present and receive public/agency input on the above mentioned feasible site alternatives. At the time of the PICs, two (2) alternate layover facilities were presented to receive public/agency input, which would facilitate in the confirmation of one (1) preliminary preferred layover facility. Overall, those in attendance at both PICs preferred the Bethesda Sideroad layover facility in comparison to the Bloomington Road layover facility, mainly for the fact that it has less of an environmental impact.

In addition, some PIC participants believed that based on current population trends, there was not a good justification to expand GO services further north of Bloomington Road (i.e., to Vandorf Sideroad and Aurora Road). Many PIC participants, however, were in agreement with the alternative GO Station sites at Stouffville Road and Bloomington Road. Shortly following the PIC, it was confirmed that the Bethesda Sideroad layover facility is preferred and will be carried forward to Detail Design, along with the Stouffville Road and Bloomington Road GO stations. Thus, the Stouffville Road GO station will be constructed first. At a time when the Stouffville Road GO station reaches capacity, which is anticipated to be in the near future, the Bloomington Road GO station will facilitate the expansion of GO

services further north. The construction of the additional CNR line, which is to be leased to GO Transit will be constructed during the same time as the GO facilities. Details regarding the preliminary design alternatives are outlined below.

Bethesda Sideroad – Layover facility

The Bethesda Sideroad layover facility is situated on the south side of Bethesda Sideroad, on the east side of the CNR line. An approximately 285 m access road will be designed on the existing unpaved private access road, which will take persons to the north side of the layover facility. The design layout of this facility will consist of six (6) yard tracks to store up to six (6) 12-car trains overnight, including a substation building located on the northern portion of the layover. A substation building is needed to house the electric power supply, while the adjacent wayside cabinet is where the trains will receive their electric power. This option includes an additional CN track leading to and from the layover facility.

Stouffville Road – GO station

The Stouffville Road GO Station is located on the north side of Stouffville Road, on the east side of the CNR line. The station will consist of a station platform, building, bus loop, “Kiss & Ride”, and up to 850 parking spaces (with opportunities for expansion). Access is provided from Stouffville Road, via an existing access road that currently services a seasonal recreational establishment. The access road leading to the site will connect to Gormley Road East, which is to be slightly realigned to the west and will include a signalized intersection. As this option includes an additional CN track leading to and from the station, it is noted that the CNR line overpasses Stouffville Road.

Bloomington Road – GO station

The Bloomington Road GO Station is located on the south side of Bloomington Road, on the east side of the CNR line. The station will consist of a station platform, building, bus loop, “Kiss & Ride”, and up to 700 parking spaces (with opportunities for expansion and a car pool lot). A storm water management pond, which is approximately 700 m², will be constructed on the south side of the bus loop. Access is provided from Bloomington Road via a grade separation over the Highway 404 on-ramp, which will need to be relocated. This option includes an additional future CN track leading to and from the station. The proposed access road will require relocation of the Highway 404 Ramp W-S for approximately 550 m.

The engineering characteristics for the Bethesda Sideroad layover facility will include a 40 m x 750 m yard immediately east of the CNR line. The site will also be constructed with an electrical substation building and transformer compound to distribute sufficient power for lighting and wayside power for the trains. Power will be provided by the local utility company. Individual wayside power cabinets will be provided for each train to maintain heating, air conditioning, lighting, and to support cleaning operations. Secondary facilities for the yard include a maintainer storage shed, maintenance shed, and a garbage bin pad and enclosure for disposal of refuse from the trains. The proposed design will also incorporate applicable storm sewers and subdrains.

The Stouffville Road GO Station will occupy approximately 12.7 acres while the Bloomington Road GO Station will occupy approximately 11 acres. Both sites will consist of a 2000 ft², single-storey structure containing ticketing kiosks and security, washrooms and a waiting area as well as a utility room and centralized electrical and mechanical rooms to

serve the project site. In addition, specific stormwater management strategies will be outlined for the sites as well as the inclusion of drilled wells in proximity to the station building for domestic water. Gas services will be obtained from the existing adjacent gas lines.

The Bethesda Sideroad layover facility will involve partial acquisition from the Town of Richmond Hill (including the Town’s Right-of-Way (ROW)), as well as a portion of a private property located south of Bethesda Sideroad. Partial property acquisition is also required from York Region’s ROW limits along Stouffville Road to provide access to the facility. In addition, partial acquisition from two (2) private properties will be required for the Stouffville Road site. It is noted that one (1) of the properties will be impacted as a result of the realignment of Gormley Road East, immediately south of Stouffville Road. The Bloomington Road GO Station will involve partial property acquisition from the Ministry of Transportation (including the Ministry’s ROW).

Construction activities would occur during the course of a calendar year. The current schedule anticipates that the work commences in March, 2010 and continues through to completion the following February. This progress hinges, however, on close coordination with the railway’s construction of the additional mainline track. Construction phases, works and activities are further outlined in **Section 7** of this report.

The overall schedule of this project is as follows:

Environmental Study Report	July, 2009
45-Day Review Period	August/September, 2009
Consultant Assignment	October, 2009
Detailed Design	October, 2009
Tender and Awarding	March, 2010
Construction Completion	May, 2011

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1. Introduction and Background

1.1 Background and Project Rationale

GO Transit's commuter rail and bus network is one of the most successful transit systems in Canada. For nearly 40 years, GO Transit has been providing safe, reliable, comfortable, convenient, and environmentally friendly transportation to the many communities it serves. It connects family and friends, helps people travel to and from work, and provides transportation for students, seniors, and recreational users (GO Transit website, 2009).

GO Transit started out in 1967 as a single rail line along Lake Ontario. Created by the Province of Ontario to relieve traffic congestion on the highways, GO Transit has become a comprehensive network of seven (7) train lines and numerous bus routes linking towns and cities across southern Ontario's Greater Toronto Area (GTA) and the adjacent City of Hamilton. GO Transit also provides service to the bordering communities of Simcoe, Dufferin, and Wellington Counties.

The Richmond Hill GO Transit Rail Corridor serves an area between Yonge Street and Highway 404, north of Toronto, and has experienced growth in ridership of more than 60% between 1996 and 2001, or approximately 10% per year (SNC Lavalin, 2002). From 1991 to 2006, the Town of Richmond Hill's population alone has more than doubled from 80,142 to 173,950. Since 2001, York Region's population has significantly increased from 759,660 to 933,350 in 2006 (York Region website, 2009). In 2004, the Government of Canada, the Province of Ontario, the GTA municipalities, and GO Transit formally agreed to fund GO Transit's multi-year expansion program to improve and expand its services in order to meet the growth in demand for commuter rail service.

Over the next 20 to 30 years, ridership will more than double if GO Transit has the capacity to carry the people. York Region's population is projected to increase from 933,350 in 2006 to 1,280,000 by 2026. The Town of Richmond Hill's population alone is projected to increase from 173,950 in 2006 to 219,000 by 2026. In 2007, the Ontario government announced *MoveOntario 2020*, a multi-year \$17.5 billion rapid transit action plan for the GTA and Hamilton that will build 902 km of new or improved rapid transit. The proposed extension of the Richmond Hill GO Transit rail corridor to Aurora Road was approved among GO Transit's 17 commuter rail initiatives.

1.2 Project Description

GO Transit is the inter-regional transit authority that provides commuter bus and rail service within the GTA. GO Transit has a contract with Canadian National (CN) to operate a regular commuter rail service using CN's Bala Subdivision between Richmond Hill and Union Station in downtown Toronto. GO Transit currently provides rush hour service between Richmond Hill and Union Station, with four (4) trains in the morning and five (5) trains in the evening.

GO Transit initiated this Class Environmental Assessment (Class EA) study to consider alternatives and suitable sites for a layover facility and train stations along the Richmond Hill GO Transit rail corridor. A layover facility eliminates "dead heading", which is the movement of empty trains, both morning and night, from remote overnight storage yards to the station at the end of a rail corridor. Currently, trains are dead headed from the Richmond Hill GO Station to the Willowbrook Rail Maintenance Facility in Mimico. In addition to wasted fuel, labour, and

equipment costs, dead heading wastes the very limited resource of track time. GO Transit must negotiate the use of track time with CN.

A layover facility would reduce overall train movements and subsequently permit future expansion of train services within the Richmond Hill corridor. New train stations are proposed to extend GO Transit train services further north within the Richmond Hill corridor, serving more riders from Richmond Hill and beyond.

1.3 The Class EA Process

1.3.1 GO Transit Class Environmental Assessment

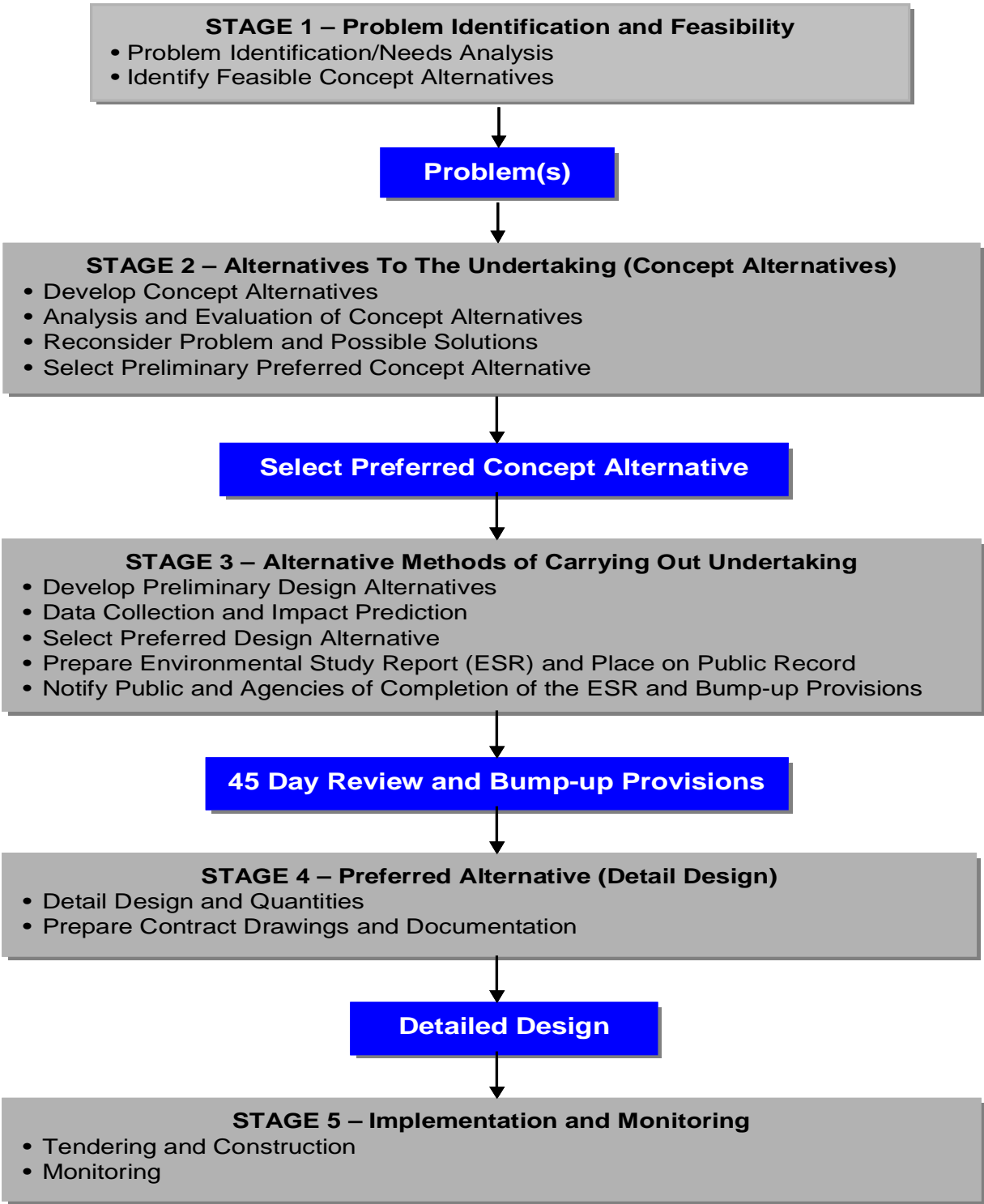
The *GO Transit Class Environmental Assessment* document (2005) outlines a pre-approved, self-regulated planning process that can be used to plan, design, and construct GO Transit projects while meeting the requirements of the Ontario *Environmental Assessment Act*. The Class EA document identifies the construction and operation of a new layover facility and new train stations (of less than 12 ha) as a 'Group B' project. As such, the Class EA study for the proposed layover facility and train stations along the Richmond Hill GO Transit rail corridor follows the planning and design process for a 'Group B' project as described in the *GO Transit Class Environmental Assessment* document. 'Group B' projects follow Stages one (1) to three (3) of the Class EA process as outlined in **Figure 1**. This process provides an opportunity for public and agency involvement throughout the Study and ensures documentation of the planning and decision-making process within an Environmental Study Report (ESR).

As discussed below, an additional track will be required north of Elgin Mills Road within the Town of Richmond Hill up to the preferred sites outlined in this ESR. The CN Bala Subdivision line is owned by CN Rail (who leases track time to GO Transit). The additional track required for extending commuter service will be built by CN Rail and will be constructed within the CN Right-of-Way (ROW).

1.3.2 Canadian Environmental Assessment Act

In addition to complying with the Ontario EA Act, 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. At the time of writing this ESR, it has not been confirmed whether the proposed undertaking will trigger a CEAA screening. Following further commitments to be conducted during the Detail Design stage, it will be determined whether there is federal interest in this Study. In such an instance, an EA pursuant to the CEAA would need to be completed prior to construction.

Figure 1. Class EA Process



1.4 Study Team

AECOM Canada Ltd. (formerly UMA Engineering Ltd.) was retained by GO Transit to complete the Class EA study and preliminary design for a new train layover facility, including selection of suitable sites for future GO Train stations. The Study Team is led by the following members:

GO Transit	Mr. George Atikian, Senior Project Officer
	Mr. Rick Howe, Project Coordinator (2006 to 2008)
	Mr. Greg Ashbee, Project Coordinator (2008 to 2009)
AECOM	Mr. Bill Hjelholt, Consultant Project Manager
	Mr. Cristian Huma, Consultant Project Engineer
	Mr. Andrew Ritchie, Consultant Environmental Planner (2006 to 2008)
	Ms. Sonya Kapusin, Consultant Environmental Planner
	Mr. Larry Sarris, Consultant Environmental Planner

1.5 Study Schedule

This Class EA study commenced in November, 2006, and was completed in April, 2009. Design and construction is scheduled following approval of the Class EA Study. The following dates have been tentatively scheduled and are subject to both the Class EA approval and property acquisition process:

Environmental Study Report	July, 2009
45-Day Review Period	August/September, 2009
Consultant Assignment	October, 2009
Detailed Design	October, 2009
Tender and Awarding	March, 2010
Construction Completion	May, 2011

* This schedule is subject to the permits/approvals discussed in **Section 6** and other field investigations to be conducted during Detail Design.

1.6 Report Organization

The planning process for the proposed new layover facility and future GO Train stations has been documented within this report. The information has been organized under the following categories:

Chapter 1	Introduction and Background
Chapter 2	Problem Statement and Study Area
Chapter 3	Existing Conditions
Chapter 4	Concept Alternatives
Chapter 5	Preliminary Design Alternatives
Chapter 6	Project Description
Chapter 7	Implementation and Monitoring

2. Problem Statement and Study Area

2.1 Problem Statement and Need for the Project

GO Transit trains and buses serve more than five (5) million people living in an area of more than 8,000 km². Getting these commuters onto transit greatly reduces congestion on the roads. By making room on the roads for people who need to drive, especially those involved in the movement of goods, GO Transit optimizes the area's transportation infrastructure (GO Transit website, 2009).

As noted in **Section 1**, the Richmond Hill GO Transit Rail Corridor serves an area between Yonge Street and Highway 404, north of Toronto, and has experienced growth in ridership of more than 60% between 1996 and 2001, or approximately 10% per year (SNC Lavalin, 2002). The Corridor experienced a 3.1% growth in ridership from 1,869,200 in 2004 to 1,926,600 in 2005. This growth has spurred GO Transit to commence implementation of the recommendations previously documented within planning studies completed in 1993 and 2002 (see **Section 2.2**). The need for this project is summarized in the following Problem Statements:

Layover Facility

Currently, trains are deadheaded from the Richmond Hill GO Transit Station to the Willowbrook Rail Maintenance Facility in Mimico. In the morning, trains travel empty from GO Transit's Willowbrook Facility in Mimico to the Richmond Hill GO Transit Station, north of Major Mackenzie Drive. In the evening, empty trains travel back from the Richmond Hill GO Transit Station to the Willowbrook Facility for overnight storage. In addition to wasted fuel, labour and equipment costs, this wastes the very limited resource of track time. The railway tracks are owned by CN and the use of tracks must be negotiated. As a result, the following issues have been identified with respect to GO Transit rail services in Richmond Hill:

- *Insufficient facilities available to meet the growth in demand for commuter rail services within and beyond Richmond Hill*
- *Need for long term storage of six (6) 12-car trains*
- *Restricted yard space available for expansion*
- *High deadhead mileage and costs*
- *Lack of track time available for deadhead train movement*
- *Limited suitably sized sites to locate a storage or layover facility, while simultaneously protecting sensitive natural and socio-economic features.*

A new layover facility is proposed to accommodate up to six (6) 12-car trains overnight, which would reduce overall train movements and subsequently permit expansion of train services within the Richmond Hill corridor.

GO Train Station

The Richmond Hill GO station has reached capacity. Consequently, the following issues have been identified:

- *Commuters have expressed their concerns with the amount of parking spaces available at the Richmond Hill GO Station and have requested additional opportunities*
- *Increased congestion to local roads as well as Highway 404 from travelling commuters who prefer to use the Richmond Hill GO Station over other stations. For example, it takes approximately one (1) hour for commuters to travel from the Aurora GO Station to Union Street on the Barrie line*
- *Insufficient space within the existing Richmond Hill GO Station to expand services*
- *Insufficient facilities available north of the Richmond Hill GO Station to meet the growth in demand for commuter rail services within and beyond Richmond Hill.*

Construction of new GO Transit stations would extend GO Transit train services further north, thereby providing service to more riders within and beyond Richmond Hill. Additionally, it will alleviate congestion at the current Richmond Hill GO Station.

2.2 Previous Studies

An Environmental Assessment (EA) Study was completed in 1993 for the expansion of GO Transit rail services within the Richmond Hill Corridor from the Oriole Junction to Bloomington Sideroad. The EA Study recommended an additional track throughout the length of the Corridor, which was approximately 31 km, including four (4) new stations recommended at John Street, Nineteenth Avenue, Stouffville Road and Bloomington Sideroad. In addition, an equipment layover site was recommended in the southeast quadrant of Bethesda Sideroad and the CN Bala Subdivision.

Recommended services along the CNR line involved the addition of three (3) trains to seven (7) trains in the peak direction in each of the morning and evening peak periods, plus the introduction of 90-minute bi-directional service in the off-peak period (Fenco MacLaren, 1993). This will result in the addition of approximately 34 commuter rail trains in the corridor on a daily basis.

A planning study was subsequently completed in 2002 to update the 1993 EA recommendations. The planning study confirmed the validity of the EA recommendations pertaining to railway plant upgrades within the Richmond Hill corridor. As noted therein, ridership data along the Richmond Hill line is provided for four (4) of the five (5) GO stations up to 2001. As noted within **Table 1** and **Table 2** below, the Richmond Hill GO station has the highest average daily ridership per year (train only) and the highest average daily growth in riders per year.

Table 1. Richmond Hill Line Average Daily Ridership per Year (Train Only)

Station \ Year	Oriole	Old Cummer	Langstaff	Richmond Hill	Total
1993	517	861	775	2,152	4,305
1994	517	862	775	2,154	4,308
1995	514	857	771	2,142	4,283
1996	524	873	786	2,183	4,366
1997	586	977	880	2,443	4,887
1998	652	1,086	977	2,715	5,430
1999	729	1,214	1,093	3,036	6,072
2000	757	1,261	1,135	3,152	6,305
2001*	811	1,352	1,217	3,381	6,761

* The average 2001 count occurred from January to October.

Table 2. Average Daily Growth of Riders per Station per Year

Station \ Year	Oriole	Old Cummer	Langstaff	Richmond Hill	Total
1994	0	1	0	1	3
1995	-3	-5	-4	-12	-24
1996	10	17	15	41	83
1997	62	104	94	260	521
1998	65	109	98	272	543
1999	77	128	115	321	642
2000	28	47	42	117	233
2001*	55	91	82	228	457

* The average 2001 count occurred from January to October.

This Class EA study builds on the EA recommendations as they relate to the construction of a single layover facility and new train stations within the Town of Richmond Hill, Aurora, and Whitchurch-Stouffville. The expectation is that this effort will lead to the goal of six (6) daily rush hour trains (morning and evening) and, ultimately, all-day service within the Richmond Hill GO Transit rail corridor.

2.3 Purpose of the Project

The purpose of this project is to improve GO Transit rail services throughout the Richmond Hill Corridor. The purpose of the Class EA study is to identify and assess alternatives for a new train layover facility, including sites for future GO Train stations, along the CN Bala Subdivision in the Towns of Richmond Hill, Aurora, and Whitchurch-Stouffville. This report documents the planning and decision-making process carried out as part of the Class EA Study.

2.4 Public and Agency Consultation

In 2006/2007, GO Transit mailed a **Notice of Study Commencement** to a list of regulatory agencies thought to be affected by or interested in the project. The list of regulatory agencies was updated during the study to ensure that it remained current. A list of agencies contacted throughout the study is provided in **Table 3**.

Table 3. Agency Contact List

Provincial Agencies	
<ul style="list-style-type: none">Ministry of Aboriginal AffairsMinistry of Agriculture, Food and Rural AffairsMinistry of Attorney GeneralMinistry of CultureMinistry of Economic Development and TradeMinistry of Environment	<ul style="list-style-type: none">Ministry of EnergyMinistry of FinanceMinistry of Municipal Affairs and HousingMinistry of Natural ResourcesMinistry of TourismMinistry of Transportation
Federal Agencies	
<ul style="list-style-type: none">Canadian Transportation AgencyEnvironment CanadaFisheries and Oceans Canada	<ul style="list-style-type: none">Indian and Northern Affairs CanadaTransport Canada
Municipal Agencies	
<ul style="list-style-type: none">Municipality of York Region (Regional Clerk, Infrastructure Planning, Emergency and Medical Services, Corporate Services, Transit, Transportation and Works)Town of Richmond Hill (Town Clerk, Fire, Engineering and Public Works, Planning and Development)	<ul style="list-style-type: none">Town of Aurora (Clerk, Fire, Public Works, Policy Planning, Planning and Development Services)Town of Whitchurch-Stouffville (Clerk, Fire, Public Works, Development Services and Building Division, Planning and Building Services)York Regional Police
First Nations	
<ul style="list-style-type: none">Alderville First NationChippewas of Mnjikaning First NationHiawatha First NationChippewas of Georgina Island	<ul style="list-style-type: none">Beausoleil First NationCurve Lake First NationMississaugas of the New Credit First NationMississaugas of Scugog Island First Nation
Key Stakeholders	
<ul style="list-style-type: none">Bell CanadaCN RailEnbridgeHydro OneOntario Hydro Services Company	<ul style="list-style-type: none">Rogers CableToronto and Region Conservation AuthorityLake Simcoe Region Conservation AuthorityYork Region District School BoardYork Region Catholic District School Board

The purpose of the **Notice of Study Commencement** was to inform agencies of the project and invite their participation in the Class EA Study. A copy of the notice is included in **Appendix A**, along with a table summarizing the comments received in response to the notice, and how those comments have been addressed as part of this Class EA Study.

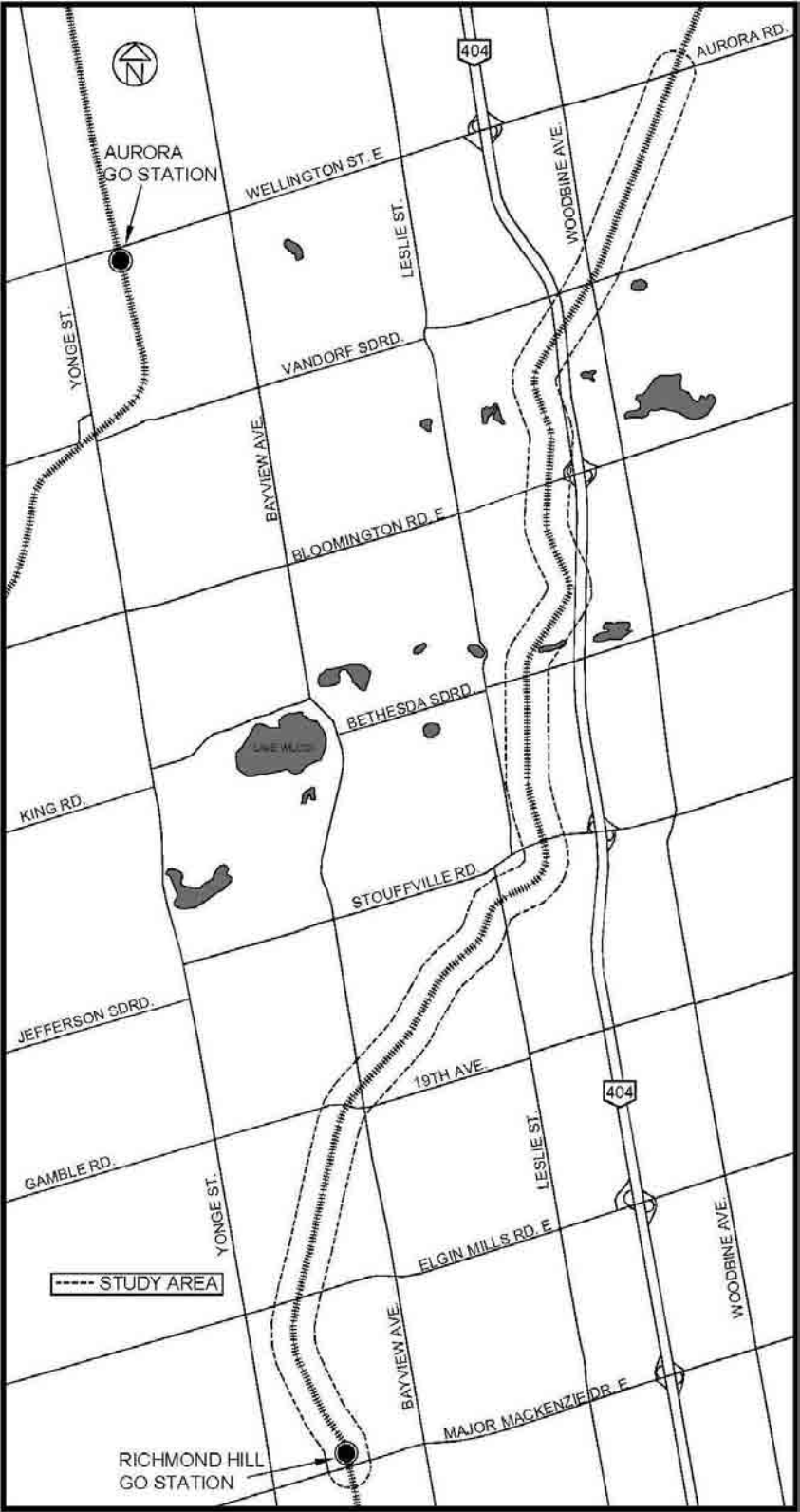
2.5 Study Area

As noted in **Section 1**, AECOM was retained by GO Transit in 2007 to complete the Class EA study and preliminary design for a proposed layover facility within the Richmond Hill GO Transit rail corridor. The Study includes the selection of suitable sites for future GO Transit train stations within the same corridor.

The Study Area Corridor is illustrated in **Figure 2**. The limits of the Study Area extend from 500 m south of Major Mackenzie Drive in the Town of Richmond Hill to 500 m north of Aurora Road in the Town of Whitchurch-Stouffville. The northern limit of the Study Area was extended from north of Bethesda Sideroad in Richmond Hill, based on comments received during Stage 2 of the Class EA and the opportunities introduced by the *MoveOntario 2020* initiative.

The Study Area Corridor forms part of the Richmond Hill GO Transit rail corridor. The Richmond Hill GO Transit rail corridor operates between the Bradford and Stouffville GO Transit Rail Corridors and includes five (5) stations throughout its length, namely Union, Oriole, Old Cummer, Langstaff and Richmond Hill. As illustrated in **Figure 2**, the Richmond Hill GO Transit Station is located at the southern limit of the Study Area Corridor.

Figure 2. Study Area Corridor



3. Existing Conditions

The following sections describe the existing environmental conditions for the Study Area Corridor. Each sub-section provides a brief description of the general corridor and a detailed description of the seven (7) sites considered during the assessment of the preliminary design alternatives. A full identification and description of the seven (7) preliminary design alternatives is detailed in **Section 5** of this ESR.

Secondary source information (e.g., maps, reports) were used to characterize the Study Area Corridor. Much of the data collected were obtained from provincial agencies, local area municipalities, local conservation authorities and geographic data sources. Other sources included:

- 1:50,000 scale National Topographic Series (NTS) maps - Map Sheet 30 M/14 and Map Sheet 31 D/3
- 1:10,000 scale Ontario Base Maps (OBMs)
- 1:63,360 Soils of Ontario Map for the Regional Municipality of York provided by the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA)
- Soil Survey of York County (1955)
- 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
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC) website
- Species at Risk in Ontario website
- Fisheries and Oceans Canada (DFO) 2008 Aquatic Species at Risk Mapping
- Local and Regional Official Plans including applicable Zoning By-Laws.

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 Study Area Corridor from south of Major Mackenzie Drive to north of Aurora Road is situated entirely within the Blue Mountain geological formation. This formation includes a primary lithology of dark blue-grey to brown to black shale, with thin interbeds of limestone or calcareous siltstone (Armstrong and Dodge, 2007).

The Study Area Corridor is situated within four (4) physiographic regions known as the Peel Plain, South Slope, Oak Ridges Moraine and Schomberg Clay Plains. Details regarding the locations of each physiographic region are outlined below.

Peel Plain

The southern limits of the corridor from south of Major Mackenzie Drive to just south of Elgin Mills Road East is situated within the Peel Plain Physiographic Region. The Peel Plain is considered a level-to-undulating tract of clay soils that covers an area of approximately 776 km² and encompasses the Regional Municipalities of York, Peel and Halton (Chapman and Putnam, 1984). The characteristics of this region include a gradual uniform slope to Lake Ontario resulting from extensive glacial activity, which occurred in the late Wisconsinan substage

approximately 12,000 to 23,000 years ago and was marked by the repeated advance and melting of massive, continental ice sheets.

Although this area is now almost completely deforested due to progressive developments, there is evidence that this plan once supported a high quality hardwood forest consisting of a great wealth of species. Additionally, until 1940, almost all of the land was used for agricultural related purposes; farms averaged approximately 100 acres in size. However, since the 1940's, additional development has cleared over 130,000 acres of farmland, and it appears that a similar fate is ahead for the remaining farmland (Chapman and Putnam, 1984).

South Slope

The South Slope Physiographic Region extends from Elgin Mills Road East to just south of the Bloomington Road/Highway 404 interchange area. Thus, the sites considered for the Stouffville GO station as well as the Bethesda layover facility is situated within this physiographic region. The South Slope is the southern slope of the Oak Ridges Moraine but also includes the south strip of the Peel Plain. It rises to the line of contact with the moraine from approximately 245 metres above sea level (masl) to approximately 305 masl. Additionally, the slope consists of soils that have been developed on tills, which contain some shale as well as a mix of materials ranging from clay particles to boulders.

Oak Ridges Moraine

The Oak Ridges Moraine Physiographic Region extends from south of the Bloomington Road/Highway 404 interchange to immediately south of Aurora Road on the east side of the CNR line within the Study Area Corridor. This region encompasses the sites considered for the Bloomington Road GO station, the Vandorf and Aurora Road GO stations and the Bloomington Road and Aurora Road layover facilities.

This landform is a provincially significant prominent upland area that runs through south central Ontario, extending from Lake Scugog in the east to the Niagara Escarpment in the west. The moraine was formed by glacial action between two opposing ice lobes within the last one million years. This landform covers a total length of approximately 160 km and represents the surface water divide between Lake Ontario and Georgian Bay. The moraine forms a west-east trending belt of undulating, kettle topography that varies between 5 km and 20 km in width. As a result of urban growth, the undeveloped portion of the moraine in the vicinity of Yonge Street within the Town of Richmond Hill has been constrained to a minimum 3 km width (Geomatics International Inc., 1999).

Schomberg Clay Plains

This physiographic region tips the northern limit of the Study Area Corridor mainly on the west side of the CNR line from immediately south of Aurora Road to beyond the northern Study Limits. The Schomberg sediments are defined as varved clays with annual layover of two (2), three (3), four (4) or more inches of thickness (Chapman and Putnam, 1984). Additionally, this region contains well-drained Schomberg silty clay loam, the imperfectly drained Smithfield silty clay loam and the poorly drained Simcoe silty clay and silt loams. The original vegetation within this region was hardwood forest including sugar maple, black maple, beech, ironwood and basswood. Those areas identified by imperfectly drained to poorly drained soils were dominated by elm, ash, soft maple and white cedar (Chapman and Putnam, 1984).

Physiographic mapping (1:253,440) of the Study Area Corridor identifies four (4) physiographic formations, which include:

- **Bevelled Till Plains:** the southern limits of the Study Area Corridor, immediately south of Elgin Mills road are confined by the Peel Plain Physiographic Region including the Bevelled Till Plains.
- **Till Plains:** the area is primarily comprised of drumlinized till plains within the extent of the South Slope Physiographic Region. These till plains are located from north of Elgin Mills Road to south of Bloomington Road.
- **Kame Moraines:** the area from just south of the Bloomington Road/Highway 404 interchange to just south of Aurora Road is within the Kame Moraines. This physiographic formation is situated within the Oak Ridges Moraine Physiographic Region.
- **Clay Plains:** as noted above, the Schomberg Clay Plains inhibit this physiographic formation, specifically north of Aurora Road within the corridor.

Given the physiography of the Study Area Corridor, the overall topography slopes gradually towards the south. From just south of Major Mackenzie Drive, the elevation adjacent to the CN Bala Subdivision is approximately 223 masl and continues to increase in a northerly direction to approximately 250 masl at the 19th Avenue/CN Bala crossing. The topography north of the Stouffville Road/CN Bala crossing is approximately 278 masl. It is noted that the CN Rail line crossed over Stouffville Road, however at this crossing Stouffville Road is approximately 6 masl lower than the CN track. Along the east side of the CN Bala line, within the Stouffville Road GO station site, topography gently slopes in an eastward direction at approximately 278 masl at the rail line to approximately 272 masl at the existing access road.

From the Stouffville Road GO station site to the Bethesda Sideroad layover site, the topography gently inclines to approximately 292 masl. The topography at the Bloomington Road GO station site is approximately 302 masl. Of note however is the CN Bala rail line, which is approximately five (5) masl higher than the adjacent GO station. Additionally, the elevation of Bloomington Road at the underpass to the rail line is approximately 302 masl, while the Bloomington Road layover site is situated on a higher elevation at approximately 308 masl.

Continuing in the northern direction to the Vandorf GO station site, the topography gently declines to approximately 298 masl just north of Vandorf Sideroad on the east side of the CN Bala Subdivision. The lands generally remain flat within the Vandorf station footprint with the exception of the CN Bridge over Vandorf Sideroad, which is mapped at approximately 302 masl. Within the northern limits of the Study Area Corridor, including the Aurora Road GO station and layover facility, the topographic features are generally flat with an elevation of approximately 297 masl.

3.1.2 Soils and Agricultural Capability

Soils within the former York County are documented within the *Soil Survey of York County - Report No. 19 of the Ontario Soil Survey* (Hoffman and Richards, 1955). Review of the *Soil Survey of York County* (1955) indicates that there are 17 major soil types within the Study Area Corridor. The soils within the Study Area Corridor are associated with the deposits of the Oak Ridges Moraine. **Figures 3(a) (b) (c)** in correlation with **Table 4** identify the 17 soil types within the Study Area Corridor and their respective Canada Land Inventory (CLI) soil classifications.

Generally within the Study Area Corridor, those lands situated south of Stouffville Road have been significantly altered from an agricultural perspective as progressive residential/commercial growth within the Town of Richmond Hill has significantly reduced the amount of agricultural lands. Thus, as illustrated in **Figure 3(a)**, the

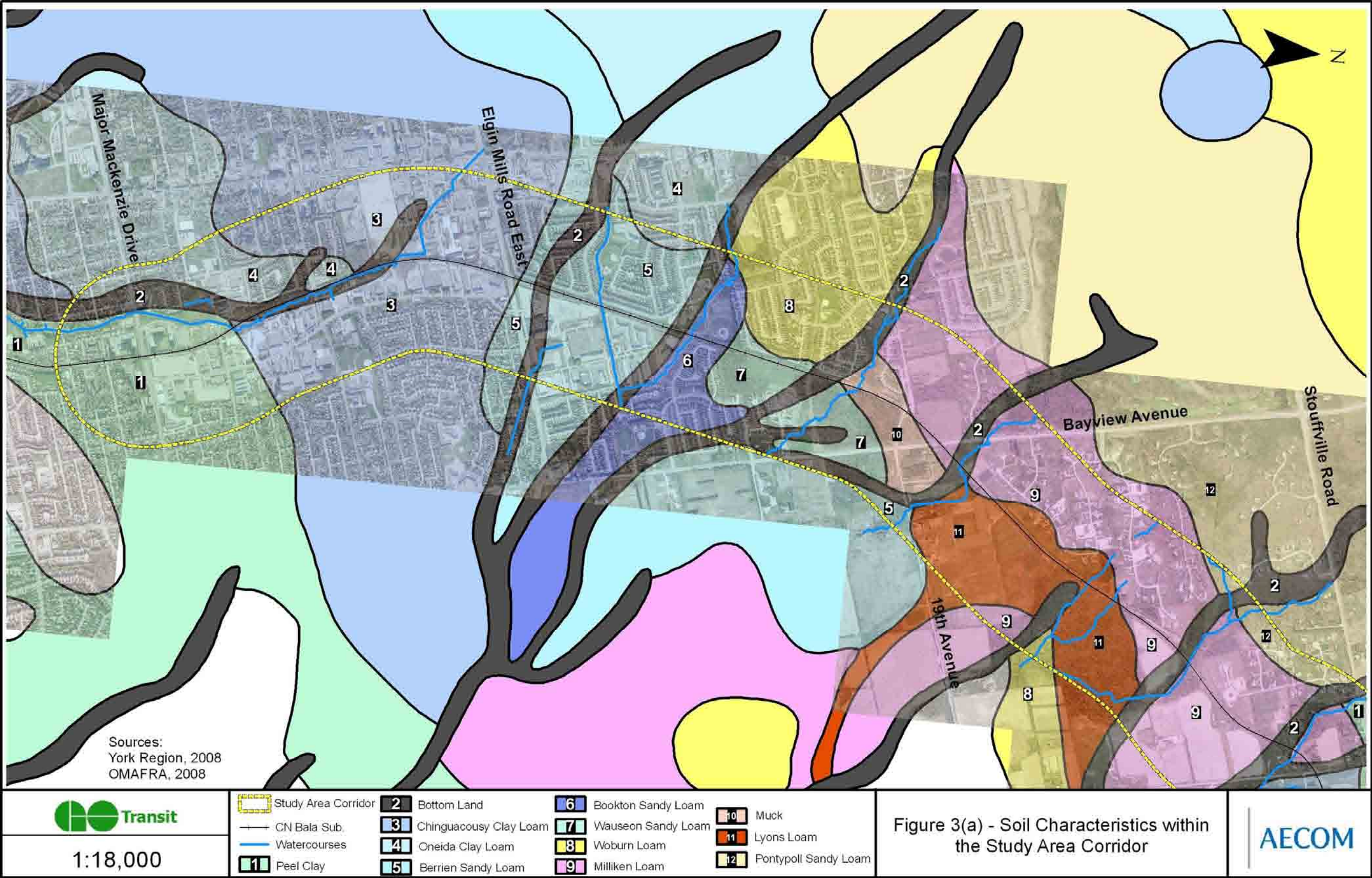
majority of agricultural potential cannot occur south of Stouffville Road. However, the presence of these soils may currently support a range of coniferous and/or deciduous tree species.

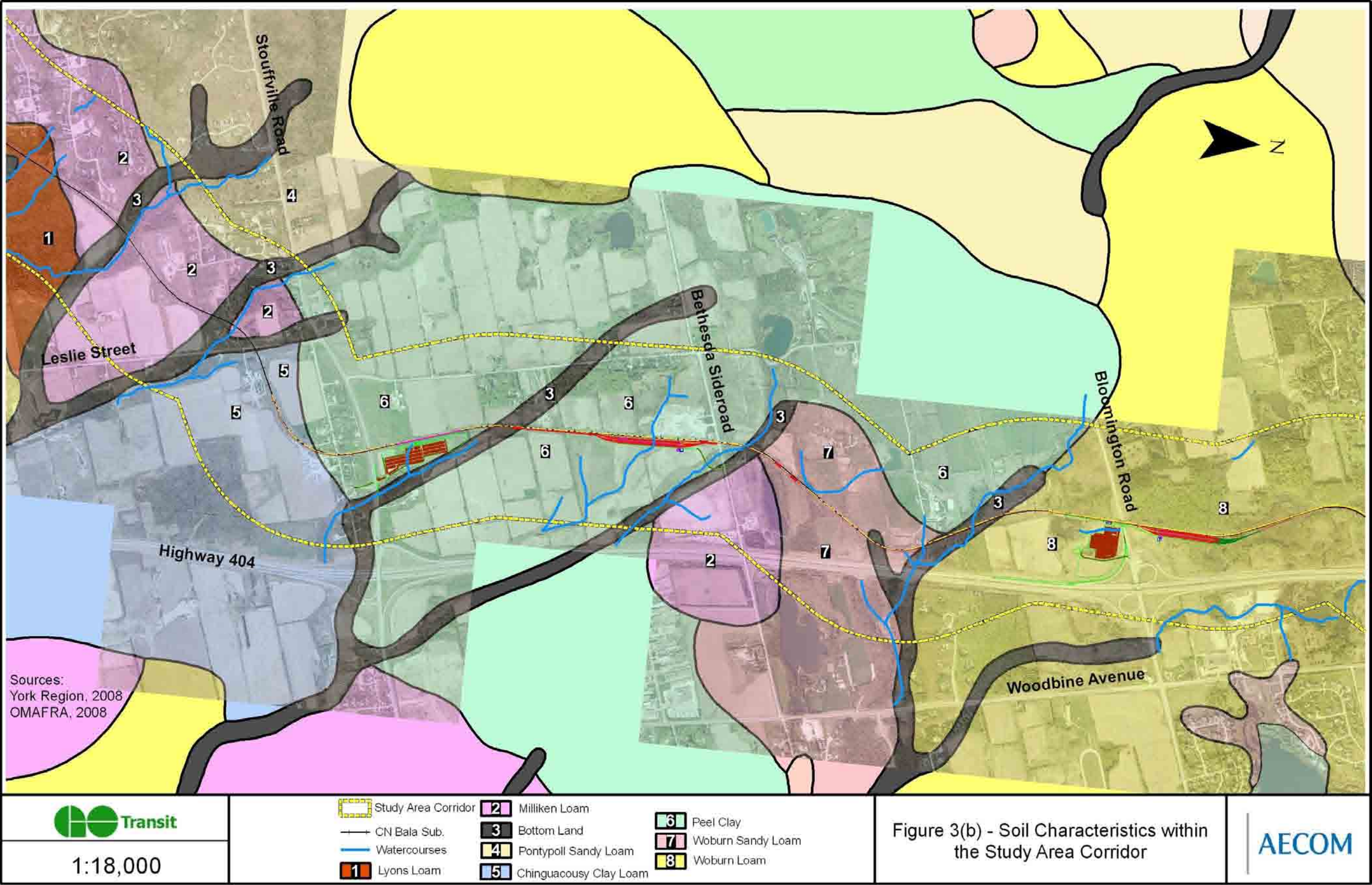
Table 4. Soil Characteristics within the Study Area Corridor

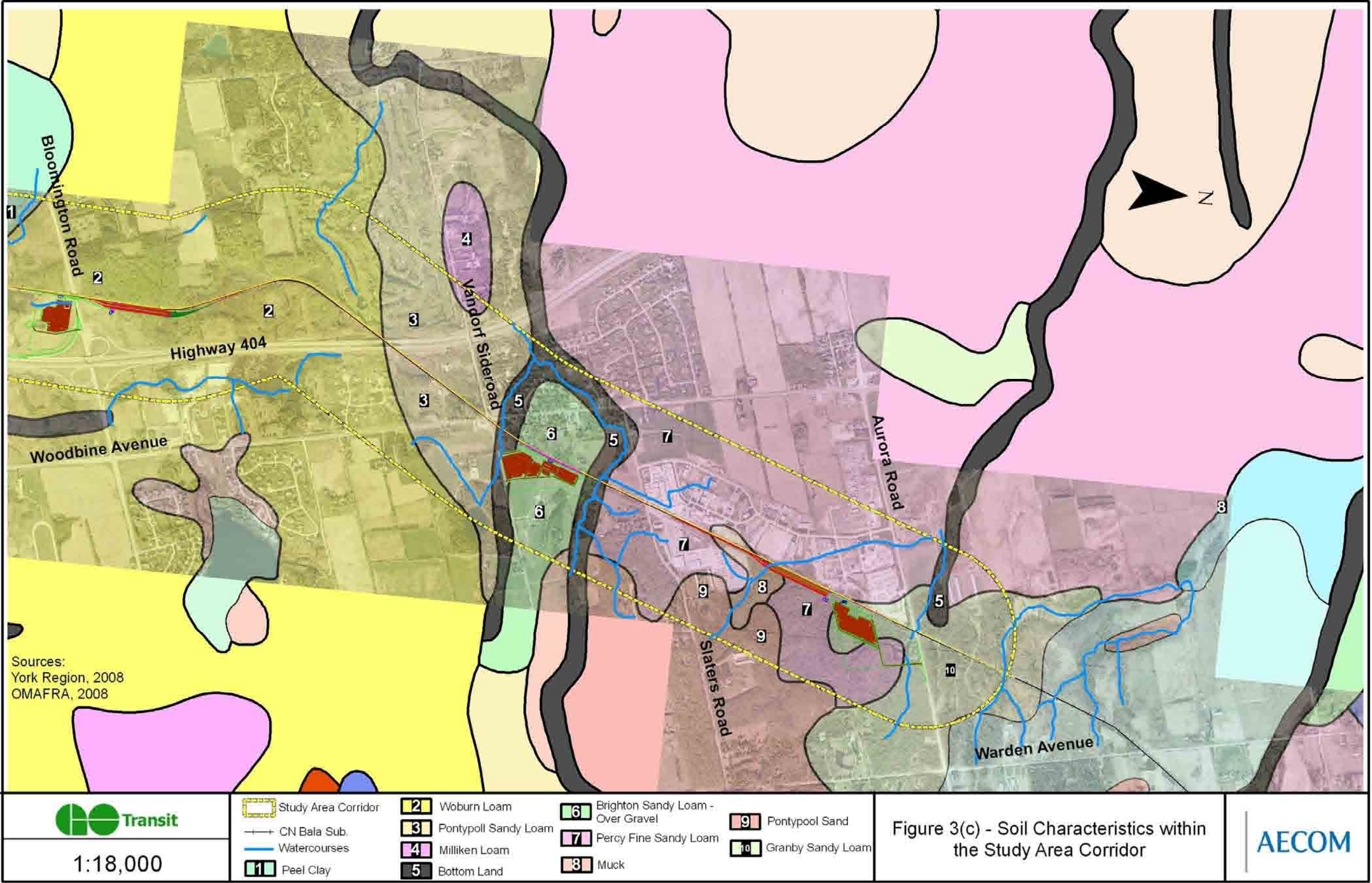
Soil Type	Soil Description	Canada Land Inventory (CLI) Classification
Peel Clay	Peel Clay soils are imperfectly drained and are formed largely from stonefree lacustrine materials. This soil type is considered neutral to slightly acid with clay till appearing at depths of less than three (3) feet. The natural vegetation within this soil type consists of soft maple and elm. These soils are well suited to the production of cereal grains, hay and pasture as the surface is fairly high in organic matter and plant materials. The most common agricultural practice on these soils was dairy farming; however this soil type is also suited for cash crops including corn and flax. As illustrated within Figure 3(b) below, the sites considered for the Stouffville Road GO station and Bethesda Sideroad layover facility are entirely mapped on Peel Clay soils.	CLI 1 – Soils have no significant limitations in use for crops and are very productive. These soils are considered deep, are well to imperfectly drained and hold moisture well.
Bottom Land	Bottom Land soils are interspersed throughout the Study Area Corridor. These soils are normally mapped in areas surrounding watercourses and other water bodies. The Bottom Land soils are described as alluvial deposits with variable drainage. Bottom Land soils are typically found in flood-prone areas and can be used for pasture (Hoffman and Richards, 1955). As illustrated within Figure 3(c) below, a portion of the Vandorf Sideroad GO station site is situated within Bottom Land soils.	CLI 5 – Soils have very severe limitations in use for crops and require special conservation practices. These soils are capable of producing native or tame species of annual forage plants.
Chinguacousy Clay Loam	Chinguacousy Clay Loam soils are imperfectly drained and consist of fairly high limestone and shale. The topography is considered smooth gently sloping with slight erosion, with natural vegetation consisting of elm and soft maple with evidence of ash and oak. From an agricultural perspective, these soils are predominately used for dairy farming but are well suited for cereal gains and forage crops, with some alfalfa depending on drainage and acid reaction. Additional cash crops including wheat, corn, beans and tomatoes can be grown within this soil type.	CLI 1 – Soils have no significant limitations in use for crops and are very productive. These soils are considered deep, are well to imperfectly drained and hold moisture well.
Oneida Clay Loam	This soil series is characterized by good drainage and smooth moderately sloping topography, which is a result of the presence of adjacent watercourses. Although current land uses within this soil series include urban development, this soil series is capable of supporting several tree species including oak, sugar maple, pine, beech and elm. From an agricultural perspective, the Oneida Clay Loam is used for dairying and general farming purposes as the soil is well adapted to cereal grains, hay and pasture.	CLI 1 – Soils have no significant limitations in use for crops and are very productive. These soils are considered deep, are well to imperfectly drained and hold moisture well.
Berrien Sandy Loam	The Berrien Sandy Loam soil series are imperfectly drained with an overall topography of smooth gently sloping. The natural vegetation within this soil series consists of soft maple, elm and ash. Coniferous species including hemlock, cedar and spruce may also be present. Agriculturally, this soil series can support cash crops including oats, hay and pasture as well as dairy farming (Hoffman and Richards, 1955).	CLI 2 – Soils have moderate limitations in use for crops and require moderate conservation practices. These soils are considered deep and hold moisture well and can be managed with little difficulty.
Bookton Sandy Loam	Bookton Sandy Loam soils are well drained soils with smooth gently sloping to smooth moderately sloping topography. The natural vegetation within the soil series consists mainly of hard maple, beech and spruce. This soil series also supports general farming practices including the production of cereal grains, hay and pasture as well as dairying. Some vegetables, tree fruits and small fruits may also be grown in this soil series.	CLI 2 – Soils have moderate limitations in use for crops and require moderate conservation practices. These soils are considered deep and hold moisture well and can be managed with little difficulty.
Woburn Loam	Woburn Loam soils are characterized by good drainage and occur on smooth moderately sloping topography with some isolated steep slopes. This soil series is susceptible to sheet erosion, however can support forested areas including beech and hard maple with some basswood, ironwood and soft maple occurring in lesser amounts. Woburn Loam is primarily used for general farming practices including cereal grain, corn and legumes. As illustrated within Figure 3(b) below, the Bloomington Road GO station site and the Bloomington Road layover site are entirely mapped on Woburn Loam soils.	CLI 1 – Soils have no significant limitations in use for crops and are very productive. These soils are considered deep, are well to imperfectly drained and hold moisture well.
Wauseon Sandy Loam	This soil series is characterized by poor drainage and typically occurs on level to depressional topography. Moreover, the run-off is very low and the permeability is slow. The natural vegetation within this soil series consists of elm and aspen with some evidence of soft maple, willow, white cedar and ash. As noted within Figure 3(a) , this soil series supports a small woodlot on the east side of the CN Bala Subdivision immediately south of 19 th Avenue. Agriculturally, this soil series supports permanent pasture and woodland and is not well suited for the production of most farm crops.	CLI 3 – Soils have moderately severe limitations, which restrict the range of crops. Thus, they affect one (1) or more good farming practices.
Milliken Loam	Milliken Loam soils are considered imperfectly to moderately well drained with a smooth gently sloping to smooth moderately sloping topography. Tree cover within this soil series includes elm and soft maple, as well as ash and some hard maple woodlots. This soil series is present within the environmentally significant woodlot known as the Jefferson Forest, which is a regional Area of Natural and Scientific Interest (ANSI). Although there are no crops within this soil series, general farming including cereal grains, corn and hay as well as dairy farming may be supported.	CLI 1 – Soils have no significant limitations in use for crops and are very productive. These soils are considered deep, are well to imperfectly drained and hold moisture well.
Muck	Muck soils are very poor drained soils comprised of well decomposed organic materials, which are very dark in colour. Muck soils typically represent depressional topography with vegetation consisting of elm, ash, white cedar and sedges. As Muck soils are high in nitrogen and low in potassium, some specialized crops can occur in the area where they can be drained and irrigated. As illustrated within Figure 3(c) below, a portion of the Aurora Road layover site is mapped on Muck soils.	CLI 0 – Not placed in capability classes.

¹ The CLI categorizes soils into seven (7) classes which reflect the soil's capability to produce field and forage crops (Department of the Environment, 1972). Lands classified as Class 1 are considered to have the highest capability or potential, while those classified as Class 7 are considered to have the lowest potential. The classification system reflects limitations such as slope, topography, soil depth, climate, drainage and stoniness, among others.

Soil Type	Soil Description	CLI Classification
Lyons Loam	Lyons Loam soils are characterized by poor drainage and occur in woodlands where the most frequently occurring trees are elm, ash, cedar, willow, soft maple and hemlock. This soil series is also situated within the Jefferson Forest, on the east side of the CN Bala Subdivision. Such areas not in woodland are often farmed for pasture.	CLI 2 – Soils have moderate limitations in use for crops and require moderate conservation practices. These soils are considered deep and hold moisture well and can be managed.
Pontypool Sandy Loam	This soil series is characterized by well drained to excessively drained soils on irregular steeply sloping topography. Natural vegetation can support hard maple, beech and spruce trees. From an agricultural perspective, this soil series can support some cash crops including potatoes, peas, tomatoes and corn under soils that are heavily fertilized. However, crop production is limited by low fertility and susceptibility to wind erosion. Due to low fertility levels, this soil type is well suited for cereal grains, hay and pasture.	CLI 6 – Soils are only capable of producing perennial forage crops. Soils provide some sustained grazing for farm animals, but limitations are very severe.
Woburn Sandy Loam	See Woburn Loam. Woburn Sandy Loam differs from Woburn Loam only in the texture of surface horizons.	CLI 1 – Soils have no significant limitations in use for crops and are very productive. These soils are considered deep, are well to imperfectly drained and hold moisture well.
Brighton Sandy Loam – Over Gravel	Brighton Sandy Loam soils are well drained and have a smooth gently sloping topography. Such soils are well drained because the porosity of the materials facilitates the rapid percolation of moisture. Although most woodlots have been removed, this soil type supports such tree species including beech, sugar maple, pine and oak. From an agricultural perspective, low natural fertility limits the soil capabilities however such cash crops including potatoes, corn and peas can be grown with proper fertilizers. Additionally, there are gravel stones present in this soil type within the A and B soil horizons. As illustrated within Figure 3(c) below, a portion of the Vandorf Sideroad GO station site is mapped within this soil type.	CLI 2 – Soils have moderate limitations in use for crops and require moderate conservation practices. These soils are considered deep and hold moisture well and can be managed.
Percy Fine Sandy Loam	This soil series is characterized by good drainage that retains moisture and has a smooth gently sloping to moderately sloping topography, which is moderately susceptible to sheet erosion. As current land uses support forest cover, this soil series supports sugar maple, beech and a few basswood tree species. Agricultural land uses within this soil type support general farming and dairying. Additionally, the soil has adapted to the growth of wheat, oats, barley, alfalfa, hay and pasture. As illustrated within Figure 3(c) below, a portion of the Aurora Road GO station and layover sites is mapped within this soil type.	CLI 1 – Soils have no significant limitations in use for crops and are very productive. These soils are considered deep, are well to imperfectly drained and hold moisture well.
Pontypool Sand	See Pontypool Sandy Loam. Pontypool Sand is very susceptible to wind erosion and has a lower natural fertility in comparison to the Pontypool Sandy Loam.	CLI 6 – Soils are only capable of producing perennial forage crops. Soils provide some sustained grazing for farm animals, but limitations are very severe.
Granby Sandy Loam	Granby Sandy Loam soils are characterized by very slow drainage with topography of smooth very gently sloping to level. Existing land uses within this soil series identifies the presence of forested areas within a Wetland Complex known as Bogart Creek. Such tree species can include elm, ash and cedar with seasonal growth of willow and aspen poplar in some areas. From an agricultural perspective, these soils are used to support permanent pasture or trees; however the soils can be used to support short season crops including buckwheat. As illustrated within Figure 3(c) below, the majority of the Aurora Road GO station site is mapped within this soil type.	CLI 4 – Soils have severe limitations, which restrict the range of crops or require special conservation practices. Thus, they affect one (1) or more good farming practices.







3.1.3 Drainage Characteristics

The Study Area Corridor is situated within the jurisdictions of two (2) conservation authorities. The Toronto and Region Conservation Authority's (TRCA) jurisdiction extends from the southern limits of the Study Area Corridor from Major Mackenzie Drive to approximately 1.5 km north of Bloomington Road, while the Lake Simcoe Region Conservation Authority's (LSRCA) jurisdiction extends from north of Bloomington Road to beyond Aurora Road. Within the TRCA's jurisdiction, the Study Area Corridor falls within two (2) watersheds known as the Don River Watershed and the Rouge River Watershed. Moreover, within the LSRCA's jurisdiction, the Study Area Corridor north of Bloomington Road is situated within the Holland River watershed, specifically within the East Holland River subwatershed. Details regarding these watersheds are outlined below.

Don River Watershed

The Don River watershed drains an area of approximately 360 km² and includes principal watercourses known as the West Don River and the East Don River (or Little Don River) (Fenco MacLaren, 1993). The Don River watershed has been subject to intense pressures from human settlement and as of 2003, was approximately 86% urbanized and home to more than 800,000 people (TRCA, 2003). Review of the 2005 TRCA jurisdictional mapping indicates that the Don River watershed is situated within the southern limits of the Study Area Corridor. Drainage within this section of the corridor generally flows in a north to south direction.

Rouge River Watershed

The Rouge River watershed has two (2) main branches known as the Main Rouge River and Little Rouge River. It drains an area of approximately 336 km² and flows in a north to south direction into Lake Ontario. The Rouge River watershed is one of the six (6) Toronto area watersheds that have been classified by the International Joint Commission, including Canada and the United States, as an Area of Concern on the Great Lakes requiring remedial action to restore its environmental quality (TRCA, 2007).

Review of the Rouge River Watershed Plan (2007) indicates that approximately 40% of the watershed area is used for agricultural related purposes while 35% is used for urban settlements. Natural cover accounts for approximately 24% of the watershed area, while 1% is comprised of watercourses and water bodies (TRCA, 2007). Review of the 2005 TRCA jurisdictional mapping indicates that the Rouge River watershed southern boundary is situated north of Major Mackenzie Drive between Bayview Avenue and Yonge Street up to north of Bloomington Road within the Study Area Corridor. Thus, the sites considered for the Stouffville Road GO station, Bethesda Sideroad layover facility, Bloomington Road GO station and Bloomington Road layover facility are all within this watershed.

Holland River Watershed

The Holland River watershed is situated within the southwest corner of the Lake Simcoe watershed and is comprised of two (2) major tributaries known as the East Holland and the Holland/Schomberg Rivers (LSRCA, 2000). The East Holland River subwatershed is located within the Study Area Corridor and drains an area of approximately 243 km² and is situated almost entirely within the Regional Municipality of York. Similar to many of the rivers within the Holland River watershed, the East Holland River drains into Lake Simcoe, with its headwaters originating from the Oak Ridges Moraine. Further review of the 2000 LSRCA Subwatershed Report indicates that the East Holland River subwatershed is situated within the sites considered for the Vandorf GO station as well as the Aurora Road GO station and layover facility.

Review of information received from the conservation authorities coupled with information received from York Region identifies a total of 19 watercourses that traverse the CN Bala Subdivision within the Study Area Corridor. Some of these watercourses are unnamed tributaries while others may be intermittent watercourses. Of the 19 permanent/intermittent watercourses, two (2) are situated within the Don River watershed, 13 are situated within the Rouge River watershed and four (4) are situated within the Holland River watershed.

German Mills Creek, a permanent watercourse within the Don River Watershed, crosses the Study Area Corridor at two (2) locations of the CNR line. The creek crosses the rail line immediately north of Centre Street East and again approximately 400 m south of the watershed divides. In addition to the several unnamed watercourses that traverse the Study Area Corridor, four (4) main tributaries to their headwaters are located within the Rouge River watershed, namely the Upper Rouge River, Leslie Street Tributary, Berczy Creek and Bruce Creek (Geomatics International Inc., 1999). The Upper Rouge River traverses the CNR line approximately 290 m south of 19th Avenue, while the Leslie Street Tributary traverses the rail line approximately 400 m south of Stouffville Road. Moreover, several tributaries of Berczy Creek traverse the area from north of Stouffville Road to Bethesda Sideroad as well as the rail line on the north side of Bethesda Sideroad. Bruce Creek traverses the rail line approximately 900 m south of Bloomington Road. There are four (4) additional crossings within the Holland River watershed, in the East Holland River subwatershed. Two (2) of these crossings are known as the East Holland River while the other two (2) crossings north of Slaters Road are referred to as Weslie Creek.

3.1.4 Fisheries and Aquatic Ecosystems

Given the Study Area Corridor's environmental characteristics and traversing watercourses, there is a high likelihood of fisheries and fish habitat. It is noted that portions of the three (3) above mentioned watersheds support resident and migratory warmwater and coldwater fish species. The aquatic system within the Rouge River watershed is considered one of the healthiest systems in comparison to others within the GTA as it continues to support a high quality of diverse habitats and associated native species (TRCA, 2007). It is further noted that fisheries surveys conducted from 2001 to 2005 recorded at least 167 benthic invertebrates and 54 species of fish, including seven (7) introduced species.

Additionally, the Rouge River watershed is known to support two (2) coldwater species including the brook trout (*Salvelinus fontinalis*) and the redbside dace (*Clinostomus elongatus*). The redbside dace in particular is considered by the Ministry of Natural Resources (MNR) as a threatened species. The presence of these species within the greater watershed indicates that there may be suitable fish habitat conditions for the same species within the Study Area Corridor. Watercourses supporting these two (2) species are considered sensitive (Fenco MacLaren, 1993).

Fisheries and fish habitat within the East Holland River subwatershed originate on the Oak Ridges Moraine where cold groundwater discharges into the channels of the river. However, the East Holland River is comprised of both cold water and warm water fish species and also supports at least one (1) rare species: the Redside Dace (LSRCA, 2000). In order to determine the effects on fisheries and fish habitat, background information was compiled from the MNR, as well as the TRCA and LSRCA for each GO station and layover site north of Stouffville Road. A detailed investigation of each site is provided below.

Stouffville Road – GO station site

As illustrated in **Figure 4**, the Stouffville Road GO station site would be designed to avoid the watercourse feature that is situated on the east side of the CNR line. It is noted that this watercourse feature flows in a south-easterly direction from its source on the Oak Ridges Moraine, north of the site. The watercourse, known as a tributary to Berczy Creek, flows to the main branch of the Rouge River near Highway 7 and Kennedy Road in Markham, while drawing in flows from Carlton Creek and Bruce Creek.

The Stouffville Road GO station site is situated within Fisheries Management Zone 2 as per the 2007 Rouge River Watershed Plan. By definition, this zone has relatively homogeneous hydrogeological characteristics and ecological functions, which supports a characteristic fish community (TRCA, 2007). Additionally, the Management Plan has identified several target species within this zone, which are species that are most sensitive to change. Thus, proper management of the species in this zone will ensure the health of the rest of the aquatic community. These species include redbside dace, American brook lamprey (*Lampetra lamottei*), rainbow darter (*Etheostoma caeruleum*) and brassy minnow (*Hybognathus hankinsoni*) (TRCA, 2007).

Field reconnaissance activities conducted by AECOM in June, 2007 identified a large 57 inch Corrugated Steel Pipe (CSP) traversing the commercial access north of Stouffville Road in an east west direction. Some water was present at the base of the culvert on the east side of the private road, while the west side was heavily vegetated.

Review of the 1998 Fisheries Inventory and Assessment Report conducted by EcoTec Environmental Consultants Inc. along Highway 404 indicates that the tributary crossing is a permanent watercourse feature, which originates northwest of Highway 404 and crosses under the highway through a 6 m x 2 m box culvert and then drains into the southwest (EcoTec, 1998). It is further noted within the report that the width and depth of this watercourse was approximately 0.5 m and 0.2 m respectively. Additionally, emergent vegetation was the primary instream habitat feature; however some dogwood and Manitoba maple provided some overhead shade cover (EcoTec, 1998).

During field reconnaissance activities conducted by EcoTec in 1998, no fish species were captured within this permanent watercourse. However, the presence of blacknose dace (*Rhinichthys atratulus*) was documented in the area on September 21, 1998 by the TRCA. This information is consistent with the fisheries data received from the TRCA, which identifies this river as a cool water thermal regime. In addition to this fish species, historical data indicates that this watercourse once supported other fish species including brook stickleback (*Culaea inconstans*), common shiner (*Notropis cornutus*), creek chub (*Semotilus atromaculatus*), fathead minnow (*Pimephales promelas*), goldfish (*Carassius auratus*) and northern redbelly dace (*Chrosomus eos*) (TRCA, 2008).

In 2007, a natural environmental baseline assessment was completed for the Rouge River Headwater Wetland Complex located immediately adjacent to the Stouffville Road GO station site. This tributary to Berczy Creek was characterized as a managed natural watercourse that is intermittent in nature upstream of Stouffville Road. Due to several in-stream barriers including log jams, perched culverts, excessive growth and weirs, this watercourse feature appears as a swale and is considered to be of low fisheries sensitivity (Dillon Consulting, 2007).

Of particular note are the dual CSP culverts located approximately 20 m upstream of Stouffville Road. During the July 13, 2007 site reconnaissance activities conducted by Dillon Consulting, these perched culverts were clogged and contained pooled water, which was anticipated to be from a recent storm activity. The pooled water was approximately 10 to 20 cm deep and 1.5 to 2 m in wetted width. Given this barrier coupled with the lack of water

north of Stouffville Road, no fish species were captured during field reconnaissance activities (Dillon Consulting, 2007).

AECOM retained the services of EcoTec to conduct a fisheries and aquatic habitat assessment. During the April 1 and 2 2009 site reconnaissance activities, a tributary to Berczy Creek was identified along the east side of the existing golf driving range before crossing under Stouffville Road. It is noted that this tributary flows through four (4) culverts north of Stouffville Road before flowing under Stouffville Road through a concrete box culvert (EcoTec, 2009)

A small channel with very little water was observed north of the existing Rouge River Headwater Wetland Complex which was approximately 0.5 m in width and had a mean depth of approximately 15 cm. The channel widened to approximately 1.5 m and had a mean depth of approximately 30 cm as it flowed south towards Stouffville Road. One (1) coolwater baitfish species, creek chub, was caught at the culvert outlet, approximately 250 m upstream of Stouffville Road. Two (2) fish were caught along the bank under overhanging grasses at the culvert outlet (EcoTec, 2009).

Based on the flows observed during the field surveys, it is assumed that this watercourse is intermittent upstream of Stouffville Road and is dry during the summer months. Further details of the April, 2009 field surveys are documented in the **Natural Resource Assessment** report within **Appendix C** of this report.

Bethesda Sideroad – Layover site

As illustrated in **Figure 4**, the Bethesda Sideroad layover facility would be designed to avoid Berczy Creek, to the extent possible. This watercourse feature originates from the west side of Highway 404 and crosses the highway through a 2.5 m box culvert. During field reconnaissance activities conducted by AECOM in June, 2007, standing water was present within Berczy Creek at Bethesda Sideroad. Based on aerial interpretation coupled with other field investigations as per review of the MNR field collection records, this watercourse appears to connect with Haynes Lake, which is located approximately 700 m on the west side of Leslie Street, north of Bethesda Sideroad.

The Bethesda Sideroad layover facility is situated within Fisheries Management Zone 2 as per the 2007 Rouge River Watershed Plan. By definition, this zone has relatively homogeneous hydrogeological characteristics and ecological functions, which supports a characteristic fish community (TRCA, 2007). Additionally, the Management Plan has identified several target species within this zone, which are species that are most sensitive to change. Thus, proper management of the species in this zone will ensure the health of the rest of the aquatic community. These species include redbside dace, American brook lamprey, rainbow darter and brassy minnow (TRCA, 2007).

In addition to the above, a tributary to Berczy Creek (herein referred to as watercourse B) is present within the Study Area Corridor located south of the above mentioned watercourse on the west side of Highway 404. However, these two (2) watercourses connect to each other on the east side of Highway 404 beyond the limits of study. Review of the 1998 Fisheries Inventory and Assessment Report conducted by EcoTec identifies watercourse B as a low gradient, intermittent tributary comprised of a tall grass/cattail swale on either side of Highway 404 (EcoTec, 1998). It is noted that watercourse B crosses under Highway 404 via a 4 m x 2 m concrete box culvert and at the time of the survey, was comprised of a mean width and depth channel of 3 m and 0.3 m respectively (EcoTec, 1998).

Information received from the MNR indicates that field reconnaissance activities conducted in 1994 did not indicate the presence of fish habitat within the cool water thermal regime watercourse B. In addition, no fish species were recorded in the 1998 Fisheries Inventory and Assessment conducted by EcoTec. Moreover, it was noted that the substrate of this tributary was comprised primarily of muck and that during the June, 1998 survey, the channel contained high amounts of filamentous algae growth, which could have potentially been attributed to nutrient inputs as a result of adjacent agricultural lands (EcoTec, 1998). Furthermore, no fish species were captured at either watercourses during the 1993 GO EA Study (Fenco MacLaren, 1993).

According to a July, 2005 fisheries investigation conducted by Dillon Consulting Limited on Haynes Lake and Berczy Creek, several fish species were captured. Such species include brook stickleback, central mudminnow (*Umbra limi*), common shiner and a juvenile brown bullhead (*Ameiurus nebulosus*) (Dillon Consulting, 2005). Additional historical data received from the TRCA indicates the presence of fish habitat, namely brown bullhead, largemouth bass (*Micropterus salmoides*), northern pike (*Esox lucius*), pumpkinseed (*Lepomis gibbosus*), white sucker (*Catostomus commersonii*) and yellow perch (*Perca flavescens*). However, this cool water thermal regime (Berczy Creek) flows through culverts under a private access road, as well as under Bethesda Sideroad.

During site reconnaissance activities conducted by EcoTec on April 1 and 2, 2009, Berczy Creek traveled through a wetland area north of Bethesda Sideroad via a perched culvert, which is noted to create a barrier to fish migration upstream of the road. Downstream of Bethesda Sideroad, the creek flowed through a defined channel for approximately 20 m before developing into a braided channel within the Wilcox – St. George Wetland Complex. The channel had a width of approximately 1 m and a mean depth of 35 cm. Within this wetland complex immediately south of Bethesda Sideroad, five (5) baitfish species were captured including creek chub, fathead minnow, northern redbelly dace, central mudminnow and brook stickleback (EcoTec, 2009).

The constructed gravel access road south of the wetland complex and channel was conveyed under the roadway via a concrete culvert, which at the time of the surveys appeared to be perched, creating a small waterfall. South of the access road, a concrete storm sewer structure had been placed at the culvert outlet creating a perch and barrier to fish migration (EcoTec, 2009). The channel becomes moderately defined south of the access road with some braided channeling. The width of the defined channel ranged from 0.5 m to 1.5 m with a mean depth of approximately 0.25 m.

Watercourse B within the project limits originated west of the CNR line and flowed south-east into a constructed storm water management pond, approximately 350 m south of Bethesda Sideroad within the southern limits of the Dufferin Aggregates Main Yard. A flooded ditchline was noted on the west side of the CNR line, which extended approximately 100 m and flooded many trees and shrubs along the banks. The flooded ditchline had an approximately 3 m width and a mean depth of 50 cm (EcoTec, 2009).

Within the proposed layover footprint on the east side of the CNR line, no defined channel or culvert was observed. Given the amount of standing water on the west side of the tracks, it is assumed that no culvert is present or it is no longer functioning. The fields on the east side of the CNR line were saturated with water and it appeared that water was seeping through the ground from the flooded ditchline on the west side of the CNR line. Fish sampling only occurred within the flooded ditchline on the west side of the CNR line as not enough water was present downstream of the CNR line within the layover footprint. During the site reconnaissance activities, no fish were captured within this intermittent watercourse. It is noted that watercourse B was characterized as having weak potential to support fish communities. Further details of the April, 2009 field surveys are documented within **Appendix C** of this report.

Bloomington Road – GO station site

The permanent Bruce Creek cold water thermal regime is mapped approximately 820 m south of the Bloomington Road/CNR line crossing. This watercourse crosses the highway through an approximately 1.5 m box culvert. In addition, field reconnaissance activities conducted by AECOM suggests the presence of a drainage swale that travels south of Bloomington Road into an adjacent wetland known as the White-Rose Preston Lake Wetland Complex, approximately 230 m south of Bloomington Road on the east side of the CNR line.

The Bloomington Road GO station site is situated within Fisheries Management Zone 3 as per the 2007 Rouge River Watershed Plan. By definition, this zone has relatively homogeneous hydrogeological characteristics and ecological functions, which supports a characteristic fish community (TRCA, 2007). Additionally, the Management Plan has identified several target species within this zone, which are species that are most sensitive to change. Thus, proper management of the species in this zone will ensure the health of the rest of the aquatic community. These species include redbelly dace, American brook lamprey (*Lampetra lamottei*), rainbow darter (*Etheostoma caeruleum*) brook trout and mottled sculpin (*Cottus bairdi*) (TRCA, 2007).

Review of the 1993 GO Transit EA study notes that there are no watercourse features within the original Bloomington Road GO station footprint. However, given the area's adjacency to Bruce Creek, the Bloomington Wetlands, the White-Rose Preston Lake Wetland Complex and the Simeon Lake Forest Complex, the potential for fish habitat exists (EcoTec, 1998). In addition, the Bloomington Wetland is considered a spawning and rearing habitat for brook trout (Geomatics International Inc., 1999).

During the April 1 and 2, 2009 site reconnaissance activities conducted by EcoTec, it was noted that an intermittent drainage swale was located south of Bloomington Road on the east side of the CNR line. This drainage swale traverses Bloomington Road via a CSP culvert, which at the time of the surveys appeared to be dry. The drainage swale on the south side of Bloomington Road consisting primarily of cattails extended south between two (2) large embankments for approximately 230 m, which then drained into the White Rose – Preston Lake Wetland Complex (EcoTec, 2009).

The drainage swale, which was comprised of a wetted width of approximately 3 m and a mean depth of 0.70 m near the wetland, was generally comprised of standing water. There was much less water adjacent to the CSP immediately south of Bloomington Road with an overall mean depth of approximately 0.2 m. Although no fish species were captured within this drainage swale, the potential for fish habitat exists.

The littoral area of the White Rose – Preston Lake Wetland Complex was also surveyed and found to contain one (1) fish species of warmwater baitfish, known as the northern redbelly dace. As the depth of the wetland exceeded 1 m, only the littoral area was sampled (EcoTec, 2009).

A second smaller environmentally significant wetland complex adjacent to the proposed bus loop of the Bloomington Road GO station was also sampled for the presence of fish habitat. It was assumed that this wetland serves as drainage from Highway 404 and is not likely fish bearing. To this end, no fish species were captured during EcoTec's site reconnaissance activities. Further details of the April, 2009 field surveys are documented within **Appendix C** of this report.

Bloomington Road – Layover site

The Bloomington Road layover site is situated on the north side of Bloomington Road and on the east side of the CNR line as illustrated in **Figure 5**. Similar to the Bloomington Road GO station site, the layover facility is also situated within Fisheries Management Zone 3 and is within the general vicinity of Bruce Creek (see description for Bloomington Road GO station site). Although there are no watercourse features within this site, field reconnaissance activities have confirmed that this site is wet/swampy most likely due to the presence of adjacent wetland features. It is noted that the adjacent Bloomington Wetland is considered a spawning and rearing habitat for brook trout (Geomatix International Inc., 1999).

Vandorf Sideroad – GO station site

Figure 6 illustrates that the access road to the Vandorf Sideroad GO station site will displace approximately 30 m of the East Holland River. The river appears to travel from the east side of Highway 404 beyond the Study Area Corridor in an eastward direction under Woodbine Avenue and the rail line. The East Holland River continues east through a White-Rose Preston Lake Wetland Complex, and then drains through a CSP under Vandorf Sideroad and a private entrance into the Van Nostrand Lake.

Review of the 2000 East Holland River Subwatershed Study identifies that this watercourse feature is designated as a cold water thermal regime. Review of Figure 7.15 – Aquatic Issues by Catchment within the Study identifies that the Study Area Corridor is situated within Catchment 1, which illustrates several aquatic issues including streambank, alteration and hardening, drains pipes and stormwater outlets, lack of stream cover (<75%), streambank erosion, ponds draining into local rivers and water taking (LSRCA, 2000).

Information received from the LSRCA for 2007 confirms that this watercourse is fish bearing and supports several fish species including brook trout, blacknose dace, longnose dace (*Rhinichthys cataractae*), creek chub, brook stickleback, slimy sculpin (*Cottus cognatus*), white sucker, fathead minnow, rainbow darter, mottled sculpin and Iowa darter (*Etheostoma exile*) (LSRCA, 2008). Moreover in 2002, LGL Limited sampled the site adjacent to Woodbine Avenue and downstream for approximately 100 m and captured mottled sculpin, blacknose dace, white sucker, creek chub, Iowa darter, common shiner and pumpkinseed (LGL, 2002).

Aurora Road – Layover site

As illustrated in **Figure 7**, the Aurora Road layover site will displace approximately 50 m of the Weslie Creek branch, which flows through the Bogart Creek Wetland Complex and under the CNR line, where it eventually flows to Aurora Road and connects with a second branch to Weslie Creek north of Aurora Road. The Aurora Road layover site is situated within Catchment 1 of the 2000 East Holland River Subwatershed Study, with several aquatic issues as described above for the Vandorf Sideroad GO station site.

Information received from the LSRCA identifies this watercourse as a cold water thermal regime. Fish sampling conducted in 2003 at the Woodbine Avenue/Weslie Creek crossing, north of Aurora Road indicates the presence of several fish species including White sucker, Creek chub, Brook stickleback and Pumpkinseed (LSRCA, 2008).

Aurora Road – GO station site

The Aurora Road GO station site is situated immediately south of Aurora Road on the east side of the CNR line. The access road to the GO station will displace approximately 10 m of a watercourse mapped as Weslie Creek. This watercourse connects to a broader network of the East Holland River, north of the Study Area Corridor.

This site is situated within the 2000 East Holland River Subwatershed Study, with several aquatic issues. As this watercourse connects to the watercourse in the Aurora Road layover facility site, both sites may have similar fish species. Thus, potential fish species present within this site are discussed above under the Aurora Road layover facility site.

3.1.5 Vegetation and Vegetation Communities

The Rouge River watershed is situated at the transition between the Carolinian forest zone and the Great Lakes-St. Lawrence mixed forest zone (TRCA, 2007). The entire Study Area Corridor is situated within the Mixed Wood Plain Ecozone and is situated within two (2) Ecoregions. The Lake Erie Lowland Ecoregion is mapped within the corridor from the southern limits north to approximately 1.3 km south of Bloomington Road. Moreover, the Manitoulin Lake Simcoe Ecoregion is mapped south of Bloomington Road to beyond the northern limits of the Study Area Corridor.

Figure 4. Existing Environmental Conditions – Stouffville Road and Bethesda Sideroad

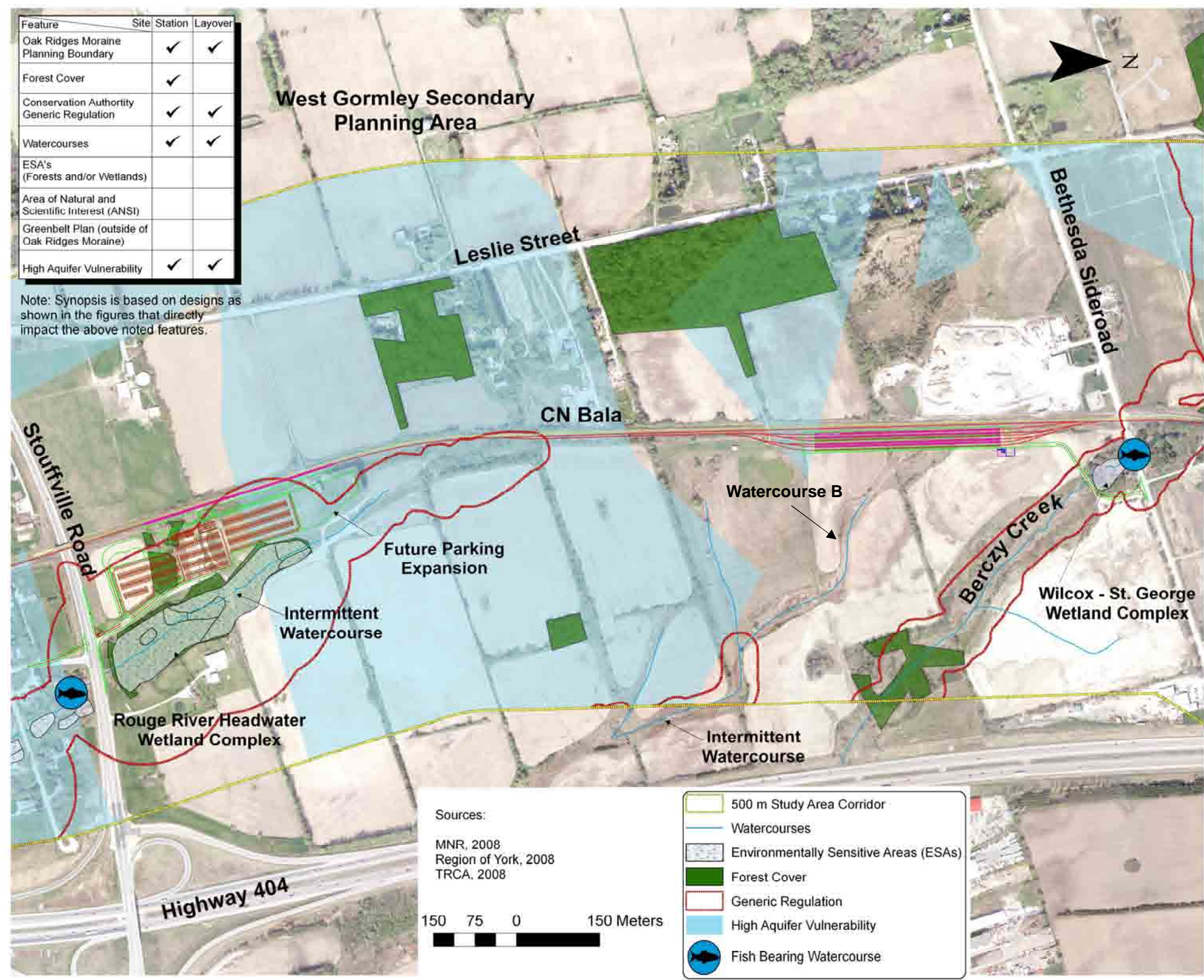


Figure 5. Existing Environmental Conditions – Bloomington Road

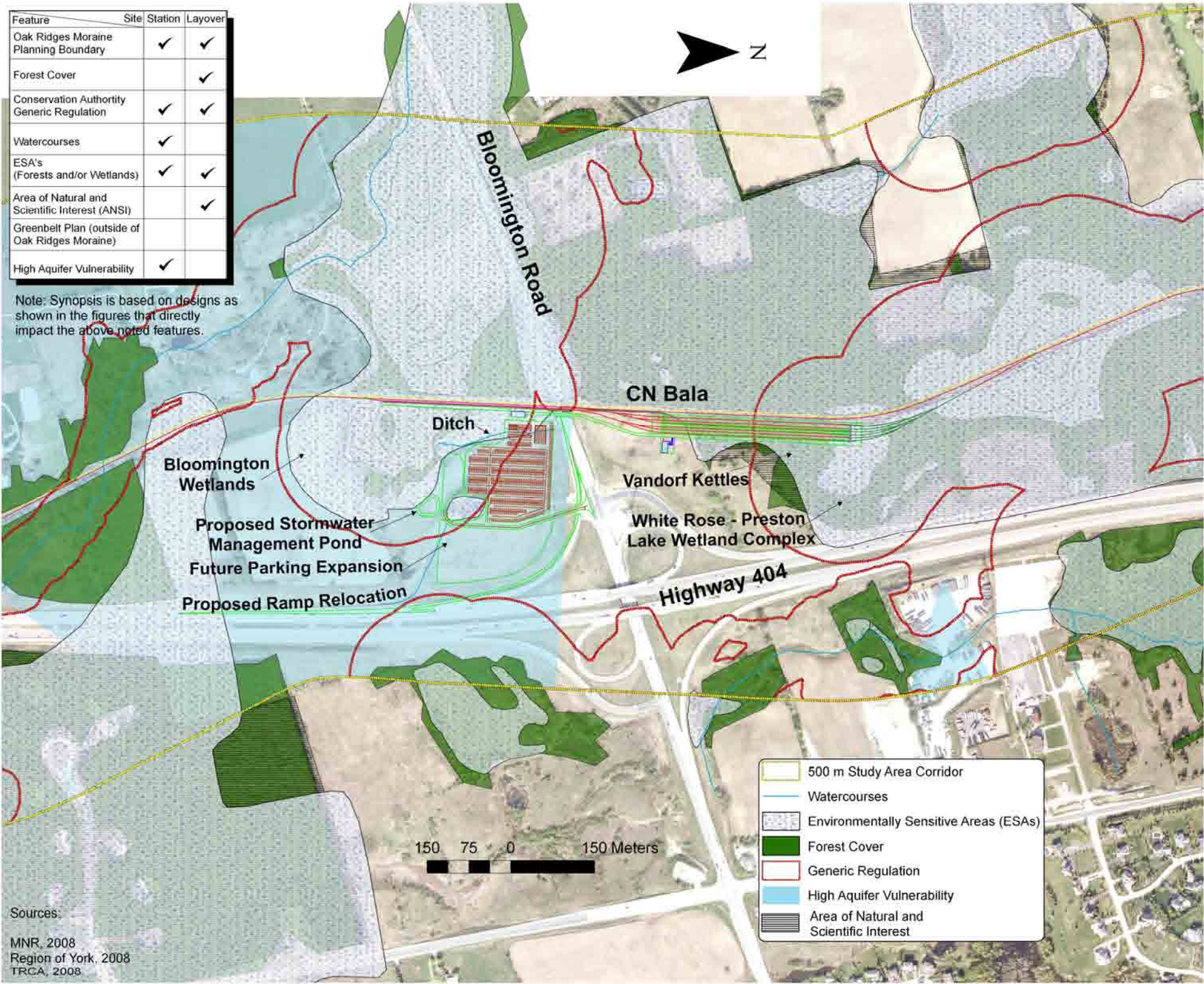


Figure 6. Existing Environmental Conditions – Vandorf Sideroad

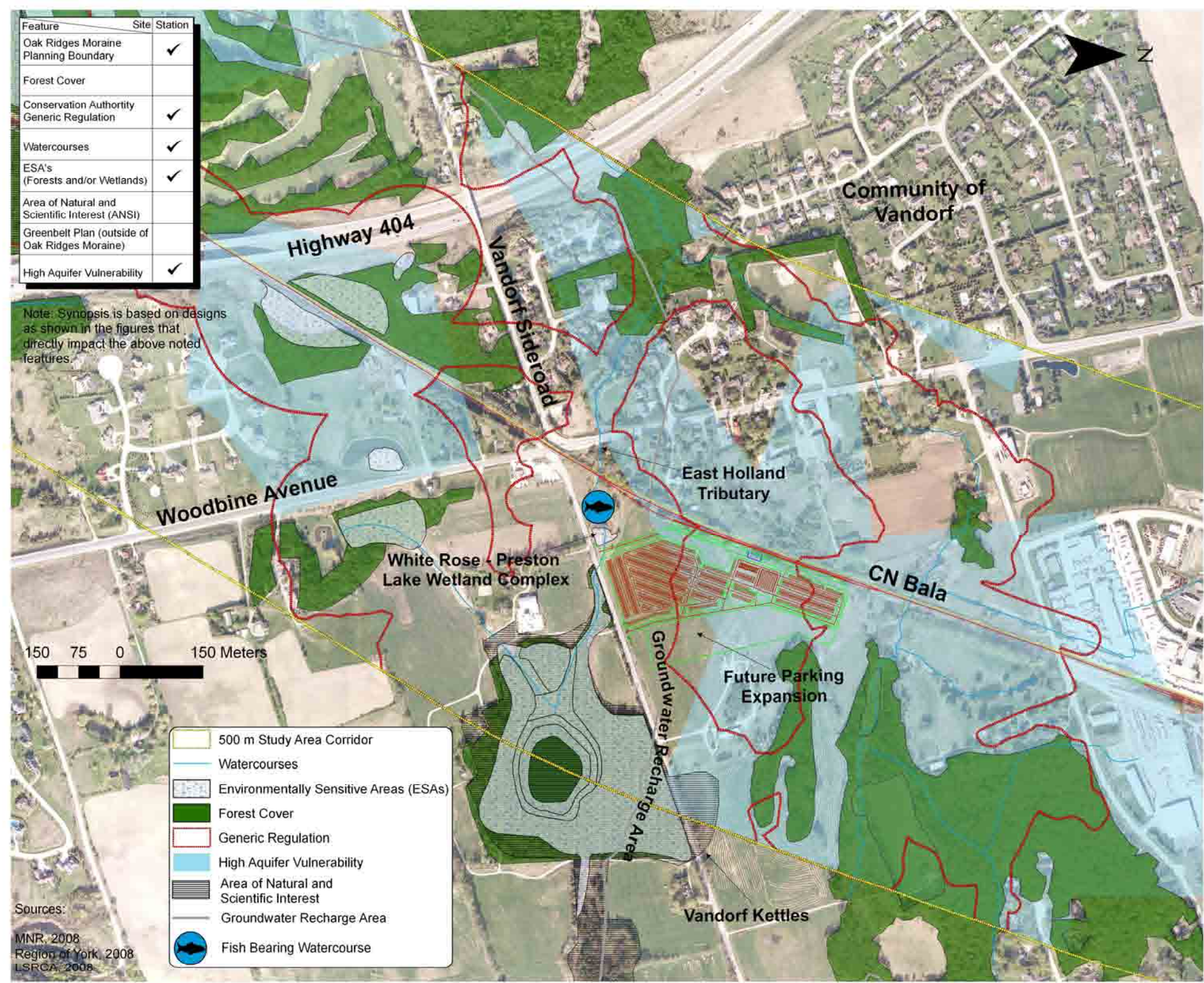
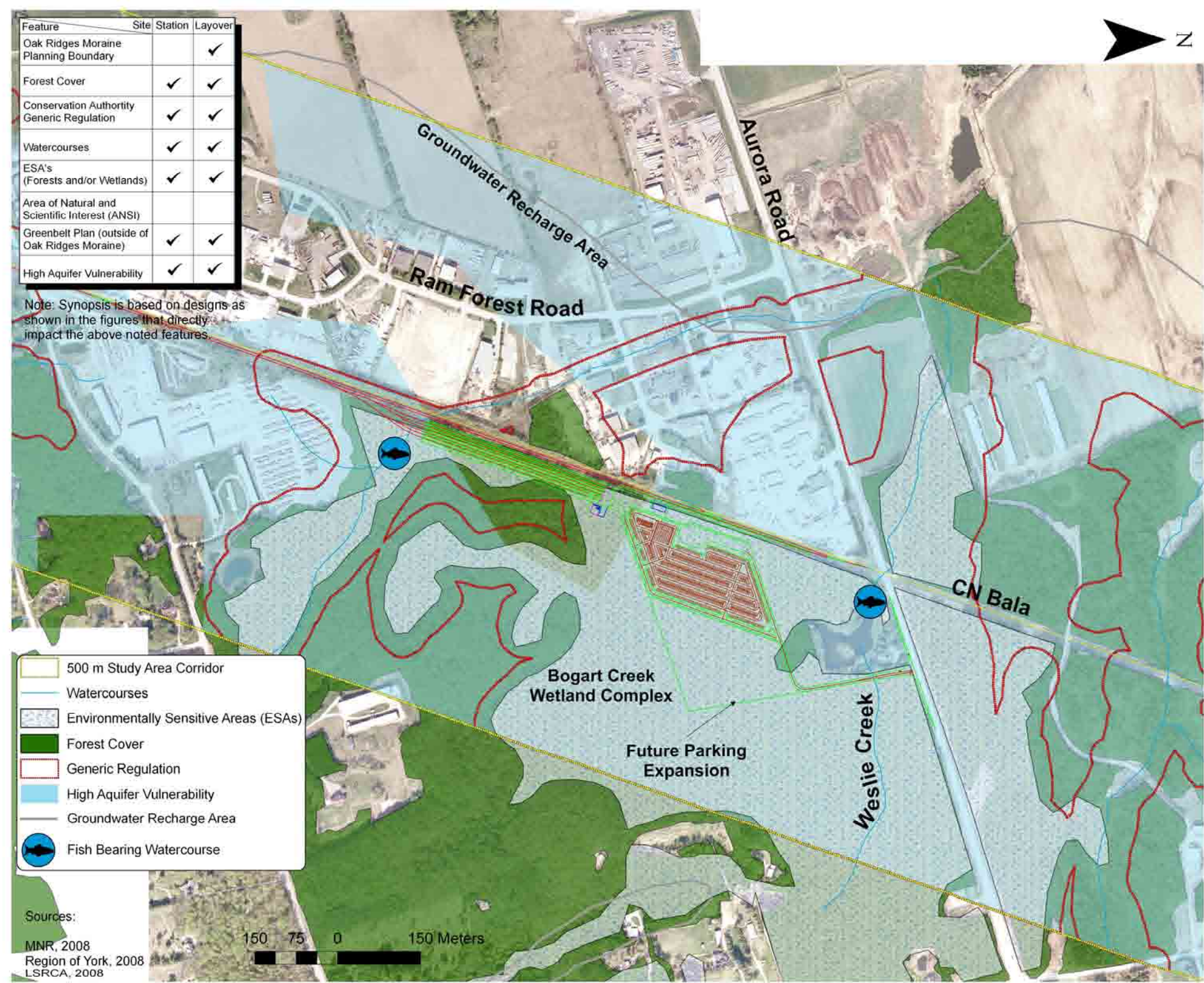


Figure 7. Existing Environmental Conditions – Aurora Road



The main vegetation communities within the Study Area Corridor are mapped as old field, lowland forest, upland forest, and shrubland. Old field vegetation can be found on previously disturbed areas with herbaceous plants and various grass species, asters and goldenrods. Lowland forests are normally found in areas that are relatively low and poorly drained, whereas upland forests are typically found in relatively elevated and well drained areas. Species that are common to the upland forests include mature beech (*Fagus sylvatica*) and sugar maple (*Acer saccharum*). Shrublands are characterized by areas covered by shrubs and small trees, such as the hawthorn (*Crataegus*), common buckthorn (*Rhamnus cathartica*), and small trembling aspen (*Populus tremuloides*) (Fenco MacLaren, 1993).

Much of the lands south of the Oak Ridges Moraine boundary within the Study Area Corridor (approximately 1 km south of 19th Avenue along the CNR line) have been previously disturbed by progressive urban development within the Town of Richmond Hill. Consequently, vegetative species within this portion of the Study Area Corridor immediately adjacent to the rail line consists primarily of herbaceous plants and various grass species.

Those lands located south of 19th Avenue within the Study Area Corridor and the southern limits of the Oak Ridges Moraine are comprised of lowland forest. The Oak Ridges Moraine provides ideal conditions for vegetative development within the Town of Richmond Hill (Geomatics International Inc., 1999). Moreover, information received from the TRCA identifies that the area on the west side of the rail line, referred to as Newberry Park, is comprised of a Native Deciduous Cultural Woodland and a White Cedar Organic Coniferous Swamp with species including tamarack (*Larix laricina*), goldthread (*Coptis trifolia*) and star-flower (*Trientalis borealis*) (TRCA, 2008).

The lowland forest on the west side of the rail line immediately south of 19th Avenue is comprised of fresh-moist ash lowland deciduous forest and includes species such as the leafy pondweed (*Potamogeton foliosus*). Given the area's proximity to the watercourse feature, there is also evidence of a willow mineral deciduous swamp. On the east side of the CNR line, there is a white cedar organic coniferous swamp and a yellow birch mineral deciduous swamp, which includes flora species such as black ash (*Fraxinus nigra*), fringed sedge (*Carex crinita*), red trillium (*Trillium erectum*), oak fern (*Gymnocarpium dryopteris*), cinnamon fern (*Osmunda cinnamomea*), goldthread, marsh pennywort (*Hydrocotyle Americana*), rose twisted-stalk (*Streptopus roseus*), star-flower, and crested wood fern (*Dryopteris cristata*), among others beyond the Study Area Corridor (TRCA, 2008).

Immediately north of 19th Avenue, on the east side of the CNR line, is a significant upland forest known as the Jefferson Forest. The Jefferson Forest is a wet forest located on the west side of the rail line between Stouffville Road and 19th Avenue. The forest includes tree species such as white cedar, hemlock, white birch, yellow birch, black ash and tamarack. Speckled alder, mountain maple, ferns, and habitat for orchids can also be found in this forest. Historical records indicate that nationally and regionally rare plant species have been found in the Jefferson Forest (MNR, 2009).

The Jefferson Forest (East Section) covers an area of 57 hectares (ha) on the east side of the rail line between Stouffville Road and 19th Avenue (MNR, 2009). This area is characterized by rich, mature maple-oak-black cherry forest communities and consists of the Jefferson Wetland/Swamp. The Jefferson Wetland/Swamp is comprised primarily of coniferous, mixed and deciduous swamps, including some areas of meadow marsh and shrub thicket swamp. The vegetation composition for each is as follows:

Coniferous swamp – Sections of coniferous swamp are located along the north, east and south periphery of the Jefferson Wetland and consists of white cedar (*Thuja occidentalis*), hemlock (*Tsuga*

canadensis), tamarack (*Larix laricina*), yellow (*Betula alleghaniensis*), white birch (*B. papyrifera*), mountain maple (*Acer spicatum*), dwarf raspberry (*Rubus pubescens*), trout lily (*Erythronium americanum*), broad leaved toothwort (*Cardamine dyphilla*), Virginia waterleaf (*Hydrophyllum virginianum*), trillium (*Trillium spp.*), spotted jewelweed (*Impatiens capensis*), sensitive fern (*Onoclea sensibilis*), and rough sedge (*Carex scabrata*).

Mixed swamp – The mixed swamp is the predominant vegetation community within the Jefferson Wetland and includes the above mentioned coniferous trees, white elm (*Ulmus americana*); yellow birch, white birch, green ash (*Fraxinus pensylvanica*), black ash (*Fraxinus nigra*), balsam poplar (*Populus balsamifera*), trembling aspen (*Populus tremuloides*), white birch, yellow birch, white elm, black ash, green ash, balsam poplar, Manitoba maple (*Acer negundo*), trout lily, broad-leaved, toothwort, Virginia waterleaf, trillium, spotted jewelweed, and sensitive fern.

Deciduous swamp – Patches of the deciduous swamp are interspersed throughout the Jefferson Wetland and consists of yellow birch, white birch, trembling aspen, red maple (*Acer rubrum*), black ash, white elm, green Ash, and Manitoba maple.

Meadow marsh – The small section of shrub thicket swamp, located in the southeast portion of the Jefferson Swamp, appears to have been cleared in the past. It consists of red-osier dogwood thicket, white cedar, tall goldenrod (*Solidago altissima*), and Canada blue grass (*Poa compressa*).

About 0.5 ha of graminoid fen is mapped in the centre of the swamp, as per the Ontario Wetland Evaluation System (MNR, 2009). The fen is composed of swamp horsetail (*Equisetum fluviatile*), Porcupine sedge (*Carex hystericina*), red-sheathed bull rush (*Scirpus microcarpus*), some bog goldenrod (*Solidago uliginosa*), and three-leaved Solomon's seal (*Maianthemum trifolium*) (GO, 1993; Geomatics, 1999).

As noted above, the Study Area Corridor passes through the sensitive Oak Ridges Moraine. The moraine generally contains a variety of plant species, such as balsam fir and speckled alder. Much of the remaining vegetation within the Study Area Corridor is typical of the type of vegetation normally found in disturbed areas. Residential type vegetation and streetside plantings are present at the junction of the rail line and Stouffville Road.

Stouffville Road – GO station site

The Stouffville Road GO station site is characterized by lowland forest and old field vegetation, which has formed within and adjacent to the watercourse depression. A small lowland forest patch is situated within the site and is approximately 3,000 m² in size. In addition, there are two (2) smaller lowland forest types within the site, which account for approximately 1,000 m². Field reconnaissance activities conducted by AECOM have confirmed that a portion of the site is currently being used for cash crop agriculture production, namely corn fields, which accounts for approximately 12,000 m². Further north of the lowland forest cover, the site is situated on disturbed manicured grassland.

Review of the 1993 GO EA study identifies willow shrubs, white elm, pin cherry as well as some hedgerow within the area. In addition, sugar maple, basswood, apple, black cherry (*Prunus serotina*), European mountain ash (*Sorbus aucuparia*), white ash and herbaceous vegetation was also present within the site (Fenco MacLaren, 1993).

During a June 20 and September 21, 2007 botanical survey of the Rouge River Headwaters Wetland Complex, immediately adjacent to the Stouffville Road site, a total of 132 species of flora were identified, with 34% listed as exotic of non-native species (Dillon Consulting, 2007). A number of garden species including goutweed (*Aegopodium podagraria*) and Chinese lantern (*Physalis alkekengi*) were found growing spontaneously and prolifically along the eastern portion of the woodlot.

It is further noted that although no nationally or provincially rare species were observed within the woodlot, 10 species of regional concern were noted, including smooth-sheathed sedge (*Carex laevivaginata*), water horsetail (*Equisetum fluviatile*), rough avens (*Geum laciniatum*), common oak fern (*Gymnocarpium dryopteris*), royal fern (*Osmunda regalis*), northern beech fern (*Thelypteris phegopteris*), swamp red current (*Ribes triste*), great water dock (*Rumex orbiculatus*), starflower (*Trientalis borealis ssp. borealis*) and maple-leaved viburnum (*Viburnum acerifolium*) (Dillon Consulting, 2007).

As part of this Study, AECOM retained the services of EcoTec to document the existing vegetative communities within the Stouffville Road GO station site. As field investigations were conducted on April 1 and 2, 2009, an extensive inventory of herbaceous vegetation was not possible. However, the following vegetative communities were noted within this site:

Community: Moist Lowland Deciduous Forest

This vegetative community was situated in between the existing corn field and the gravel parking area for the recreational establishment. Such species consisted of white elm, basswood (*Tilia americana*), poplar, American beech (*Fagus grandifolia*), and Manitoba maple (*Acer negundo*). Sections of the forest with open or patchy canopy were dominated by common buckthorn. Red-osier dogwood (*Cornus sericea*) and wild cucumber (*Echinocystis lobata*) were also present. Herbaceous vegetation included wild strawberry (*Fragaria virginiana*), Queen Anne's lace (*Daucus carota*) and garlic mustard (*Alliaria petiolata*).

Community: Mineral Meadow Marsh

This vegetative community occurred on the north side of the moist lowland deciduous forest. Herbaceous species comprised of meadow marsh appeared to be primarily grasses (Poaceae) but could not be identified due to the timing of the survey.

Community: Non-Forested Riparian

Situated on the east side of the golf driving range, this community consisted of grasses and other herbaceous species, which could not be identified due to the timing of the survey.

Community: Agricultural Field

This vegetative community occurred on the north side of Stouffville Road. At the time of the survey, corn husks within the area provided evidence that this site is used for corn production.

Community: Manicured Lawn

A large portion of the site was comprised of manicured lawn, which included the driving range area and putting green.

Community: Cultural Meadow

Situated adjacent to the north side of Stouffville Road and the CNR line are pockets of cultural meadow comprised of Manitoba maple, common buckthorn, red-osier dogwood, Queen Anne's lace, goldenrod (*Solidago sp.*) and common mullein (*Verbascum thapsus*). A spruce (*Picea sp.*) hedgerow also existed within the cultural meadow.

Community: Moist White Cedar Mixed Forest

This community was situated within the Rouge River Headwater Wetland Complex on the east side of the access road to the recreational establishment. Tree species within this community included white cedar, basswood, beech, poplar, and ash (*Fraxinus sp.*). A small cattail (*Typha sp.*) marsh pocket also existed within the forest.

Cleared Riparian

Cleared riparian appeared adjacent to the Berczy Creek tributary north of the Rouge River Headwater Wetland Complex. During site reconnaissance activities, some vegetative clearing was noted and new tree stumps were present adjacent to the watercourse. Remaining vegetation primarily in the form of grasses and other herbaceous species were noted, but could not be identified due to the timing of the survey (EcoTec, 2009). Further details of the April, 2009 field surveys are documented within **Appendix C** of this report.

Bethesda Sideroad – Layover site

From the above noted station to the Bethesda Sideroad layover site, lands are primarily comprised of old field/agriculture. During field reconnaissance activities conducted by AECOM of the Bethesda Sideroad layover site, vegetation types observed included cattail/grass swales as well as herbaceous species adjacent to the CNR line. Due to past disturbances of the area, much of the site is currently comprised of fill/fallow, with no active agricultural related uses. It is further noted that large Manitoba maple, Norway spruce (*Picea Abies*), sugar maple and apple trees were recorded in the area adjacent to Bethesda Sideroad (Fenco MacLaren, 1993). Such tree species are generally situated within the significant Wilcox-St. George Wetland Complex, which the site will likely avoid.

During April 1 and 2, 2009 field reconnaissance activities, EcoTec documented the existing vegetative communities within the Bethesda Sideroad layover site. Due to the timing of the investigations, an extensive inventory of herbaceous vegetation was not possible. However, the following vegetative communities were noted within this site:

Community: Mineral Shallow Marsh

This vegetative community traversed watercourse B of Berczy Creek as well as the Wilcox – St. George Wetland Complex and was characterized by cattail mineral shallow marsh. Other herbaceous species within these communities could not be identified due to the timing of the survey.

Community: Moist Lowland Deciduous Forest

Areas of moist lowland deciduous forest were situated on either side of Berczy Creek south of the access road on the south side of Bethesda Sideroad. This vegetative community was surrounded by a mineral shallow marsh community and included tree and shrub species of willows (*Salix* spp.), Manitoba maple, and red-osier dogwood. Herbaceous species present included Queen Anne's lace, common mullein, and common burdock (*Arctium minus*).

Community: Agricultural Field

Agricultural type fields were present within the area; however, it was not evident when the fields were last used for agricultural production.

Community: Disturbed Field

A large portion of the area was significantly disturbed with no apparent vegetative growth.

Community: Cultural Meadow

This vegetative community was located adjacent to the CNR line and was primarily comprised of small tree and shrub species including willows, Manitoba maple, red-osier dogwood and common buckthorn. Herbaceous species present included coltsfoot (*Tussilago farfara*), wild strawberry, common milkweed (*Asclepias syriaca*), and chicory (*Cichorium intybus*). Minimal cattail coverage existed at wet areas within the cultural meadow. Further details of the April, 2009 field surveys are documented within **Appendix C** of this report.

Bloomington Road – GO station site

The Bloomington Road GO station site is situated on old field vegetation. As noted in the **Figure 5**, the site will likely avoid several wetland features including the large cattail organic shallow marsh, which is comprised of species such as smart waterweed (*Polygonum amphibium*), while the bus loop will for the most part avoid a narrow-leaved cattail mineral shallow marsh. Moreover, this station is partially situated within the Bloomington Wetlands, which is dominated by tamarack, balsam poplar, white birch and dense clumps of understory species (Fenco MacLaren, 1993).

Review of the GO Transit 1993 EA study identifies the site as an old field system comprised of willow and cattail mosaics as well as an island of trees including white pine, white cedar, hemlock, white birch, trembling aspen and red maple within the large Cattail Organic Shallow Marsh to the south of the site. In addition, shoreline vegetation includes staghorn sumac (*Rhus typhina*), willows, white cedar, white birch and sugar maple (Fenco MacLaren, 1993).

During April 1 and 2, 2009 field reconnaissance activities, EcoTec documented the existing vegetative communities within the Bloomington Road GO station site. Due to the timing of the investigations, an extensive inventory of herbaceous vegetation was not possible. However, the following vegetative communities were noted within this site:

Community: Cultural Meadow

Cultural Meadow was the predominant vegetative community on the east side of the CNR line, south of Bloomington Road. Tree and shrub species included white ash (*Fraxinus Americana*), white elm, spruce, poplar, staghorn sumac (*Rhus typhina*), common buckthorn, grasses, Queen Anne's lace, and common mullein.

Community: Riparian Cattail Marsh

The above noted drainage ditch that is connected to the White Rose-Preston Lake Wetland Complex is surrounded by this vegetative community, which is primarily comprised of cattails and other herbaceous species that could not be identified due to the timing of the survey.

Community: Shallow Water

Two (2) pockets of shallow water were noted in the vicinity of the southwest quadrant of the Highway 404 interchange. These isolated pockets were surrounded by species including trembling aspen (*Populus tremuloides*), large-tooth aspen (*Populus grandidentata*), balsam poplar (*Populus balsamifera*), eastern cottonwood (*Populus deltoids*), willows, and white elm. Shrub species were also present and included red-osier dogwood and common buckthorn. No emergent or floating-leaved herbaceous vegetation was evident at the time of the survey.

Community: Mineral Shallow Marsh

Mineral Shallow Marsh was contained within the White Rose-Preston Lake Wetland Complex and primarily consisted of cattails. Tree species present included white cedar, willow, and white birch (*Betula papyrifera*). Staghorn sumac, garlic mustard, and longstalk sedge (*Carex pedunculata*) was present along the extent of the wetland complex. Further details of the April, 2009 field surveys are documented within **Appendix C** of this report.

Bloomington Road – Layover site

The Bloomington Road layover site is situated within old field vegetation and upload forest. Information received from the TRCA illustrates that this area is situated within several land classifications including native forb old field meadow, sumac cultural thicket, dry-fresh sugar maple - white ash deciduous forest, willow mineral thicket swamp, paper birch - poplar mineral deciduous swamp, winterberry organic thicket swamp and tamarack - leatherleaf treed kettle bog (TRCA, 2008). Within these land classifications, there are several flora species including rose twisted-stalk (*Streptopus roseus*), Indian cucumber-root (*Medeola virginiana*), fringed polygala (*Polygala paucifolia*), short-awned foxtail (*Alopecurus aequalis*), common bladderwort (*Utricularia vulgaris*), retrorse sedge (*Carex retrorsa*), blue flag (*Iris versicolor*), leather leaf (*Chamaedaphne calyculata*), black chokeberry (*Aronia melanocarpa*), water horsetail (*Equisetum fluviatile*), fringed sedge (*Carex crinita*), bog laurel

(*Kalmia polifolia*) and small pondweed (*Potamogeton pusillus*) (TRCA, 2008). There are several other flora species directly adjacent to the layover facility site.

The 1993 EA study indicates the presence of rare species at this site. Review of the MNR NHIC identifies that this site is situated within the provincially significant White Rose-Preston Lake Wetland Complex. It is noted that vegetation within this wetland complex includes a high diversity of 77 wetland types (MNR, 2009).

In addition, information received from the Regional Municipality of York as well as the MNR identifies that the Bloomington Road layover site is within the Vandorf Kettles, which is considered a life science Area of Natural and Scientific Interest (ANSI), the White-Rose Preston Lake Wetland Complex and the White Rose Bog. It is noted that this area supports winterberry, willow, meadowsweet, cattail and scattered silver maple and trembling aspen (Fenco MacLaren, 1993). Additionally, the site is situated within the Bloomington Wetlands, which is discussed above under the Bloomington Road GO station site.

Vandorf Sideroad – GO station site

The Vandorf Sideroad GO station site is situated primarily on old field grassland vegetation. As the site is situated immediately adjacent to the White-Rose Preston Lake Wetland Complex, and north of the Van Nostrand Lake, review of the MNR NHIC website identifies the site as containing submerged communities of Flat-stemmed Pondweed, Eurasian Water Milfoil, Pale Water Milfoil, Slender Najas, Starwort, Common Coontail and Canada Waterweed as well as floating communities of Bullhead Lily, Fragrant Water-lily and Floating Pondweed. Common Duckweed is most prevalent in the smaller ponds (MNR, 2009). Field reconnaissance activities of this site have confirmed that vegetation generally consists of grasses with sporadic coniferous trees adjacent to the rail line.

Aurora Road – Layover facility and GO station sites

Review of the East Holland River Subwatershed Ecological Land Classification map identifies those lands within the sites as a mixed swamp (LSRCA website, 2009). The layover and GO Train station sites are comprised of dense lowland forest cover/swampy areas and are within the provincially significant Bogart Creek Wetland Complex.

3.1.6 Wildlife

Wildlife within the Study Area Corridor, particularly south of Stouffville Road where urban development is greater, supports a range of species that have adapted to an urban setting. This can include common avian species such as European starling, American robin and Northern cardinal (*Cardinalis cardinalis*) as well as common mammalian species such as raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), gray squirrel (*Sciurus carolinensis*) and cottontail (*Sylvilagus floridanus*).

However, as noted in **Section 3.1.5**, there are some sensitive areas including the Jefferson Forest south of Stouffville Road, which supports a wide range of forest interior species (Geomatics International Inc., 1999). Additionally, those lands located north of Stouffville Road may also support a broad range of species as designated wetlands (i.e., the Bloomington Wetlands) are important habitats for a number of avian species as well as vertebrate species (Fenco MacLaren, 1993).

Review of the 2001-2005 *Ontario Breeding Bird Atlas*, which provides data in areas defined by 10 kilometre squares identified that the Study Area Corridor is situated within three (3) areas known as square 17PJ25, 17PJ26 and 17PJ27. Square 17PJ25, which covers the Study Area Corridor from Major Mackenzie Drive north to Crosby Avenue, identifies 65 confirmed breeding bird species and 41 other species of migratory birds with a possible or probable likelihood of breeding within the area.

Square 17PJ26, which covers the Study Area Corridor from Crosby Avenue to approximately 700 m south of Bloomington Road, identifies 59 confirmed breeding bird species and 57 other species of migratory birds with a possible or probable likelihood of breeding within the area. Moreover, square 17PJ27, which is mapped beyond the northern limits of study, identifies 56 confirmed breeding bird species and 47 other species of migratory birds with a possible or probable likelihood of breeding within the area.

Review of the *Richmond Hill Natural Corridor Study* identifies that the Jefferson Forest and vicinity is used as a deer wintering area. It is further noted that approximately 38 bird species were documented within the forest, 17 of which were considered to be species of concern in the TRCA region, with eight (8) species being locally rare or uncommon. Furthermore, nine (9) mammals (three (3) of TRCA concern) and two (2) reptiles (one (1) of TRCA concern) were also documented (Geomatics International Inc., 1999).

Stouffville Road – GO station site

Given the site's adjacency to the Rouge River Headwater Wetland Complex as well as the Jefferson Forest, it is likely that it supports a range of wildlife species. Wildlife was viewed opportunistically during field surveys conducted by AECOM. During an October 31, 2008 field survey, several common birds were identified within the site either visually or through song recognition including black-capped chickadee (*Poecile atricapillus*), common grackle (*Quiscalus quiscula*), American robin (*Turdus migratorius*) and European starling (*Sturnus vulgaris*).

During a breeding bird survey conducted within the vicinity of the Stouffville Road site on June 21 and July 3, 2007, a total of 33 bird species were identified either visually or through call recognition. It is noted that six (6) species including American goldfinch (*Carduelis tristis*), American robin, common grackle, European starling, mourning dove (*Zenaida macroura*) and rock pigeon (*Columba livia*) were observed in higher numbers. At the time of survey, no provincially significant birds were observed (Dillon Consulting, 2007).

Information received from the TRCA identified that in 2002, an ovenbird (*Seiurus aurocapillus*), winter wren (*Troglodytes troglodytes*), wood thrush (*Hylocichla mustelina*) and black-and-white warbler (*Mniotilta varia*) were spotted immediately south of Stouffville Road. As this site is situated within the South Slope Physiographic Region, the area may support a number of sensitive bird species including the American woodcock (*Scolopax minor*), ruffed grouse (*Bonasa umbellus*), cooper's hawk (*Accipiter cooperii*), black-billed cuckoo (*Coccyzus erythrophthalmus*) and hooded warbler (*Wilsonia citrina*), which is considered a Species at Risk in Ontario (TRCA, 2007).

In addition to the bird species above, one (1) amphibian known as a spring peeper (*Pseudacris crucifer*) was spotted in 2007 south of Stouffville Road on the east side of Leslie Street while one (1) mammal known as a mink (*Mustela vison*) was spotted crossing Stouffville Road in a northerly direction on the east side of the above mentioned Rouge River Headwater Wetland Complex (TRCA, 2008). It is further noted that a white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridanus*), grey squirrel (*Sciurus carolinensis*), red

squirrel (*Tamiasciurus hudsonicus*) and eastern chipmunk (*Tamias striatus*) were observed during the June 21 and July 3, 2007 field surveys (Dillon Consulting, 2007).

During field reconnaissance activities conducted by EcoTec on April 1 and 2, 2009, a total of 15 bird species were identified within the Stouffville Road site. Some species included killdeer (*Charadrius vociferous*), blue jay (*Cyanocitta cristata*), black-capped chickadee (*Poecile atricapillus*), and house sparrow (*Passer domesticus*). Eastern gray squirrels were also noted within the vicinity of the study area (EcoTec, 2009). A full list of wildlife species and methodology can be found in **Appendix C** of this report.

Bethesda Sideroad – Layover site

Review of the 1999 *Richmond Hill Natural Corridor Study* identifies 33 bird species situated adjacent to Haynes Lake, which is approximately 750 m northwest of the layover site. At the time of this report, eight (8) of these species were considered of concern in the TRCA Region, with two (2) considered locally rare or uncommon. There were also two (2) mammals, seven (7) amphibians (four (4) of TRCA concern) and two (2) reptiles documented adjacent to the Lake (Geomatics International Inc., 1999). During field reconnaissance activities conducted by AECOM on October 31, 2008, four (4) avian species were recorded within the area either visually or through song recognition, including house sparrow (*Passer domesticus*), American robin, dark eyed junco (*Junco hyemalis*) and American goldfinch.

During field reconnaissance activities conducted by EcoTec on April 1 and 2, 2009, a total of 23 bird species were observed within the Bethesda Sideroad site. Such species included killdeer, ring-billed gull (*Larus delawarensis*), downy woodpecker (*Picoides pubescens*), red-winged blackbird (*Agelaius phoeniceus*), brown-headed cowbird (*Molothrus ater*), and American goldfinch. In addition, eastern gray squirrels and eastern chipmunks (*Tamiam stratus*) were observed within the site, while the presence of striped skunk (*Mephitis mephitis*) was identified through smell recognition (EcoTec, 2009). A full list of wildlife species and methodology can be found in **Appendix C** of this report.

Bloomington Road – GO station site

The Bloomington Road GO station site is situated within the Bloomington Wetlands, which as of 1999 included approximately 50 bird species (Geomatics International Inc., 1999). Of these, 16 were considered to be species of concern in the TRCA Region and seven (7) were considered to be locally rare or uncommon. Additionally, the wetlands supported nine (9) mammals, seven (7) amphibians (four (4) of which are of TRCA concern) and one (1) reptile (Geomatics International Inc., 1999).

Information received from the TRCA identifies several bird species documented south of Bloomington Road including ovenbird, veery (*Catharus fuscescens*), least flycatcher (*Empidonax minimus*), black-billed cuckoo, wood thrush, swamp sparrow (*Melospiza Georgiana*), Virginia rail (*Rallus limicola*) and scarlet tanager (*Piranga olivacea*). Two (2) amphibians were also recorded within the Bloomington site including wood frog (*Rana sylvatica*) and spring peeper (TRCA, 2008).

During field reconnaissance activities conducted by EcoTec on April 1 and 2, 2009, a total of 12 bird species were observed within the Bloomington Road site including mallard ducks, immature red-tailed hawk (*Buteo jamaicensis*), American crow (*Corvus brachyrhynchos*), and eastern meadowlark (*Sturnella magna*). The presence of white-tailed deer (*Odocoileus virginianus*) and rabbit was determined by the presence of tracks,

browse and scat (EcoTec, 2009). A full list of wildlife species and methodology can be found in **Appendix C** of this report.

Bloomington Road – Layover site

As noted above, the Bloomington Road layover site is situated within the Bloomington Wetlands, which supports a wide range of wildlife habitat. Information received from the TRCA identifies a range of bird species that were recorded within and immediately adjacent to the layover site including sharp-shinned hawk (*Accipiter striatus*), wood thrush, ovenbird, yellow-bellied sapsucker (*Sphyrapicus varius*), pileated woodpecker (*Dryocopus pileatus*), northern waterthrush (*Seiurus noveboracensis*), swamp sparrow, ruby-throated hummingbird (*Archilocus colubris*) and bobolink (*Dolichonyx oryzivorus*) (TRCA, 2008). In addition four (4) amphibians were documented in 2001 including wood frog, spring peeper, gray treefrog (*Hyla versicolor*) and northern leopard frog (*Rana pipiens*).

Vandorf Sideroad – GO station

Review of the East Holland River Subwatershed Study identifies the importance of forest interior habitat for wildlife habitat within the fragmented landscape of Southern Ontario. It is noted that many wildlife species sensitive to human and other types of disturbances require forest interior habitats, which is defined as forested areas of a minimum 200 m from the nearest forest edge (LSRCA, 2000).

Field reconnaissance activities indicate that the landscape of this site is not considered forest interior habitat. However, this site may support some wildlife habitat, including a variety of bird species as well as mammals and/or amphibians given the adjacent watercourse. Opportunistic field surveys conducted by AECOM have identified two (2) bird species adjacent to the site including a black-capped chickadee and a great blue heron (*Ardea herodias*), which was observed in flight crossing Woodbine Avenue, immediately south of Vandorf Sideroad.

Aurora Road – Layover facility and GO station sites

Site reconnaissance activities indicate that the Aurora Road layover facility and GO station sites are located at the edges of the interior forest habitat. Thus, these sites represent very high potential for a wide variety of breeding bird species as well as mammals, amphibians and reptiles.

3.1.7 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 Study Area Corridor. This entailed accessing and reviewing the following website registries to provide a framework for the field investigations:

- MNR NHIC database² for rare, threatened and endangered species.
- COSEWIC³ database

² 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.

³ COSEWIC is mandated to assess and designate wildlife species that are considered to be in danger of becoming extinct in Canada.

- Environment Canada’s Species at Risk Registry for species protected by federal legislation called the *Species at Risk Act* (SARA).
- Conservation Ontario 2008 Aquatic Species at Risk.

There are 49 rare species listed in the MNR NHIC database for NTS Map Sheet 30 M/14 and Map Sheet 31 D/3, which geographically covers the Study Area. However, further review (electronic geographic query) of the NHIC database indicates that nine (9) of the 49 species listed within NTS Map Sheet 30 M/14 and Map Sheet 31 D/3 have a mapped range within the Study Area Corridor. These species are listed in **Table 5**.

Table 5. Rare Species Records Within and Adjacent to the Study Area Corridor

SPECIE (SCIENTIFIC NAME)	COMMON NAME	MNR RANK	COSEWIC	SARA
<i>Ixobrychus exilis</i>	Least Bittern	THR	THR	THR
<i>Lanius ludovicianus</i>	Loggerhead Shrike	END	END	END
<i>Clinostomus elongatus</i>	Redside Dace	THR	END	SC
<i>Ambystoma jeffersonianum</i>	Jefferson Salamander	THR	THR	THR
<i>Solidago arguta</i>	Sharp-leaved Goldenrod			
<i>Ambystoma hybrid pop. 1</i>	Jefferson X Blue-spotted Salamander			
<i>Cordulegaster diastatops</i>	Delta-spotted Spiketail			
SPECIE (SCIENTIFIC NAME)	COMMON NAME	MNR RANK	COSEWIC	SARA
<i>Azolla caroliniana</i>	Mosquito Fern			
<i>Somatochlora walshii</i>	Brush-tipped Emerald			

THR: Threatened
END: Endangered
SC: Special Concern

The Conservation Ontario 2008 Aquatic Species at Risk website identifies aquatic Species at Risk by each conservation authority within Ontario. Interactive maps were downloaded and viewed to determine the potential presence of aquatic Species at Risk within the Study Area Corridor.

As illustrated within the TRCA interactive map, all of the seven (7) mapped watercourses along the rail line from north of 19th Avenue to Stouffville Road are labelled as orange, which identifies two (2) aquatic Species at Risk including the Redside Dace and the Atlantic Salmon (*Salmo salar*) (Lake Ontario population).

It is noted within the reference guide of the mapping that projects proposed within orange segments represent the known distributions of fish and/or mussels that are currently designated as Extirpated, Endangered and/or Threatened. These species have not yet been added to Schedule 1 of the federal *Species at Risk Act* (SARA), but are anticipated to be added sometime in 2009. Thus, the SARA provisions do not currently apply to species found in these segments, but could in the near future. Although the Stouffville Road GO station site will avoid the permanent watercourse, it will impact an intermittent channel, which is located south of the existing gravel road

parking lot. It is further noted that the intermittent watercourses that traverse the Bethesda Sideroad layover site are not designated to support any Species at Risk (Meridianwave Consultants Inc., 2008).

Review of the LSRCA interactive map does not identify any designated Species at Risk watercourses for the rest of the Study Area Corridor. However, the Weslie Creek watercourse that traverses Aurora Road and the Aurora Road GO station site is categorized as an orange segment watercourse on the east side of Highway 404, where it traverses Woodbine Avenue. The Species at Risk in this section of watercourse include lake sturgeon (*Acipenser fulvescens*) and redbside dace. As noted above, the SARA provisions do not currently apply to species found in this section of the watercourse, but may apply sometime this year (Meridianwave Consultants Inc., 2008).

3.1.8 Wetland Habitat

There are several wetland habitats present within the Study Area Corridor, many of which are considered Environmentally Significant Areas (ESAs). Details regarding these wetland habitats are discussed below.

3.1.9 Environmentally Significant Areas

Review of the MNR’s NHIC indicates that the Study Area Corridor extends through 13 environmentally significant areas, namely the Oak Ridges Moraine, Jefferson Forest, Jefferson Wetland/Swamp (East Section), Rouge River Headwater Wetland Complex, Wilcox-St. George Wetland Complex, Simeon Lakes ANSI, Simeon Lakes Forest Complex, Bloomington Wetlands, Vandorf Kettles ANSI, White Rose-Preston Lake Wetland Complex, White Rose Bog, LSRCA Groundwater Recharge Area and the Bogart Creek Wetland Complex. The characteristics of each are described below and are mapped within **Figures 8(a) (b) (c)**.

Oak Ridges Moraine

As noted above, the Oak Ridges Moraine (ORM) encompasses almost all of the Study Area Corridor from south of 19th Avenue north to approximately 650 m south of Aurora Road. Thus, all of the GO station sites and layover facilities are directly situated within the Oak Ridges Moraine, with the exception of the Aurora Road GO station site, which is just north of the ORM within the Greenbelt Plan (see **Section 3.2.4**).

The ORM is one of Ontario's most significant landforms. This irregular ridge stretches 160 km from the Trent River in the east to the Niagara Escarpment in the west. The Escarpment and Moraine together form the foundation of south-central Ontario's natural heritage and greenspace systems. Strategically located north of and parallel to Lake Ontario, the Moraine divides the watersheds draining south into western Lake Ontario from those draining north into Georgian Bay, Lake Simcoe and the Trent River system. The Moraine shapes the present and future form and structure of the Greater Toronto region, and its ecological functions are critical to the region's continuing health. Policies protecting this planning area are further described in **Section 3.2.4**.

Jefferson Forest

The Study Area Corridor passes through the Jefferson Forest. Most of the forest area is mapped on the west side of the CNR line between Stouffville Road and 19th Avenue, although it appears that a portion of the mapped area may have been developed in recent years for estate residential land uses. This natural area has been identified locally as an Environmentally Sensitive Area (ESA) and forms part of the Jefferson ANSI. As described above,

the Jefferson Forest is a wet forest with tree species such as white cedar, hemlock, white birch, yellow birch, black ash, and tamarack. As well, the area may consist of speckled alder, mountain maple, ferns, and habitat for orchids. In the past, both nationally and regionally rare plant species, along with regionally rare bird species, have been found in the Jefferson Forest (Fenco MacLaren, 1993).

Jefferson Forest – East Section

The Study Area Corridor passes through the east section of the Jefferson Forest, which contains the Jefferson Wetland/Swamp. The wetland covers an area of 57 ha and is generally located on the east side of the rail line between Stouffville Road and 19th Avenue. This wetland is one of the largest wetlands on the ORM and has been identified as part of the Jefferson Forest ANSI. In addition, this natural area forms part of the Rouge River Headwater Wetland Complex, which is designated by the MNR as a provincially significant wetland. The Jefferson Wetland is also designated locally as an Environmentally Sensitive Area (ESA). Given its location with respect to the Oak Ridges Moraine and the Rouge River System, the wetland is a key area for groundwater seepage (GO, 1993; Geomatics, 1999).

Rouge River Headwater Wetland Complex

Review of the NHIC website characterizes this feature as provincially significant, which forms part of a diverse wetland complex, namely for its headwater wetlands and its adjacent upland woodlands (MNR, 2009). It is further noted that this complex is comprised of 35 wetlands covering a total area of 175 ha. The largest wetland is situated within the southeast portion of the Jefferson Forest ANSI, north of 19th Avenue, which is approximately 65 ha in size. The Stouffville Road GO station is situated on the west side of a smaller wetland complex north of Stouffville Road and will completely avoid this feature.

Wilcox-St. George Wetland Complex

This provincially significant wetland complex is entirely situated within the Town of Richmond Hill and is bounded by Bloomington Road, Leslie Street, Yonge Street and Stouffville Road (MNR, 2009). This wetland complex is large and diverse in nature within the ORM and is noteworthy for its four (4) lakes, its four (4) kettle bogs and its adjacent upland woodlands. Moreover, this wetland complex consists of 90 individual wetlands, for a total size of 102 hectares. 57% of the area is Swamp, 39% is Marsh and 4% is Bog (MNR, 2009). The access road to the Bethesda Sideroad layover site would manoeuvre around a small wetland complex, approximately 2,381 m² on an existing access road. Thus, this site would completely avoid this wetland complex.

Simeon Lakes ANSI

The Simeon Lake North Life Science ANSI is a regionally significant feature comprised of intermediate-aged forests of sugar maple with some beech, hemlock and white birch covering the rolling uplands of this approximately 100 ha site on the south slope of the ORM (MNR, 2009). There are also some scattered wetland pockets within, as well as a valley system containing the headwaters of Bruce Creek. There are no proposed GO facilities within this regionally significant feature.

Simeon Lakes Forest Complex

This forest complex is situated on the east side of Highway 404 within the vicinity of Bethesda Sideroad and Woodbine Avenue. This regionally significant life science ANSI contains a high diversity of community types

including mature deciduous forest, mature-mixed forest, mature coniferous forests wetlands, immature-mixed forests, immature deciduous forests, and Simeon Lakes. There are no proposed GO facilities within this regionally significant feature.

Bloomington Wetlands

The Bloomington Wetlands are considered an environmental significant feature by the TRCA and a provincially significant wetland primarily composed of upland deciduous forest, coniferous plantation and successional forest as well as kettle wetlands with thicket swamp, forest swamp, cattail marsh, meadow marsh, open water marsh and bog (Geomatics International Inc., 1999). A portion of the Bloomington Road GO station site is situated within these wetlands on the east side of the CNR line, while most of the Bloomington Road layover site, with the exception of the southern tracks, are mapped within this wetland.

Vandorf Kettles ANSI

The Vandorf Kettles are considered a provincially significant life science ANSI and are characterized by small ponds, lakes, marshes and swamps. This feature follows a similar outline to the Bloomington Wetlands on the east side of the rail line north of Bloomington Road and is almost entirely within the Bloomington Road layover site. Moreover, the Vandorf Kettles are mapped immediately south of the Vandorf Sideroad GO station site, south of Vandorf Sideroad on the east side of Woodbine Avenue.

White Rose-Preston Lake Wetland Complex

This wetland complex is considered provincially significant and is defined as a large and diverse wetland complex. It is noteworthy for its four (4) kettle lakes, its two (2) kettle bogs and its adjacent upland woodlands (MNR, 2009). This wetland complex is comprised of approximately 77 wetland types, with the most common being cattail marshes covering 30% of wetlands, while another 26% of wetlands are open water aquatic communities. Although the Bloomington Road site would completely avoid the approximately 2,296 m² wetland complex, the Bloomington Road layover site would infringe on a portion of another wetland complex. Moreover, the bus loop access to the Vandorf Station site may infringe on a small portion of a third wetland complex.

White Rose Bog

The White Rose Bog is an open shrub bog centre, which is dominated by leatherleaf, Sphagnum hummocks and pitcher plant, with scattered, stunted black spruce and tamarack surrounded by a mature treed bog. This small bog, which is located on the north side of Bloomington Road is approximately 3 ha in size and was once known to support significant bog plants and approximately 17 regionally rare plants. The Bloomington Road layover site would directly infringe on this bog, as it is situated on the east side of the rail line.

LSRCA Groundwater Recharge Area

Information received from the LSRCA coupled with review of Figure 7.11 – Groundwater Recharge Areas within *East Holland River Subwatershed Study* (2000) have confirmed that such areas are present within the Study Area Corridor, and are considered environmentally significant. Although groundwater recharge can occur anywhere within a watershed, it is considered of greater importance within the ORM, where sand and gravel deposits occur at the surface (LSRCA, 2000). It is further noted that the long term annual groundwater recharge within this designated zone is approximately 250 mm to 275 mm. As illustrated in **Figure 8(c)**, the Vandorf Sideroad GO

station site, Aurora Road layover site and Aurora Road GO station site are all situated within the LSRCA's groundwater recharge area.

Bogart Creek Wetland Complex

Information received from the MNR identifies that the east side of the rail line south of Aurora Road, within the Aurora Road layover facility and GO station sites are situated within this provincially significant wetland complex (Hernandez, 2008).

Review (electronic geographic query) of the MNR's NHIC database confirms the presence of several natural areas within the Study Area Corridor on either side of the CNR line.

3.1.10 Groundwater Resources

Groundwater within the Regional Municipality of York is considered an important aspect of the hydrological cycle and is also a significant source of water supply to many regional residents. It is noted that the southern limits of the Study Area Corridor is under a municipal water system while the residents within the community of Gormley receive their water supply from groundwater resources.

As per the *Oak Ridges Moraine Conservation Plan*, the Region is required to illustrate Wellhead Protection Areas within the ORM. By definition, Wellhead Protection Areas are zones around production where land uses are to be carefully planned as well as restricted to ensure the quality of groundwater supply (York Region Website, 2009). Review of Map 14 – Wellhead Protection Areas in the Region's Official Plan delineates several areas, which range from 150 days to 25 years. It is noted within this figure that there are no Wellhead Protection Areas within the Study Area Corridor.

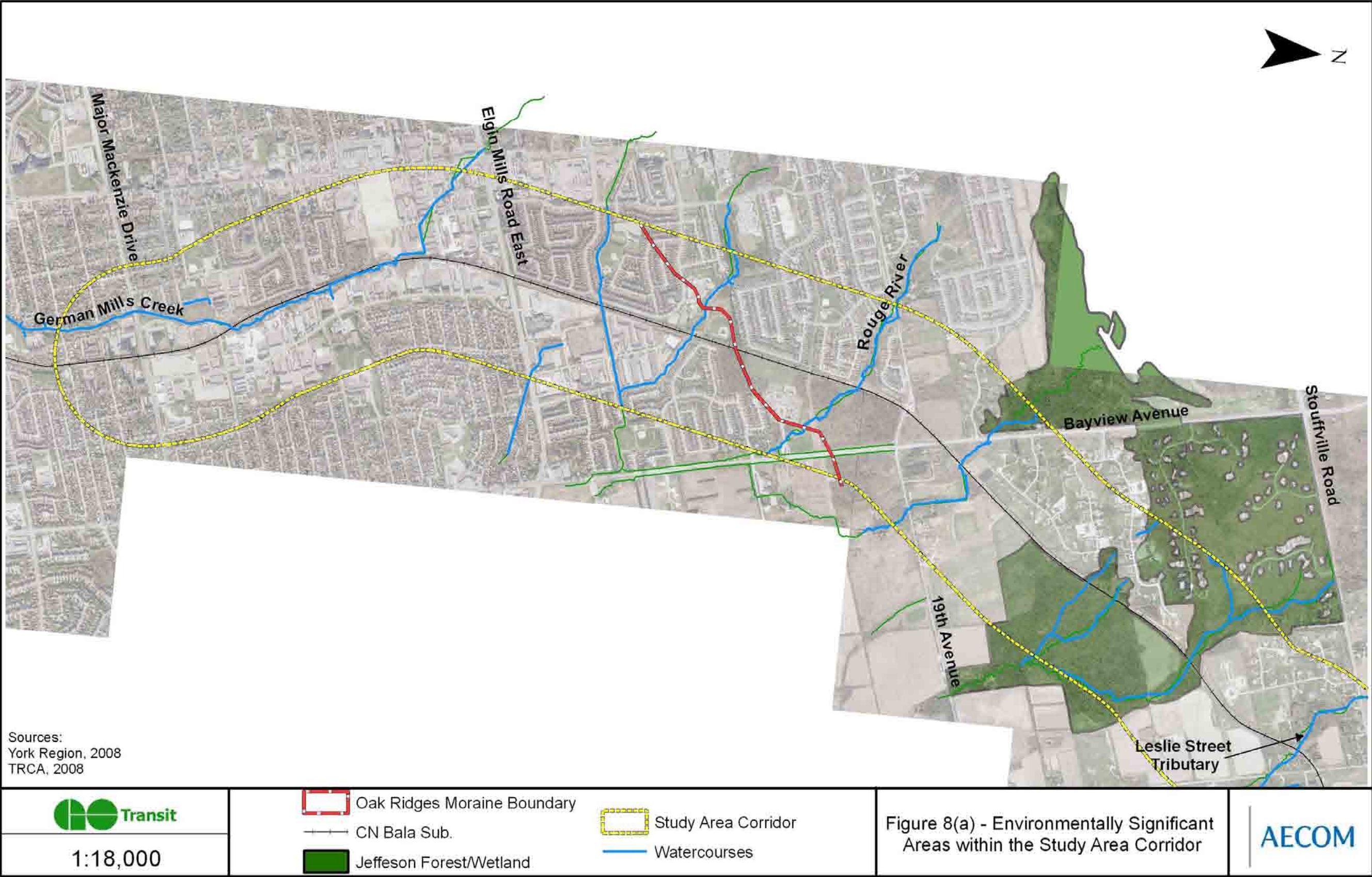
However, as noted in **Figures 4 to 7** and Map 13 – Oak Ridges Moraine Aquifer Vulnerability, there are several areas within the Study Area Corridor that are considered to have high aquifer vulnerability. As noted therein, a portion of the Stouffville Road GO station site and the Bethesda Sideroad layover site are situated within areas of high vulnerability. The entire Bloomington Road and Aurora Road GO station sites are situated within high aquifer vulnerability. A portion of the Vandorf Sideroad GO station site and Aurora Road layover site is situated within this designation.

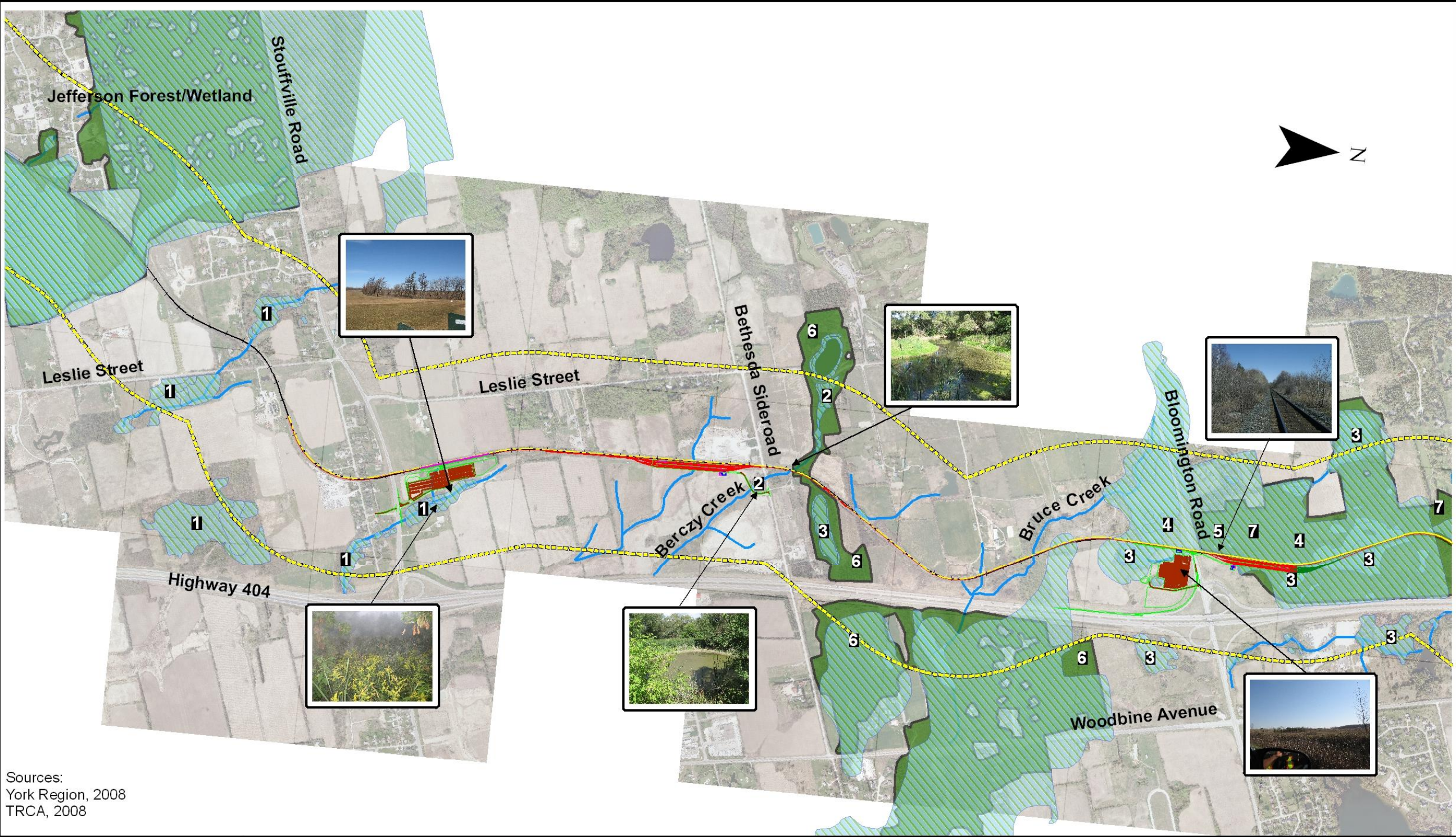
Mapping the areas of high aquifer vulnerability was created as per the provisions of Section 29 and Subsection 42 (1) (c) of the *Oak Ridges Moraine Conservation Plan*. By definition, mapping these areas is considered a tool that can be used to protect groundwater resources and their ultimate use. The purpose of these maps are to identify areas where contamination of surface water is more (or less) likely to result in the contamination of groundwater. As all groundwater is vulnerable to some degree, areas of high aquifer vulnerability are most susceptible to groundwater contamination (MMAH, 2004).

Review of the *Rouge River Watershed Plan* (2007) identifies four (4) major aquifer systems within the Rouge watershed, namely the Shallow System, Oak Ridges Moraine Aquifer, Thorncliffe Aquifer and Scarborough Aquifer. It is noted that groundwater flow within these aquifers for the most part drains in a south to southeast direction towards Lake Ontario (TRCA, 2007). It is further noted that groundwater quality within the Rouge

watershed is good, but has high concentrations of iron, methane, nitrates, chlorides (from nutrients and road salt) and other naturally occurring substances.

As noted above, the GO Transit facility sites within the Town of Whitchurch-Stouffville are in areas of Groundwater Recharge where thick sand and gravel deposits occur at the surface. From a groundwater vulnerability perspective, these recharge areas are considered most vulnerable to contamination due to their high capacity for infiltration (LSRCA, 2000).





Sources:
York Region, 2008
TRCA, 2008













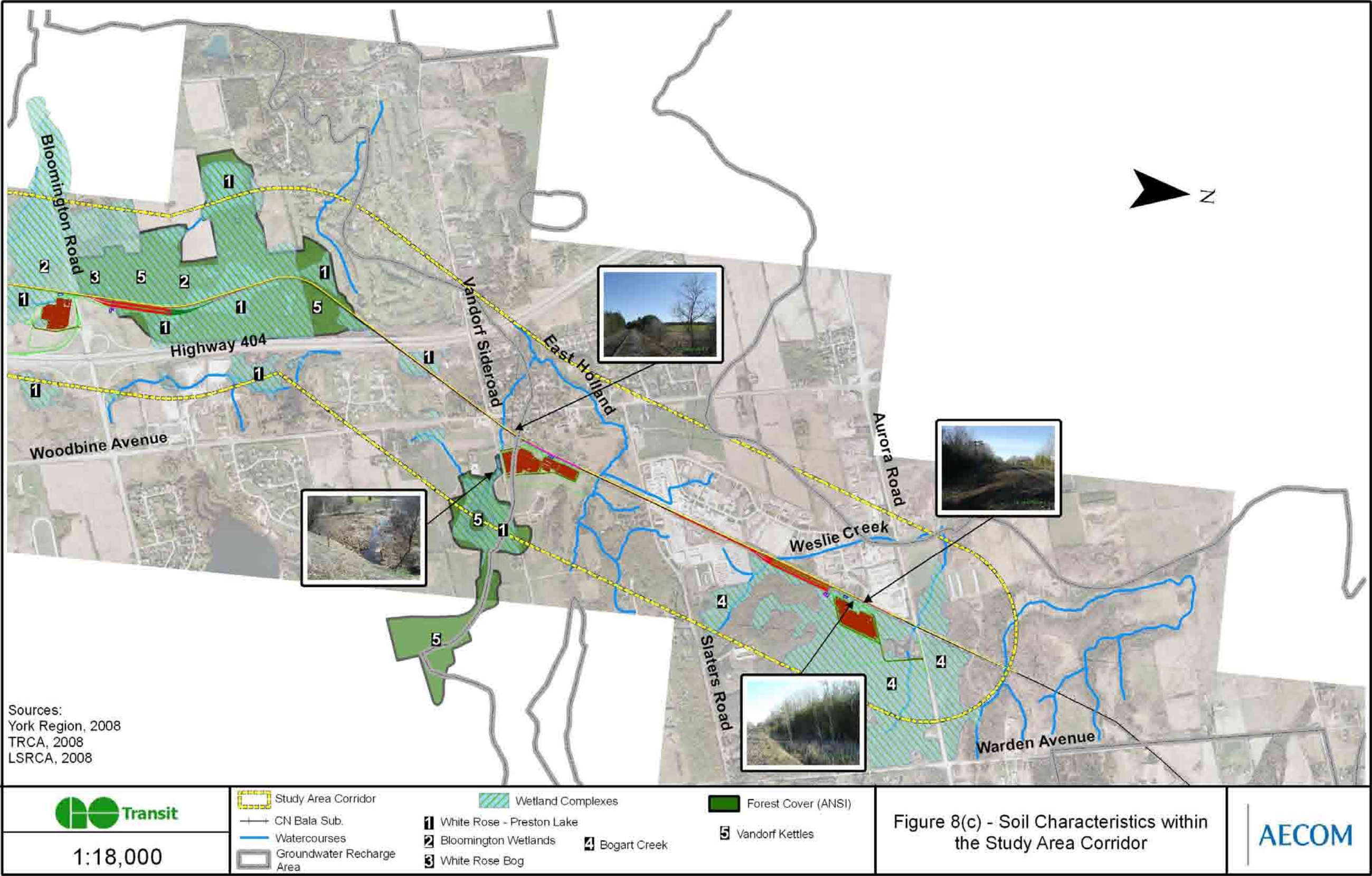
	 Study Area Corridor	 Wetland Complexes	 Rouge River Headwaters	 Bloomington Wetlands	 Forest Cover (ANSI)	 Simeon Lakes (contains wetlands)	 White Rose Bog	 Vandorf Kettles
1:18,000	 CN Bala Sub.	 Watercourses	 White Rose - Preston Lake					

Figure 8(b) - Environmentally Significant Areas within the Study Area Corridor

AECOM



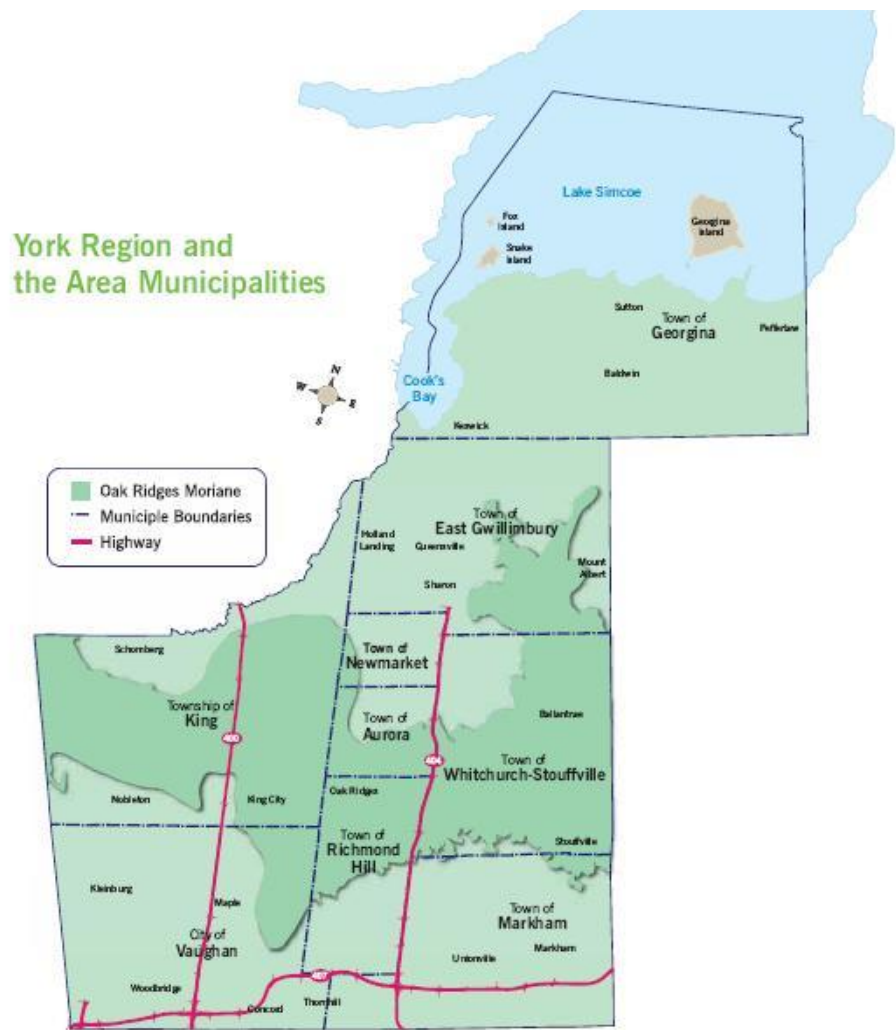
3.2 Socio-Economic Environment

3.2.1 Regional Setting, Economy and Population

The Study Area Corridor is situated within the Town of Richmond Hill, the Town of Aurora and the Town of Whitchurch-Stouffville. These towns form part of the nine (9) area municipalities within the Region of York, as illustrated in **Figure 9** below.

The Region is located directly north of the City of Toronto, and extends northerly for 56 km to the southern shores of Lake Simcoe, which delineates the northern boundary. It is bordered by the Region of Peel and Simcoe County to the west and the Region of Durham to the east, and comprises a total land area of 1,756 km². The Region is centrally located on the northern flank of the GTA, which is the centre of Canada's largest regional economy and financial centre.

Figure 9. York Region and Area Municipalities



(York Region website, 2009)

Originally an agricultural-based economy, the Region transformed rapidly into a residential role, and has, over time, attracted a broad spectrum of business activity. As of 2006, there were approximately 39 private sector companies located within the Region with 500 or more employees (York Region, 2009). **Table 6** shows the top 10 private sector employers within the Region for the year 2006. As noted therein, Magna International is the largest private sector employer followed by IBM Canada Ltd. The list shows the broad diversity of sectors including manufacturing, financial services, construction, communications, recreation and commerce. Today the Region's diversified economy is more buoyant and resilient to cyclical shifts at the national and global scale.

As per Section 3.6 of the Economic Profile of York Region, manufacturing continues to be the dominant employment sector within the Region accounting for approximately 25% of jobs with automotive parts manufacturing accounting for more than 50% of the total manufacturing sector (York Region, 2007). The business services and personal services sector ranked second and third respectively. This growth represents a shift towards a more knowledge-based economy. The Region also has the largest concentration of information technology industries in Canada.

In addition, there are a number of public sector employers with more than 500 employees within the Region. The top public sector employers within the Region for 2006 include the Region (employs the most workers), followed by the South Lake Regional Health Centre, York Central Hospital, Markham Stouffville Hospital, the City of Vaughan, and the Town of Markham.

Table 6. Top Private Sector Employers in York Region (2006)

Rank	Business Name	Location	No. of Employees	Industry Description
1	Magna International Inc.	York Region	11,594*	Manufactures automotive components and systems
2	IBM Canada Ltd.	Markham	7,545	Provides information technology solutions
3	Paramount Canada's Wonderland	Vaughan	4,150**	Theme park
4	Amex Canada	Markham	3,796	Financial services and call centre
5	Saint Elizabeth Health Care	Markham	3,622	Home health care
6	AMD	Markham	2,610	Computer and peripheral equipment manufacturing
7	Royal Group Technologies	Vaughan	2,400	Polymer-based home improvement, manufacturing
8	United Parcel Service Ltd.	Vaughan	1,800	Courier Services
9	CGI Information Systems and Management Consultants Inc.	Markham	1,772	Independent adjusters for insurance claims
10	Miller Paving Ltd.	Markham	1,700	Construction, manufacturing, engineering.

* Includes employees of subsidiary companies located in York Region.

** This includes seasonal employees.

Source: York Region, 2007.

As noted above, the area municipalities within the Study Area Corridor include the Towns of Richmond Hill, Aurora and Whitchurch-Stouffville. As of December 2006, there were approximately 53,600 jobs within the Town

of Richmond Hill, which were predominately service-oriented in nature accounting for 84.3% of employment. Moreover, as of December 2006, there were approximately 17,804 jobs within the Town of Aurora, which were predominately service-providing businesses accounting for 70% of all employment within the town. In 2006, the Town of Whitchurch-Stouffville had approximately 9,363 jobs, with the majority concentrated in service-producing industries, accounting for approximately 70.2% of employment (York Region, 2006).

York Region is one of the fastest growing and most diversified populations in all of Canada. In 2006, the Region's population accounted for 16.9% of the Greater Toronto Area's (GTA) population estimated at 5.6 million people. As of December, 2007, the Region's population was estimated to be 983,056, with a future anticipated growth to reach 1.5 million people by the year 2031. As noted within **Table 7** below, while all municipalities in York Region are growing, the largest population in 2006 was concentrated within the Town of Markham, followed by the City of Vaughan and the Town of Richmond Hill. The Region's rapid population growth is due, in part, to its proximity to the City of Toronto, and its central location within the GTA.

Table 7. Population Forecasts for the Region of York and Area Municipalities

	1996	2006	2011	2016	2021	2026
Aurora						
Population	36,000	49,150	56,000	63,000	69,000	75,000
Employment	14,600	19,000	22,000	26,000	30,000	33,000
East Gwillimbury						
Population	20,400	24,400	32,000	41,000	51,000	60,000
Employment	4,600	7,000	9,000	12,000	16,000	20,000
Georgina						
Population	35,900	45,600	51,000	59,000	67,000	74,000
Employment	7,500	10,000	13,000	16,000	20,000	22,000
King						
Population	18,800	20,350	25,000	29,000	32,000	35,000
Employment	6,100	7,000	8,000	10,000	11,000	12,000
Markham						
Population	179,100	273,800	281,000	304,000	326,000	348,000
Employment	97,600	148,000	169,000	185,000	200,000	212,000
Newmarket						
Population	59,000	78,250	87,000	91,000	95,000	98,000
Employment	27,200	37,000	41,000	43,000	45,000	46,000
Richmond Hill						
Population	105,100	173,950	191,000	204,000	212,000	219,000
Employment	43,100	79,000	94,000	106,000	115,000	119,000
Vaughan						
Population	136,900	243,700	254,000	281,000	305,000	330,000
Employment	83,300	151,000	172,000	188,000	202,000	215,000
Whitchurch/Stouffville						
Population	20,500	26,150	31,000	35,000	38,000	41,000
Employment	7,500	10,000	12,000	14,000	16,000	17,000
York						
Population	611,700	933,350	1,008,000	1,107,000	1,195,000	1,280,000
Employment	291,500	468,000	540,000	600,000	655,000	696,000

Source: (York Region website, 2009).

3.2.2 Existing Land Uses

The existing land use within the Study Area Corridor is primarily rural/agricultural, industrial and urban/residential, within some recreational and forested type land uses. The Study Area Corridor from south of Major Mackenzie Drive to 19th Avenue are predominately urban and residential. It is noted that the rail line runs through the Newkirk Business Park. Recent aerial mapping indicates that this business park is located approximately between Cedarhurst Drive and Major Mackenzie Drive.

The Study Area Corridor also includes a variety of recreational and community facilities throughout the Town of Richmond Hill. The features described herein are found either adjacent or in close proximity to the rail line. These features are interspersed throughout the corridor and are located on either side of the rail line. Review of the Town of Richmond Hill Parks and Trails Guide identifies several recreational parks within the corridor including Palmer Park, Crosby Park, Newkirk Park, Wilbourne Park, Dove Park and Newberry Park. Each of the parks provides playground and/or sporting facilities. All but the Winbourne Park and Crosby Park offer natural areas (Town of Richmond Hill, 2006).

In addition, there are four (4) trails/natural channels in close proximity to the CNR line. These include the Elgin East Channel Lands, which is a natural area corridor extending from the west side of the rail line, south of 19th Avenue, as well as from two (2) other locations on the east side of the CNR line, south of Newberry Park and immediately south of Dove Park. The Trans Richmond Trail is considered as a natural area that extends from the west side of the rail line, south of 19th Avenue. One (1) community centre, the Centennial Pool and Fitness Centre, is setback on the east side of the CNR line, north of Crosby Avenue (Town of Richmond Hill, 2006).

Lands north of 19th Avenue to Stouffville Road are used for cultivated farming and in some small pockets for pasture and for growing corn or hay. Other pockets of woodlands and farm operations including a horse farm and a cash crop establishment are situated adjacent to the CNR line and Leslie Street respectively, while the community of Gormley is considered a rural non-farm residential establishment (Stantec Consulting, 2005). Details pertaining to the existing land uses within each GO Transit site are provided below.

Stouffville Road – GO station site

Existing land uses within the Stouffville Road GO station site includes one (1) small agricultural corn field immediately north of Stouffville Road followed by a small shrub line and a seasonal recreational facility. This facility is known as the Golden Ridge Golf Club with a gravel parking lot, which offers several golf facilities including a driving range, miniature golf, covered practice stations and a teaching academy. It is noted that the driving range is situated on idle scrub lands (Stantec Consulting, 2005). Additionally, there is one (1) residential establishment located on the east side of the woodlot as well as one (1) culturally significant abandoned residential property approximately 250 m north of the driving range tees.

Bethesda Sideroad – Layover site

The Bethesda Sideroad site is on vacant cultivated agricultural lands. As noted above, the site will directly cross Berczy Creek, which travels north of the site and drains into Haynes Lake. It is noted that those lands directly adjacent to the creek are classified as idle scrub. Field reconnaissance activities conducted by AECOM have confirmed that this site has been heavily disturbed by human activities, as well as heavy construction equipment. There is an existing access road off the south side of Bethesda Sideroad, which crosses Berczy Creek and terminates on the east side. At the time of the site visit, signs of illegal dumping on the roadway were evident.

Additionally, Berczy Creek on the north side of Bethesda Sideroad appeared to contain illegal dumping. There is one (1) residential property located immediately north of Bethesda Sideroad and one (1) commercial property known as Miwel Construction Ltd. located on the west side of the CNR line. Hydro One also operates a Gormley DS power facility on the west side, which is completely fenced.

Bloomington Road – GO station site

The Bloomington Road GO station site is situated to the west of Highway 404, south of Bloomington Road. As noted above, this site is within several environmentally significant areas including the Bloomington Wetlands. Thus, a portion of this site is defined as containing woodland features, however much of the site footprint is within idle scrub lands, which have previously been disturbed from the adjacent highway. There are no commercial, recreational or residential establishments within 500 m of this site.

Bloomington Road – Layover site

Similar to the Bloomington Road GO station site, there are no commercial/recreational/residential establishments within 500 m of this site. Although idle scrub is present within the general area, the site is generally characterized by significant environmental areas as described above, including woodlands, swampy areas and/or bogs.

Vandorf Sideroad – GO station site

This site is situated in the vicinity of the Community of Vandorf, on the east side of Woodbine Avenue, north of Vandorf Sideroad. The site is predominately situated on grassland/idle scrub with sporadic lowland treed areas adjacent to the CNR line. In addition, it is situated adjacent to a branch to the East Holland River as well as several residential/commercial establishments located to the south and to the east of the site.

Aurora Road – Layover facility and GO station sites

Both the Aurora Road layover facility and GO station sites are situated on the east side of the CNR line, south of Aurora Road. The lands are predominately forest cover and/or wetland features. There is one (1) residential facility immediately adjacent to the access road of the site on the west side as well as a small pond within this property. Additionally, there is a large lumber supply commercial establishment south of the site located at # 5532 Slater's Road. A large industrial area is located on the west side of the CNR line, south of Aurora Road and on either side of Ram Forest Road. This area includes several industrial/commercial establishments.

3.2.3 Municipal Planning Policies and Designated Land Uses

As noted above, the Study Area Corridor is situated within the Town of Richmond Hill, Aurora and Whitchurch-Stouffville and the Region of York. The Region has a two-tier planning system whereby planning responsibilities are divided between the Region and its nine (9) area municipalities. From a planning perspective, the sites will impact both the Region (upper-tier municipality) and the applicable lower-tier municipalities. Since they are both responsible for regulating land use and establishing policies for physical, economic and social development within their respective jurisdiction, details regarding the applicable planning policies for each are provided below.

York Region Official Plan

The York Region Official Plan was adopted by Council in 1994 and an amended version was consolidated in 2008. The Official Plan serves as a tool to manage growth to the year 2026. According to Map 6 of the Regional Official Plan, the Study Area Corridor passes through the Agricultural and Rural Policy Areas.

The 'Agricultural Policy Area' consists mainly of those lands south of 19th Avenue, north of Elgin Mills Road and is of Canada Land Inventory (CLI) soil classifications 1 to 4 and farmed organic soils. Farming is the primary use permitted for this area with an overall objective to support a healthy agricultural industry as an essential element of the Region's economy. Uses that would conflict with agricultural operations shall not be permitted within productive farming areas (Region Official Plan, 2008).

The 'Rural Policy Area' includes the remainder of the corridor from north of 19th Avenue and is comprised mainly of Canada Land Inventory soil classifications 5, 6 or 7 lands. The uses permitted in the rural areas include agriculture, forestry, conservation and farm-related activities. Non-agricultural uses are permitted in rural areas upon completing a needs and impact analysis. Rural areas consist of environmentally significant features, such as the Oak Ridges Moraine.

Regional Transportation Policies

As per Section 6.2 of the Regional Official Plan, the objectives of a transit network includes providing transit services that is convenient, accessible and equitable to all residents within the Region and to provide rapid transit services as early as possible that links Regional Centres with adjacent urban areas. Among others, it is the policy of Council to:

- Co-operate with area municipalities, including GO Transit, the Toronto Transit Commission (TTC) and ministries within the province in the planning, coordination, integration and operation of existing and new transit services and to encourage increases in transit modal splits across the Region;
- Support a consistent and equitable transit fare strategy throughout the Region and ensure a similar fare structure with integrated transit services;
- Promote the implementation of a regional rapid transit network including, but not limited to, all day two (2) way services on the Richmond Hill, Stouffville and Bradford GO Transit lines, extension of the Richmond Hill GO rail line to the Highway 404/Bloomington Road area and additional GO Transit rail inter-modal stations, as required within and beyond the Region (Region Official Plan, 2008).

York Region Transportation Master Plan

York Region's Transportation Master Plan (TMP) was approved by Regional Council in 2002. The TMP defines the long-term transportation vision that will support the Region to the year 2031. At the time of preparing this report, the Region was undertaking a TMP update. As the demographic of the Region continues to change, an update of the Plan is needed to ensure an integrated transportation network can be achieved within the context of recent development trends, as well as in the context of recently approved provincial planning policies, including growth management policies.

Review of the 2002 TMP includes a comprehensive long-term strategy to improve the Region's transit network. Among the infrastructure and service improvements, the transit network plan recommends the expansion of the existing GO Transit commuter rail service along the CN Bala Subdivision from Major Mackenzie Drive to

Bloomington Road, as well as a potential new GO Transit rail station at the junction of the CNR line at 19th Avenue, Stouffville Road and Bloomington Road (York Region, 2002).

Town of Richmond Hill Official Plan

The current Official Plan for the Town of Richmond Hill Planning Area was adopted by the Town of Richmond Hill Council in December, 1981. Given that the Town's current Official Plan is more than 25 years old, and was last consolidated in 1998, the Town is currently in the process of updating its Strategic Plan and Official Plan. In order to develop a new Official Plan, a number of background studies and discussion papers are currently under way to form the basis of a new land use policy framework. Once the new Official Plan is complete, it will provide a future land use vision for the next 25 years. Currently, the Town's existing Official Plan, which was consolidated on December 31, 1998, applies to the Study Area Corridor.

Schedule A – Land Use of the Official Plan maps the Richmond Hill portion of the Study Area Corridor within the boundaries of the South Urban Development Area. Also referred to as the Richmond Hill community, this area is bounded by Bathurst Street, Highway 7 (Langstaff Road), Highway 404, approximately one lot north of Elgin Mills Road, Bayview Avenue, and 19th Avenue/Gamble Road. The rail line runs through the South Urban Development Area from approximately Major McKenzie Drive to 19th Avenue.

The South Urban Development Area is intended to be the major activity centre for the Town, where the majority of residential, commercial, industrial and institutional facilities are and will be located. In relation to the CN Bala Subdivision line, the major industrial service, commercial and/or business park uses are planned to be located north of Elgin Mills Road and east of the rail line, south of Elgin Mills Road and east of Yonge Street, and west of Bayview Avenue and east of the rail line.

Land uses surrounding the rail line are designated as 'Residential', 'Special Policy Area', 'Industrial', 'Hazard Lands', 'Major Open Space', 'Urban Fringe Area' and 'Rural'. The following public services are permitted in all land use designations, with the exception of lands designated as 'Hazard Lands', which are subject to specified conditions or to an amendment to the Restricted Area (Zoning) by-law:

- water supply, sewage and drainage facilities, gas, telephone and cable television transmission utility services
- public roads and railway lines
- municipal, government buildings and facilities, including libraries and other community service centres
- public parks and public recreation facilities
- postal facilities.

Much of the lands throughout the Study Area Corridor from approximately Major Mackenzie Drive to 19th Avenue are mapped as 'Residential Area'. The main uses permitted for residential areas include single-detached, semi-detached and duplex dwellings (Town Official Plan, 1998). 'Special Policy Areas' are lands designated adjacent to the German Mills Creek in the southern portion of the Study Area Corridor. These lands are subject to regional flood conditions and development may occur provided an improvement program is completed for the creek.

For the most part, lands surrounding the rail line from Major Mackenzie Drive to approximately Cedarhurst Drive are designated as 'Industrial Area' (specifically east of the rail line from Major Mackenzie Drive to Cedarhurst Drive and west of the rail line from Stephenson Crescent to Elgin Mills Road). The main uses permitted on these lands are for industrial proposes, such as manufacturing, processing (including information, research and

development), servicing, warehousing, and wholesaling. It is noted that industrial uses which are considered to be a noxious trade, business or manufacture under the *Public Health Act* are not permitted on these lands. As well, outdoor storage is only permitted in certain areas, such as on Enford Drive, west of the rail line.

The Study Area Corridor crosses several areas designated as 'Hazard Lands'. 'Hazard Lands' have inherent physical hazards, such as flood susceptibility, steep slopes, erosion susceptibility, and wet organic soils. Uses permitted on Hazard Lands are limited to conservation, forestry, agriculture, horticultural nurseries, wildlife management areas, parks, and recreational uses. It is noted that buildings and structures are only permitted if they are intended for flood and erosion control and meet the requirements of the Town and the local conservation authority. As well, any plan to alter a watercourse or valley, including the placement of buildings, structure or fill, is subject to approval by the local conservation authority and the MNR, where applicable.

The rail line runs adjacent to two areas designated as 'Major Open Space'. These areas have been identified east of the rail line from the TransCanada Pipeline Gas utility corridor to approximately Rawlings Avenue, and east of the rail line from Taylor Mills Drive to Crosby Avenue. The predominant uses permitted for this designation include recreation (including any necessary buildings or structures), leisure, and conservation.

Lands to the west of the rail line from Leslie Street to Bayview Avenue are designated as 'Urban Fringe Area'. The main uses permitted for this designation include agriculture, estate residential, and low intensity uses such as nursery gardening, forestry, cemeteries, conservation areas, parks, golf courses and recreation clubs.

Most of the lands surrounding the rail line from the area of Leslie Street to Bloomington Road and further along the east side of the rail line from Leslie Street to Bayview Avenue, are designated as 'Rural Area'. Agriculture is the predominant use permitted on rural lands. As such, the main permitted uses for lands designated as 'Rural Area' include agricultural activities, nurseries, greenhouse operations, riding stables, market gardening and other low intensity uses such as conservation areas, parks, golf courses, cemeteries, campgrounds, and forestry.

Also permitted are buildings and structures that are deemed to be essential to the above uses. It is noted that both the Stouffville Road and Bloomington Road GO station sites as well as the Bethesda Sideroad layover facility are within the 'Rural Area' land use designation. Moreover, the Stouffville Road GO station and the Bethesda Sideroad layover sites will traverse a portion of the 'Hazard Lands' discussed above.

Review of Schedule 3 – Environment within the Town's Official Plan delineates the area south of Bloomington Road as an 'Environmentally Sensitive Area' and an 'Aggregate Resource Protection Area'. Areas mapped as 'Environmentally Sensitive Area' are defined by areas of land or water bodies that contain significant environmental features including marshes, swamps, bogs, valleylands, rare or high-quality plant or animal communities, woodlots and other environmental features that warrant protection of preservation. As these areas are situated within the ORM, development within the subject lands may include an environmental analysis, which identifies natural environmental inventories affected by development, potential impacts and mitigative measures.

'Aggregate Resource Protection Area' has been identified as having a high potential for the occurrence of aggregate resources. In addition to land uses included in the 'Rural Area' designation, land uses permitted within include the extraction of gravel, sand, stone and other aggregates, accessory uses to the primary use and crushing, screening, washing and stockpiling aggregates as long as the license for the operation is valid (Town Official Plan, 1998).

Town of Richmond Hill Transportation Policies

The Town maintains jurisdiction over local public roads, transit, pedestrian and bicycle path facilities. Among the transportation policies in the Official Plan (1998), it is stated that the Town shall work with the Federal and Provincial Governments and the Region of York to eliminate at-grade crossings, wherever warranted. Transit policies that support the concept of a commuter rail line include:

- “the use of public transit shall be encouraged and promoted and service will be increased as population and demand increase.”
- “local transit routings shall be integrated with and supportive of inter-regional and inter-municipal public transit systems.”

Other Relevant Policies (Town of Richmond Hill)

Additional policies of the Official Plan (1998) applicable to railway activities include:

- Buffering – “Uses including road and rail activities which are obnoxious due to noise, dust, odour or their visual characteristics shall generally not be located where their effects will have an adverse impact upon Residential Areas or other incompatible uses. Where incompatible uses are proposed to locate in close proximity to each other, appropriate studies in conjunction with the Ministry of the Environment and other appropriate agencies will be undertaken to determine the extent of the adverse effects and methods required to mitigate problems to a desirable level.”
- Noise and Vibration Control – “Areas requiring noise and vibration analysis are considered to be those lands lying within 300 meters (988 feet) of active railway lines.”

Official Plan Amendment No. 218

The purpose of the Official Plan Amendment (OPA) No. 218 is to implement Section 9 (2) of the *Oak Ridges Moraine Conservation Act* 2001 (Bill 122), which requires municipalities to prepare and adopt an OPA that implements the policies of the *Oak Ridges Moraine Conservation Plan* (Ontario Regulation 140/02) as discussed below. This amendment includes:

- Amendments to the existing schedules to the Town Official Plan to identify the boundaries of the Oak Ridges Moraine in accordance with the *Oak Ridges Moraine Conservation Plan*;
- The adoption of new schedules to designate lands within the Town consistent with the land use designations in the *Oak Ridges Moraine Conservation Plan*;
- Amendments within the existing Town Official Plan to change the wording or to delete entire sections in order to bring it into conformity with the *Oak Ridges Moraine Conservation Plan*; and
- Amendments to the text of the Official Plan to incorporate new policies and definitions required to achieve consistency of the *Oak Ridges Moraine Conservation Plan* (Richmond Hill Amendment No. 218).

The location of OPA No. 218 includes the entire Town of Richmond Hill, which is within the Oak Ridges Moraine. It is noted that the Stouffville Road and Bloomington Road GO station sites as well the Bethesda Sideroad layover site are within the boundaries of the *Oak Ridges Moraine Conservation Plan* and are subject to OPA No. 218. A detailed description of the *Oak Ridges Moraine Conservation Plan* is outlined below.

Official Plan Amendment No. 237

The Official Plan Amendment (OPA) No. 237, which is also referred to as the West Gormley Secondary Plan, supports a planned residential community with a supporting road network, parkland, school and commercial uses. The lands subject to this Secondary Plan are situated within the area bounded by the realigned Bayview Avenue to the west, Leslie Street to the east, Bethesda Sideroad to the north and Stouffville Road to the south, totalling an area of approximately 360 ha.

Personal communication with the planning department at the Town of Richmond Hill (De Freitas, 2008) noted that there are several units within this area that have previously submitted development applications. It is further noted that the sites on the west side of Leslie Street, north of Stouffville Road and south of Bethesda Sideroad are currently at the Ontario Municipal Board (OMB) pending a hearing.

Moreover, as identified within the Plan, before any applications can be approved, an updated/revised Master Environmental Servicing Plan (MESP) is required to be approved by the Town as well as the TRCA, which demonstrates conformity with the *Oak Ridges Moraine Conservation Plan*. It will also need to confirm the ability of providing sewer and water services within the Secondary Plan Area. A list of proposed development units are described below:

Site No. 19T-03R17 (Casa Developments Inc.)

This site is located on the east side of the realigned Bayview Avenue, immediately south of Bethesda Sideroad. It is noted that Casa Developments Inc. submitted an application for residential development and mixed use in 2007, but that application was considered to be incomplete and has not since then been resubmitted. The site was to include approximately 1,700 units comprised of low, medium and high density residential uses.

Site No. 19T003R18

This unit is situated immediately west of Leslie Street, south of Bethesda Sideroad and includes approximately 262 single family detached units and approximately 62 townhouse units.

Site No. 19T003R19

This unit is situated immediately south of the above mentioned unit 19T003R18, on the west side of Leslie Street and includes approximately 392 single family detached units and approximately 110 townhouse units.

Site No. 19T003R21

This unit is situated immediately south of the above mentioned unit 19T003R19, on the west side of Leslie Street and includes approximately 270 single family detached units and approximately 151 townhouse units.

Site No. 19T003R20

This unit is situated immediately south of the above mentioned unit 19T003R21, on the west side of Leslie Street and includes approximately 106 single family detached units and approximately 108 townhouse units.

Town of Aurora Official Plan

The Town of Aurora Official Plan was adopted by Council on June 27, 1991 and was consolidated on March, 2008. The Official Plan aims to provide an overall planning framework for future growth within the Town to 2016. Review of Schedule A – Land Use Plan identifies the area north of Bloomington Road, on the east side of the rail line, as ‘Oak Ridges Moraine Natural Linkage Area’ (Town Official Plan, 2008). Information pertaining to this land use designation is discussed below under the *Oak Ridges Moraine Conservation Plan*.

Official Plan Amendment No. 48

Similar to Official Plan Amendment (OPA) No. 219 discussed above under the Town of Richmond Hill, the purpose of this amendment is to bring the Town of Aurora Official Plan into conformity with the *Oak Ridges Moraine Conservation Plan* (Ontario Regulation 140/02) as per the *Oak Ridges Moraine Conservation Act* of 2001. Thus, the Bloomington Road layover site is subject to these policies as it is the only site situated within OPA No. 48 (Town of Aurora, 2004).

Proposed Development

Review of Figure 1 – Planning Applications Map from the Town of Aurora website identifies an application by Lebovic Enterprises Limited on the west side of the rail line for an Official Plan Amendment and rezoning to permit 75 condominium units as well as an 18-hole golf course. It is noted that a Master Environmental Servicing Plan was submitted in September, 2006. Personal communication with the Manager of Policy Planning at the Town of Aurora (Kyle, 2008) confirmed that the application has not been approved and that there are no other planned developments within the Study Area Corridor in Aurora.

**Town of Whitchurch-Stouffville Official Plan /
Official Plan Amendment No. 113**

Further to a meeting with Mr. Andrew McNeely (Director of Planning & Building Services) and Mr. T.E. Parry (Director of Engineering & Capital Projects) at the Town of Whitchurch-Stouffville dated November 19, 2008, it was noted that the proposed GO facilities within the Town will be subject to the proposed modifications to OPA No. 113. Similar to OPA No. 219 within the Town of Richmond Hill and OPA No. 48 within the Town of Aurora, OPA No. 113 represents land use policies and designations that conform to the *Oak Ridges Moraine Conservation Plan* (Ontario Regulation 140/02) as per the *Oak Ridges Moraine Conservation Act* of 2001. During the meeting, it was noted that OPA No. 113 has not yet been approved due to a series of modifications arising from discussions with the Province.

Proposed Development

Further to discussions with the Town of Whitchurch-Stouffville, it was estimated that 12 development applications have been submitted within and adjacent to the proposed Vondorf GO Station. However, pending approval of OPA No. 113, none of the development applications have been approved.

3.2.4 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 Study Area Corridor is situated within a number of provincial planning policy areas, as described below.

The Planning Act

The *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 (Dillon Consulting, 2008).

Provincial Policy Statement

The *Provincial Policy Statement* (PPS) is the complimentary 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 *Planning Act* requires that the PPS be reviewed periodically to make sure its policies are still effective. The new PPS (2005) 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).

Growth Plan for the Greater Golden Horseshoe

In recognition of the Greater Golden Horseshoe’s (GGH)⁴ 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

⁴ 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).

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).

On June 16, 2006, the Province of Ontario released its *Growth Plan for the Greater Golden Horseshoe* (MPIR, 2006). 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 (MPIR, 2006). 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 (MPIR, 2006). 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" (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 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 York as an 'Inner Ring'. Moreover, Richmond Hill/Langstaff Gateway 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 the Region of York as reaching a population of 1,060,000 by 2011, 1,300,000 by 2021 and 1,500,000 by 2031. Similarly, employment within the Region is projected at 590,000 by 2011, 700,000 by 2021 and 780,000 by 2031. Population projections for the Region and its member municipalities are identified in **Section 3.2.1** above.

Growth Forecasts for the Greater Golden Horseshoe

This Growth Outlook for the Greater Golden Horseshoe provides population, household and employment forecasts within the Greater Golden Horseshoe (GGH) to the year 2031 using three (3) different growth scenario methods, namely 'Current Trends', 'Compact' and 'More Compact'. The 'Current Trends' focuses on current policy intervention, current and future settlement patterns and the provision of necessary infrastructure to support growth. Moreover, the other two (2) scenarios are more policy-based, including specific input from the Province and Committees to implement greater levels of policy intervention required to achieve set objectives. This report was formed in collaboration with Hemson Consulting Ltd., the Ministry of Public Infrastructure Renewal, the Ministry of Municipal Affairs and Housing and other municipalities within the GGH.

As noted within the report, the Region of York will continue to steadily increase in population, occupying its remaining designated land as well as its planned centres and corridors. The Region will revisit the rapid suburban type growth over the last 25 years and take on more urban characteristics including a greater diversity in housing and employment forms (Hemson Consulting, 2005).

As per the population scenario comparison (2031) for the Regional Municipality of York, it is noted that under 'Current Trends', the Region's growth is projected to reach 1,530,000, while with the 'Compact' scenario it will reach 1,500,000 and with the 'More Compact' scenario it will reach 1,450,000 people by the year 2031. Similarly, employment is anticipated to reach 780,000 for both 'Current Trends' and the 'Compact' scenario and 750,000 with the 'More Compact' scenario (Hemson Consulting, 2005).

Oak Ridges Moraine Conservation Plan

In May 2001, the Minister of Municipal Affairs and Housing introduced the *Oak Ridges Moraine Protection Act*. The Act provided for the establishment of the *Oak Ridges Moraine Conservation Plan* by regulation. On April 22, 2002, Ontario Regulation 140/02 - *Oak Ridges Moraine Conservation Plan*, was released and deemed to come into effect on November 17, 2001. The Plan builds on years of effort by provincial ministries, the Regions of Durham, Peel and York (Tri-Regional Oak Ridges Moraine Strategy), the Conservation Coalition, Moraine-area municipalities and key stakeholders, to provide clarity and certainty about the long-term protection and management of this vital natural resource (MMAH, 2009). The decisions of provincial ministers and agencies made under the *Planning Act* or the *Condominium Act*, 1998 or in relation to a prescribed matter are required to conform to this Plan.

In 2002, the province of Ontario introduced the Oak Ridges Moraine Conservation Plan under the *Oak Ridges Moraine Conservation Act* (2001), to establish the direction for protecting, restoring and enhancing the ecological and hydrological features of one of Ontario's most significant landforms. Local and municipal official plans must conform to the Conservation Plan.

The *Oak Ridges Moraine Conservation Plan* is an ecologically based plan established by the Ontario government to provide land use and resource management direction for the 190,000 ha of land and water within the Moraine. Through the legislation and the Plan, the Ontario Government has set a clear policy framework for protecting the Oak Ridges Moraine (MMAH, 2009).

The Conservation Plan designates land use within the Oak Ridges Moraine as 'Natural Core Areas', 'Natural Linkage Areas', 'Countryside Areas', 'Settlement Areas' 'Rural Settlements' and 'Palgrave Estates Residential Community'. Land uses within the Study Area Corridor south of 19th Avenue on either side of the rail line are designated as 'Settlement Areas', while those lands north of 19th Avenue are designated as 'Countryside Area', 'Natural Linkage Area' around the traversing watercourses, including the Leslie Street Tributary, 'Natural Core Area' around the Jefferson Forest and 'Rural Settlements' within the Community of Gormley.

'Settlement Area' represents a range of communities where urban uses and development are permitted. Such areas include urban uses and development as set out in applicable Official Plans. Specifically, these areas are designated for development of an urban type landscape including a range of residential, commercial, industrial and institutional uses. Areas designated as 'Rural Settlements' are considered existing hamlets or smaller established communities that are identified in Official Plans.

'Countryside Area' provides an agricultural and rural transition and buffer between Natural Core Areas, Natural Linkage Areas and the urbanized Settlement Areas. As natural features are protected in this area, it is noted that most land uses typically allowed in agricultural and other rural areas are also permitted.

As per Part II, Section 13 of the Conservation Plan, land uses permitted within this designation include several natural environmental conservation methods, agricultural uses, transportation, infrastructure and utilities as described in Section 41, among others (MMAH, 2002). Further review of Section 41 of the Plan includes transportation uses such as public highways, transit lines, railways and related facilities, gas and oil pipelines, power transmission lines, sewage and water systems including storm water management facilities, telecommunication lines and facilities, bridges, interchanges stations and other structures. It is noted that the Stouffville Road GO station site is partially situated within this land use designation.

'Natural Linkage Area' protects natural and open space linkages between the Natural Core Areas and along rivers and systems. Land uses permitted within this designation include environmental conservation, agricultural uses, home businesses and industries, aggregate operations, transportation facilities only if the need for the project has been demonstrated and there is no reasonable alternative, and others. Thus, the policies outlined above under Section 41 generally apply to this land use designation. A portion of the Stouffville Road GO station site, the Bethesda Sideroad and Bloomington Road layover sites, and the Bloomington Road and Vandorf Sideroad GO station sites are within this land use designation.

'Natural Core Area' represents lands with the greatest concentrations of key natural heritage features. Existing land uses and some limited resource management, agricultural, recreational, home businesses, transportation and utility uses are subject to Section 41 of the Plan. The majority of the Aurora Road layover facility is situated within this land use designation (MMAH, 2002).

As further noted within the Plan, there are two (2) Landform Conservation Areas, namely Category 1 and Category 2. The Plan specifies that an application for site development or alternation to lands in Category 1 shall identify planning, design and construction practices that will keep disturbance to landform character to a minimum, including:

- Maintaining significant landform features such as steep slopes, kames, kettles, ravines and ridges in their undisturbed form;
- Limiting the portion of new developable area of the site that is disturbed to not more than 25% of the total area of the site; and
- Limiting the portion of new developable area of the site that has impervious surfaces to not more than 15% of the total area of the site.

Similarly, an application for site development or alternation to lands in Category 2 shall identify planning, design and construction practices that will keep disturbance to landform character to a minimum, including:

- Maintaining significant landform features such as steep slopes, kames, kettles, ravines and ridges in their undisturbed form;
- Limiting the portion of new developable area of the site that is disturbed to not more than 50% of the total area of the site; and
- Limiting the portion of new developable area of the site that has impervious surfaces to not more than 20% of the total area of the site.

Sites considered for the Bloomington Road GO station, the Bloomington Road layover facility and the majority of the Aurora Road layover facility are situated within Landform Conservation Area Category 2 (MMAH, 2002).

Greenbelt Plan

In February 2004, the Province passed legislation under the *Greenbelt Protection Act* (Bill 135) which established a Greenbelt Plan for the GTA and Golden Horseshoe. The Greenbelt Plan incorporates the Oak Ridges Moraine and Niagara Escarpment Plan areas, plus an additional 1.8 million acres as a permanent area of countryside, which will be protected from urban sprawl and development.

The intended outcome of the Greenbelt Plan is to encourage compact urban planning within the Golden Horseshoe. The Greenbelt Plan acts to protect against the loss and fragmentation of the agricultural land base and supports agriculture as the predominant land use. The Plan provides protection to the natural heritage and water resource systems that sustain ecological and human health and that form the environmental framework around which major urbanization in south-central Ontario will be organized. In addition, the Plan provides a wide range of economic and social activities associated with rural communities, agriculture, tourism, recreation and resource uses (MMAH (2), 2009).

The Greenbelt Plan incorporates the areas of the Oak Ridges Moraine within the Study Area Corridor. Review of Section 2.1 of the Greenbelt Plan identifies that the policies outlined in the *Oak Ridges Moraine Conservation Plan* continue to apply. Areas of Protected Countryside within the Greenbelt Plan do not apply within the areas outlined in the *Oak Ridges Moraine Conservation Plan* with the exception of Section 3.3 of the Greenbelt Plan, which discusses Parkland, Open Space and Trails (MMAH (2), 2005).

Most of the GO Transit sites are situated within the Oak Ridges Moraine and thus must abide by the policies identified in the *Oak Ridges Moraine Conservation Plan*. A portion of the Aurora Road layover site and the entire Aurora Road GO station site is identified in the Greenbelt Plan as 'Protected Countryside' within a 'Natural Heritage System'. Lands within the 'Protected Countryside' designation are subject to the Greenbelt Plan, including the Natural Heritage System Policies (MMAH (2), 2005).

3.2.5 First Nation Interests

As part of this study, Indian and Northern Affairs Canada, the Ministry of Aboriginal Affairs and the Ministry of Attorney General were contacted to confirm First Nation interests. Information received from the Ministry of Aboriginal Affairs indicates that there are no existing or asserted First Nation rights that could be impacted by this study. Information received from Indian and Northern Affairs Canada identified that several claims have been submitted within the vicinity of the Study Area Corridor by the First Nations listed below. As a result, the following First Nations were contacted as part of this study.

- | | |
|---|---|
| • Alderville First Nation | • Mississaugas of the New Credit First Nation |
| • Beausoleil First Nation | • Chippewas of Georgina Island |
| • Chippewas of Mnjikaning First Nation (Rama) | • Mississaugas of Scugog Island First Nation |
| • Curve Lake First Nation | • Hiawatha First Nation |

3.2.6 Property Waste and Contamination

Review of the Ministry of Environment and Energy *Waste Disposal Site Inventory* (1991) indicates that although there are no active waste disposal sites within the Study Area Corridor, there are three (3) closed waste disposal sites in proximity to the CNR line. One (1) is located within the Town of Richmond Hill and two (2) are located in the Town of Whitchurch-Stouffville (MOEE, 1991):

- Closed waste disposal *Site No. X 7006* – Located north of Major Mackenzie Drive, approximately 450 m on the west side of the CNR line. It is noted that this landfill site was closed in the year 1955 and was classified as an A5 site. By definition, this site was once hazardous to humans and consisted of urban municipal/domestic wastes.

- Closed waste disposal *Site No. X 7005* – Located on the north side of Vandorf Sideroad immediately adjacent to the Vandorf GO station site, on the east side. It is noted that this landfill site was closed in the year 1960 and was classified as an A5 site. By definition, this site was once hazardous to humans and consisted of urban municipal/domestic wastes.
- Closed waste disposal *Site No. X 7003* – Located at the northern limits of study, south of Aurora Road on the west side of Ram Forest Road, approximately 500 m from the west side of the CNR line. Although the closure date is not known, this site was classified as an A3 site. By definition, this site was once hazardous to humans and consisted of urban municipal/domestic wastes.

The presence of potential sources of contamination within the Study Area Corridor was assessed based on site reconnaissance activities and aerial photography interpretation undertaken by the AECOM Consultant Team. As a result of these activities, no obvious sources of contamination were identified (e.g., above-ground storage tanks). However, several potential sources of contamination were identified:

- The existing CN corridor due to possible spills and/or leaks of oils, metals, arsenic, solvents and other petroleum products (e.g., fuels, lubricants) from moving freight and/or rail equipment.
- The Stouffville Road GO station site may include hydrocarbons (i.e., gasoline, diesel fuel, and fuel oils) or pesticide use as a result of parked vehicles over the gravel parking lot adjacent to the Golden Ridge Driving Course and agricultural fields.
- The Bethesda Sideroad layover site as a result of apparent dumping within the existing access road to the south of Bethesda Sideroad as well as within and adjacent to Berczy Creek on either side of the Bethesda Sideroad crossing.
- Existing commercial/industrial establishments located on the west side of the rail line on either side of Ram Forest Road. Aerial photography as well as site reconnaissance activities have identified tributaries of Weslie Creek traversing several commercial/industrial properties.

Based on the above sources, contaminants that may be present within proximity to the rail line corridor as well as the sites include hydrocarbons (i.e., gasoline, diesel fuel, and fuel oils), fuel additives, among others.

3.2.7 Emergency Service Providers

Emergency services within and adjacent to the Study Area Corridor include police, fire and ambulance. The Regional Municipality of York is protected by York Regional Police Services, which provides police services to Regional residents through five (5) different Districts. District 2 serves the Town of Richmond Hill, District 1 serves the Town of Aurora and District 5 serves the southern portion of the Town of Whitchurch-Stouffville (York Regional Police, 2009).

Fire services within the Study Area Corridor are provided by municipal fire departments. Emergency Medical Services (EMS) (including ambulance) are provided by the Region, which currently employs approximately 310 paramedics and deploys up to 24 ambulances and six (6) Paramedic Response Vehicles from 18 Paramedic Response Stations strategically located throughout the Region of York.

3.2.8 Utilities

The following utility companies were contacted throughout the study: Ontario Hydro, Rogers Cable, Bell Canada, Enbridge and Hydro One. Given the number of alternatives sites within this EA, utility companies will be further consulted during the Detail Design stage to determine the exact conflicts and plant relocation requirements.

3.2.9 Municipal Noise By-Laws

As the Study Area Corridor is situated within three (3) lower-tier municipalities, the construction of the GO stations and layover facility shall abide by local Noise By-Laws. These include the Town of Richmond Hill's Noise By-Law (Chapter 1055 of the Town of Richmond Hill's Municipal Code), the Town of Aurora (By-Law 4787-06.P) and the Town of Whitchurch-Stouffville (By-Law 90-92).

3.2.10 Navigable Waterways

Based on correspondence received from Mr. T. Markus, Navigable Waters Protection Officer at Transport Canada – Marine Safety dated May 25, 2009, the waterways are considered non-navigable at the proposed station/layover locations. Thus, there is no requirement for an application pursuant to the *Navigable Waters Protection Act* for this project.

3.3 Transportation

3.3.1 Rail Infrastructure

GO Transit is the inter-regional transit authority that provides commuter bus and rail service within and outside the GTA. GO Transit has a contract with CN to operate a regular commuter rail service using the CN Bala Subdivision between Richmond Hill and downtown Toronto (Fenco MacLaren, 1993). The Richmond Hill line runs adjacent to the Bradford and Stouffville GO transit lines, which all serve areas north of Toronto between Yonge Street and Highway 404.

At present, GO Transit rail service extends 21 miles from the Toronto Union station to the Richmond Hill GO Transit station. This extension operates as a multi-track service for 1.5 miles, as a double-track service for 2.5 miles (from Doncaster to Elgin), and as a single track service for the remaining 17 miles. There are five (5) GO Transit stations along this extension, namely Union, Oriole, Old Cummer, Langstaff and Richmond Hill. The Richmond Hill GO station is located along the CN route just north of Major Mackenzie Drive. At the Richmond Hill station, there is a 4,500 ft GO staging track platform on the east side of the CN Bala Subdivision.

3.3.2 Roads Infrastructure

Within the Study Area Corridor, the rail line crosses eight (8) major arterial roads under regional jurisdiction (i.e. Major Mackenzie Drive, Elgin Mills Road, Bayview Avenue, 19th Avenue west of Leslie Street, Leslie Street, Stouffville Road, Bloomington Road and Aurora Road). Additionally, the rail line traverses several municipal roadways including Centre Street, Crosby Avenue, and Bethesda Sideroad under the jurisdiction of the Town of

Richmond Hill; and, Vandorf Sideroad and Slaters Road under the jurisdiction of the Town of Whitchurch-Stouffville. Beyond the Corridor, the Town of Richmond Hill's road network provides direct access to major transportation routes such as Highways 7, 404 and 407.

Not all of the above listed roadway crossings are at grade with the CN Bala Subdivision. Within the Town of Richmond Hill, the rail line crosses over Major Mackenzie Drive, Bayview Avenue, Stouffville Road and Bloomington Road. The rail line is thus at grade with Centre Street, Crosby Avenue, Elgin Mills, 19th Avenue, Leslie Street and Bethesda Sideroad. However, the Region is currently considering a grade separation along the rail line at 19th Avenue.

3.3.3 Transit Network

Bus services within the Study Area Corridor are provided by Viva, York Region Transit, and GO Transit. These bus systems provide service within the three (3) area municipalities as well as access to other areas of York Region and Toronto.

3.4 Cultural Environment

The Study Area Corridor has a lengthy history of human settlement. As noted above, a large portion of the corridor traverses the Rouge River Watershed as well as the East Holland Subwatershed. The Rouge River Watershed has a lengthy history of human occupation that dates back more than 10,000 years. Early native inhabitants during the Paleo-Indian, Archaic, and Initial Woodland periods were primarily hunters. With the introduction of maize in Southern Ontario (circa AD 700), the population in the watershed increased substantially and led to the establishment of permanent villages associated with the Late Woodland period (TRCA, 2007).

European settlers arrived in the Rouge River Watershed during the 18th Century. The first European settlers were German-speaking farmers. By 1861, the watershed had 17 recognized villages and 54 saw mills. Mennonite farmers settled in the northern and eastern parts of the watershed. Recreational uses on lands that are now represented by Rouge Park began in Victorian times. The river valleys and countryside south of Highway 2 were used as cottage country until the 1950s.

The East Holland River Subwatershed has been inhabited by humans following the retreat of the Wisconsin Glacier more than 3,500 years ago. Such habitats included nomadic hunters, the Laurentian Indians and the Woodland Indians. The Iroquois occupied this area before the establishment of the Europeans, which occurred in 1615 with the arrival of Etienne Brûlé as part of Champlain's campaign against the Iroquois.

As part of the ongoing settlement patterns within the Subwatershed, including the establishment of Yonge Street as a major connecting link from Lake Ontario to Lake Huron, the landscape transformation from forest to farmland from 1853, the industrialization in the early 1900's and a trend towards urbanization, population within the East Holland River Subwatershed in 1921 was approximately 10,000. The population escalated to approximately 55,000 by the year 1981 (LSRCA, 2000).

Due to the range of historic land uses, it is probable that the Study Area Corridor contains some sites of archaeological and heritage significance. The *Ontario Heritage Act* provides for the conservation of Ontario's cultural heritage resources and regulates archaeological field activities through licensing. In recognition of the

essentially timeless quality of "things of the past", consideration must be given to the assessment of potential impacts on the cultural environment prior to commencement of a proposed undertaking.

3.4.1 Archaeological Resources

Given that potable water is an important resource for any extended human occupation or settlement, undisturbed areas within 150 m of a water body are normally considered to have high archaeological potential. In addition, agricultural lands have a high potential for locating archaeological remains due to past settlement activity on these lands. Within the Study Area Corridor, there are at least six (6) registered First Nations and/or Euro-Canadian archaeological sites in proximity to the rail line and associated watercourses. These are noted within **Table 8** (Fenco MacLaren, 1993).

Table 8. Registered Archaeological Resource Sites within the Study Area Corridor

Borden Number	Site Name	Cultural Affiliation	General Location
AlGu-10	N/A	N/A	West side of rail line, south of 19 th Avenue
AlGu-79	Reuben Heise	Late Iroquoian Village Findspot	North of Stouffville Road, east of rail line and woodlot/wetland
AlGu-89	Baker	Euro-Canadian Mid-Nineteenth Century	Approximately 600 m northeast of the Reuben Heise site. It is noted that the site consists of scattered artifacts over approximately 6,000 m ²
AlGu-65	Shark Site	Euro-Canadian Nineteenth Century	South of Bethesda Sideroad, east of Leslie Street on the west side of the rail line.
AlGu-63	Scorpio I	Undetermined Prehistoric	South of Bethesda Sideroad, immediately west of Highway 404 on the east side of Berczy Creek.
AlGu-64	Scorpio II	Undetermined Prehistoric	South of Bethesda Sideroad, immediately west of Highway 404 on the east side of Berczy Creek

Note: None of the GO facility sites are situated directly within the above mentioned registered archaeological sites.

In August, 1992, Archaeological Services Inc. conducted a Stage 2 Archaeological Assessment for the Richmond Hill GO Transit rail service expansion Environmental Assessment Study. As noted therein, those lands within the Stouffville Road GO station, the Bethesda Sideroad layover site, the Bloomington Road GO station and the Bloomington Road layover sites were assessed for archaeological potential. Details regarding the archaeological potential for the original footprint of these sites are outlined below.

Stouffville Road – GO station site

The area within and adjacent to this site consists of open fields crossed by a wooded swale. It is noted that the open field south of the wooden swale, which is now predominately a corn field was found to be completely devoid of topsoil and thus not considered as high archaeological concern. Moreover, the open field north of the wooden swale was not ploughed at the time of assessment. Given the sites adjacency to the above mentioned registered Reuben Heise (AlGu-79) site, it was recommended that the site be ploughed and assessed by pedestrian survey.

A portion of the level areas within the wooded swale were test-pitted at 5 m intervals and processed through a 6 mm mesh for approximately 35 different test sites with a topsoil depth ranging from 20 cm to 30 cm. It was concluded that no significant cultural material was recovered from this area.

Bethesda Sideroad – Layover site

Site # 4 within the previous GO EA Study represents those lands similar to the Bethesda Sideroad layover facility. As noted within the Archaeological Assessment, it was determined that although the area exclusively consists of cultivated fields, a tributary of the Rouge River potentially crosses one (1) section of the Bethesda Sideroad footprint. Thus, it was determined that this site be considered high archaeological potential and recommended that it be ploughed prior to a pedestrian walking survey (Fenco MacLaren, 1993).

Bloomington Road – GO station site

The Bloomington Road GO station consists primarily of idle scrub within open lands. It was noted in the EA Study that the southern portion of the site appeared to be poorly drained and that the site is highly disturbed due to the adjacent Highway 404 interchange. Since the area was not ploughed at the time of the assessment, it was recommended that the site be ploughed and assessed by pedestrian survey prior to construction (Fenco MacLaren, 1993).

Bloomington Road – Layover site

This site is situated within forested/wetland areas. It was noted during the Archaeological Assessment Study that the area contains both poorly drained and moderately well drained soils. Due to the site's proximity to a tributary of the Rouge River, it was recommended that the site be assessed by the excavation of test pits. It is further noted that this site is considered as having a high potential of archaeological resources in the moderately well drained locations (Fenco MacLaren, 1993).

Vandorf Sideroad – GO station site, Aurora Road – Layover and GO station sites

The previous GO Transit EA Study did not assess these lands. Based on review of the East Holland River Subwatershed Study and the existing land uses of the sites, as well as their proximity to significant watercourses, these sites may also have a high potential for archaeological resources.

3.4.2 Built Heritage Resources

Review of the Rouge River Management Plan indicates that the Rouge River watershed consists of more than 1400 known archaeological and heritage sites. About 42 heritage structures are protected under the *Ontario Heritage Act*. There are at least 13 built heritage features within the Study Area Corridor: two (2) industrial/commercial sites, two (2) structural sites, seven (7) residential sites, and two (2) farm complexes (Fenco MacLaren, 1993). There is concern that the area's architectural features associated with farm buildings will decline, along with the loss of their landscape.

In addition to the above, it is noted that the entire Community of Gormley, located south of Stouffville Road, on the east side of Leslie Street is being declared as a Heritage Conservation District. The area is characterized as a rural neighbourhood with a collection of mainly early 20th Century houses, a high percentage of which are heritage

buildings. Although none of the GO Transit sites are directly within a place of built heritage, one (1) heritage home may be directly impacted and will require relocation if the Stouffville Road GO station expands its parking facilities. The site is currently located at #12471 Leslie Street (circa 1882) and is currently derelict.

Although site reconnaissance activities did not identify built heritage resources within the vicinity of the Bloomington Road and Aurora Road sites, concrete silos were observed on the north side of Vandorf Sideroad, east of the rail line and on the west side of the Vandorf GO station site. These silos were observed to be in very bad shape, with noticeable cracking and concrete pieces missing from the top.

4. Concept Alternatives

4.1 Description of Concept Alternatives

Concept alternatives represent alternate ways to solve the problem and address general needs for the project. These alternatives are evaluated based on how efficiently and effectively they solve the existing operational deficiencies with GO services along the Richmond Hill line. A detailed problem statement, including several issues with GO rail services along this line is described in **Section 2.1** of this ESR. The issues identified in **Section 2.1** are organized by existing GO Transit layover and Train Station operations along the CN Bala Subdivision line. The range of alternatives considered at this stage is as follows:

- Do nothing, that is continue to deadhead existing trains to the Willowbrook Facility in Mimico for overnight storage, without building a new facility;
- Store additional trains at an existing GO Transit rail station within the Richmond Hill Corridor, with no expansion to the existing facility;
- Expand an existing GO Transit rail storage facility to accommodate additional trains for storage; and
- Develop a new location and build new facilities within the Study Area Corridor for train storage and passenger (station) access.

4.2 Assessment of Net Effects of Preliminary Concept Alternatives

As noted in **Table 9**, concept alternatives were compared with the ‘Do Nothing’ approach. The ‘Do Nothing’ approach is defined as no improvements where no changes would be made to solve the identified problem statement outlined in **Section 2.1**. This approach is often considered during an EA to determine whether the costs, both financial and environmental, significantly outweigh the benefits of the project. In addition to the ‘Do Nothing’ approach, three (3) other alternatives were considered and evaluated based on their opportunities/constraints in solving the ongoing issues along the Richmond Hill line. In identifying the opportunities/constraints for each alternative, the Project Team considered factors such as the problem statement, environmental impacts, future growth projections, the economy, and government initiatives (i.e., *Move Ontario 2020*). In addition to this, the concept alternatives were chosen and evaluated in consideration of public and agency input. Details regarding public and agency input are further outlined in **Section 4.4**. This analysis was reviewed in the context of extending the Study Area and is relevant to the corridor from Major Mackenzie Drive up to Aurora Road.

Table 9. Assessment of Concept Alternatives

Concept Alternative	Opportunities/Constraints	Recommendation
Do Nothing, that is continue to deadhead existing trains to the Willowbrook Facility in Mimico for overnight storage, without building a new facility	<ul style="list-style-type: none">• No additional unallocated storage capacity is available at existing GO Transit rail stations within the Richmond Hill Corridor.• Improvements to commuter rail services are limited without additional trains.• Costs to deadhead trains will increase significantly as a result of additional trains	Do nothing does not address the opportunity of providing sufficient storage facilities to enhance services within the Richmond Hill Corridor and beyond. As a result, Alternative (1) has been screened from further

Concept Alternative	Opportunities/Constraints	Recommendation
	<p>and limited storage space. Track time is compromised due to a lack of availability.</p> <ul style="list-style-type: none">• Is not within mandate to the Regional Municipality of York’s Transportation Master Plan or the MoveOntario 2020 initiative, which includes building a modern transit system that moves people and goods quickly.• Greater environmental impacts due to train deadheading. Additional air quality impacts are a likely result.	analysis.
Store additional trains at an existing GO Transit rail station within the Richmond Hill Corridor, with no expansion to the existing facility	<ul style="list-style-type: none">• Existing storage sites would continue to be utilized.• No additional unallocated storage capacity is available at existing GO Transit rail stations or yards within (or near) the Richmond Hill Corridor.• Costs to deadhead trains will continue to increase as a result of additional trains and limited storage space. Track time is compromised due to a lack of availability.• May solve some environmental impacts, however does not encourage a connected transit system within the Region.	Storage at existing facilities does not address the opportunity of providing sufficient storage space to enhance services within the Richmond Hill Corridor and beyond. Existing facilities such as Oshawa, Barrie, Milton, Hamilton, and Don Yard are and have been expanded to serve expansion on these corridors. As a result, Alternative (2) has been screened from further analysis.
Expand an existing GO Transit rail storage facility to accommodate additional trains for storage	<ul style="list-style-type: none">• Existing storage sites would continue to be utilized.• Capacity available at existing GO Transit rail stations within the Corridor is limited. Currently, Willowbrook, Bathurst Yard, and Don Yard storage facilities have been expanded to maximum capacity. As these facilities are located within an urbanized setting, future expansion would be very difficult from a socio-economic perspective and costly to carry out.• Problems associated with deadhead trains will remain.• Expansion involves major redesign of the existing facility(ies) with impacts to extend beyond the existing footprint.• Greater environmental impacts due to train deadheading. Additional air quality impacts are a likely result.	Expanding an existing facility to provide additional storage space is not feasible given the constraints. As a result, Alternative (3) has been screened from further analysis.

Concept Alternative	Opportunities/Constraints	Recommendation
Develop a new location and build new facilities within the Study Area Corridor for train storage and passenger (station) access.	<ul style="list-style-type: none">• New GO train station would be located in an area of high demand for enhanced commuter rail service.• Present and future storage needs would be accommodated by a new layover facility.• Costs for all existing scheduled deadhead trains will be eliminated as a result of sufficient storage space available at a new location.• Potential impacts would need to be assessed.	Developing a new storage facility is an option to provide additional storage space in support of enhanced services within the Richmond Hill Corridor and beyond. If Alternative (4) cannot be implemented, expansion of service to Richmond Hill appears unlikely. As a result, Alternative (4) is considered for further analysis.

4.3 Evaluation of Preliminary Concept Alternatives

Based on the above evaluation, the following concept alternative has been carried forward:

Develop a new location and build facilities within the Study Area Corridor for train storage and passenger (station access).

Characteristics of a Layover Storage Facility

Trains arrive at the Layover Facility and are plugged into power supply for overnight storage. The yard is simply a parking area for the trains with the following restrictions:

- No major maintenance activities permitted
- No fueling of trains permitted
- No shunting to occur
- No breaking or coupling of trains to occur.

However, the following activities may occur:

- Minor maintenance limited to such activities as replacement of broken windows. All major repairs and lubrication of trains to continue to occur at the Willowbrook Yard in Mimico.
- Cleaning train interiors of accumulated refuse, such as coffee cups and newspapers.

Based on current schedules, the last train would arrive at the yard by 7:30 pm and shut down by 8:00 pm. In the morning, all trains would start up approximately one (1) hour before their service begins (e.g., between 5:00 am and 5:30 am).

Characteristics of a GO Train Station

GO Stations feature one or more platforms, each the length of a GO train, for passengers to embark or disembark trains. Platforms have shelters and security lighting on short, 20-foot poles. Platforms also have a raised mini-platform to permit barrier-free access to trains.

Most Stations have a parking lot, with between 300 to 1500 spaces, and a “Kiss & Ride” for passenger drop off. Many have bus loops for use by GO Transit or other (municipal) buses. These areas are illuminated during train service hours, and may have low-level security lighting after hours. Most Stations have a small station building, with washrooms and a ticket booth. Multi-platform stations may feature tunnels to access platforms, with stairs and elevators.

Project Benefits

Through improved mobility, safety, security, economic opportunity and environmental quality, public transportation benefits individuals, families, businesses, industries and communities. Some of the primary project benefits are:

Improved access to GO Trains – despite growth, there is nearly 20% unused capacity in the Richmond Hill Corridor. An additional GO Transit station to the north will enable potential riders to conveniently access this unused capacity.

Reduced gridlock – this project will take cars off the roads. Existing GO Transit riders living north of Richmond Hill will be able to exit off Highway 404 before reaching Major Mackenzie Drive. Attracting new GO Transit riders will reduce the load on roadways south of Stouffville Road/Major Mackenzie Drive.

Increased train service – this project is the critical first step to enable subsequent GO Transit enhancements such as 12 car trains (providing a 20% capacity increase), and additional trains. Construction/operation of the proposed layover facility will eliminate deadheading, freeing track time, and improve GO Transit’s position to negotiate for additional trains with CN.

A cleaner environment – eliminating “deadhead” moves of empty trains will reduce train emissions. The subsequent increase in train service will reduce emissions from road vehicles, in turn reducing smog and the emission of greenhouse gases.

Reliability of train service – switch, signal and similar problems at Willowbrook or Union Station can currently prevent empty trains from reaching Richmond Hill. Storing trains at the north end of the Richmond Hill Corridor will eliminate this risk.

Job creation – this project will create jobs in the community.

4.4 Public and Agency Consultation

During the concept alternative stage of the EA (Stage 2), formal contact was made with the public and regulatory agencies in the form of a Public Information Centre (PIC) to present the project background, the environmental assessment process and the preliminary evaluation of the alternatives. In anticipation of the first PIC, meetings were held with the following regulatory agencies:

Meeting with the Town of Richmond Hill

A meeting was held with the Town of Richmond Hill Gridlock Task Force on June 20, 2007. The Gridlock Task Force is a committee of Town Council. The purpose of this meeting was to present the project and answer

questions regarding the study. The Project Team introduced the project by providing background to a number of studies that have been completed in support of expanding GO Transit rail services within the Richmond Hill Corridor. Increased population and ridership has provided the impetus to move ahead with expansion in the Corridor.

To this end, UMA Engineering Ltd. (now AECOM) was retained by GO Transit to carry out an EA and Preliminary Design Study for a new Richmond Hill Train Station and Layover Facility. At the time of this meeting, a combined train station and layover facility was considered to cover an area of approximately 15 ha (10 ha for the station and 5 ha for the layover). CN owns the rail tracks within the Corridor and has an agreement with GO Transit to use the tracks. The Project Team explained the need for CN to add an additional track up to Stouffville Road (referred to as ‘twinning’ the tracks). Presently, the rail line does not provide all day two-way traffic. Twinning the tracks would provide an opportunity to increase service within the Corridor. GO Transit is looking to increase service along this Corridor to six morning and evening trains.

Prior to the meeting, the Project Team invited a wide range of government agencies and placed notices in the applicable newspapers to invite the public to attend the first Public Information Centre (PIC) on June 26, 2007. The PIC display materials were presented to the committee. In response to questions, the Project Team explained that no existing facility within the Corridor can store 12-car trains. As well, it is not feasible to park trains on a dual track. In the end, the Town noted that the project presents long-term benefits and not necessarily an immediate benefit to Richmond Hill. The Project Team explained that the new train station will be a benefit as it will increase ridership from nearby municipalities.

Meeting with York Region

A meeting was held with the Regional Municipality of York during Stage 2 of the study. The purpose of this meeting was to present the project and answer questions regarding the study. The Region suggested that the Project Team consider extending the Study Area to north of Bloomington Sideroad, which would provide an opportunity to coordinate with recommendations of the regional transportation master plan. The Region noted that a new VIVA bus station is proposed at Jefferson Sideroad and Yonge Street. In addition, the Region highlighted the importance of planning factors such as compatibility with the surrounding land uses and conformity with the Oak Ridges Moraine Plan to the extent possible. The Gormely West Secondary Plan is proposed on the west side of Leslie Street and industrial development is proposed on the east side of Gormely Road. The Region recommended that the Project Team assess the 2031 horizon when determining the need for future expansion.

Public Information Centre No. 1

GO Transit held a PIC on June 26, 2007, to present and receive public/agency input on feasible concept alternatives for the proposed layover facility and train stations within the Study Area Corridor. At the time, the Study Area Corridor extended from 500 m south of Major Mackenzie Drive to north of Bethesda Sideroad in the Town of Richmond Hill. The PIC was held at the Town of Richmond Hill Municipal Offices located at 225 East Beaver Creek Road, Committee Room 1, 1st floor, between 6:00 pm and 9:00 pm.

A notice inviting the public to attend the PIC was published in the *Richmond Hill/Thornhill Liberal* on Thursday May 31st, 2007. In addition, notification letters were mailed to regulatory agencies listed in **Table 1**. All public and agency correspondence is included in **Appendix A**. Participants were invited to drop in at the Municipal Offices between 6:00 pm and 9:00 pm to view display boards containing information about the project and to

speak one-on-one with representatives from the Project Team. The following display boards were presented at the PIC:

- Welcome to Public Information Centre No. 1
 - What is GO Transit
 - Background to the Study
 - Purpose of the Study
 - Study Area Corridor
 - Group B Class EA Process
 - Existing Corridor Conditions (Aerial Photo)
 - Existing Corridor Conditions – Natural Environment
 - Existing Corridor Conditions – Natural Environment (Continued)
 - Existing Corridor Conditions – Socio-Economic and Cultural Environment
 - Existing Corridor Conditions – Transportation Environment
- Problems and Issues to Address
 - Concept Alternatives
 - Concept Alternative (1) – Do Nothing
 - Concept Alternative (2) – Store Additional Trains at an Existing Station
 - Concept Alternative (3) – Expand an Existing Storage Facility
 - Concept Alternative (4) – Develop a New Storage Facility at a New Location
 - Characteristics of a New Storage Facility
 - Characteristics of a GO Train Station
 - Project Benefits
 - Next Steps
 - Remain Involved in the Study

A PIC Brochure was distributed to participants summarizing the content of the display materials and outlining future Class EA activities to be carried out. A copy of the display materials and brochure is included in **Appendix A**. Participants were encouraged to fill in and submit a questionnaire to gauge feedback on the project. Written comments could be submitted during the PIC or emailed/faxed/mailed to members of the Project Team by July 20, 2007.

Representatives from GO Transit and AECOM were present at the PIC to provide information, answer questions, and receive comments from participants. The following representatives were in attendance:

- GO Transit:

- Mr. George Atikian, Senior Project Officer
 - Mr. Rick Howe, Project Coordinator
 - Mr. Eric Eisen, Senior Project Engineer
- UMA:

- Mr. Bill Hjelholt, Consultant Project Manager
 - Mr. Andrew Ritchie, Lead Environmental Planner
 - Ms. Sonya Kapusin, Environmental Planner

Thirty-one people signed in at the PIC. This attendance record is in addition to the number of representatives attending from GO Transit and AECOM. Participants included councillors, members of advocate groups and associations, nearby residents, and home builders.

Three questionnaires were submitted during the PIC by residents and/or property owners living near the Study Area Corridor. A summary of comments received at the PIC, and how they have been addressed, is provided in **Appendix A**. This summary has been prepared based on a review of questionnaires submitted by participants during the PIC, as well as issues/concerns recorded following one-on-one discussions with individual attendees.

Overall, many participants agreed that improvements to the GO Transit rail service in Richmond Hill are required. Participants indicated that the land to the north of Stouffville Sideroad was a good location for a layover facility and train station as the area is currently comprised of open fields. The adjacent land to this site will be developed as part of the West Gormley Secondary Plan and would house a large population who would benefit from enhanced GO Transit services. Participants suggested that GO Transit coordinate its efforts with York Region Transit and VIVA to facilitate transit improvements throughout Richmond Hill and York Region as a whole.

Representatives from the Bayview Country Estates Ratepayers Association (BCERA), a community comprised of 60 memberships representing approximately 200 adults/voters and approximately 75% of the properties, attended the PIC and expressed their concerns with potential GO Transit facilities in the areas adjacent to 19th Avenue and the CNR line. Several concerns were raised on behalf of the community regarding potential nuisance impacts associated with the proposed layover facility/GO Train station. Specific mention was given to noise, dust, visual intrusion and light pollution. It was noted that GO should avoid the significant forested area (Jefferson Swamp) located directly southeast of the Bayview Country Estates and should attempt to locate the facility/ies to the northeast, near Stouffville Road.

Through one-on-one discussions, participants questioned why the Study Area Corridor did not extend further north to Bloomington Sideroad as this area had been considered in the past. Separate discussions between GO Transit and York Region indicated a need and an interest to provide services beyond Bethesda Sideroad. Shortly before the PIC, the MoveOntario 2020 initiative was announced by the Province of Ontario supporting the extension of the Richmond Hill Corridor to Aurora Road in Whitchurch-Stouffville. Based on comments received from the public and agencies, coupled with the opportunities introduced through the MoveOntario 2020 initiative, the northern limit of the Study Area Corridor was extended from north of Bethesda Sideroad to 500 m north of Aurora Road in the Town of Whitchurch-Stouffville.

5. Preliminary Design Alternatives

5.1 Identification and Description of Preliminary Design Alternatives

This section of the ESR will provide a detailed analysis of the seven (7) different preliminary design options considered as part of this study. As noted within **Section 4**, four (4) concept alternatives were considered in determining the most effective way to deal with the problem and issues that needed to be addressed along the Richmond Hill CN Bala Subdivision line. As noted therein, the recommended concept alternative includes developing a new storage facility at a new location while providing for additional passenger access through new GO stations to further expand rail services within the Regional Municipality of York. To a certain extent, all of the alternative designs address the problems outlined in **Section 2** of this report. However, given the sensitivity of the alternative sites from a natural, socio-economic, cultural and technical environmental perspective, some of the sites considered are better suited to address the problem as they represent less of an overall negative impact on the environment.

As the original Study Area Corridor extended from Major Mackenzie Drive to Bethesda Sideroad, the Regional Municipality of York suggested expanding the Study Area Corridor further north, as the Region's *Transportation Master Plan* (2002) identifies GO services to Bloomington Road. Additionally in 2007, the Ontario government announced a multi-year \$17.5 billion rapid transit action plan for the GTA and Hamilton that will build 902 km of new or improved rapid transit. Among 17 of the GO Transit Commuter Rail initiatives, the GO Richmond Hill rail line extension to Aurora Road was included as a means of moving people efficiently through York Region. As a result of the above suggestions/initiatives, the Study Area Corridor was extended to consider the need for GO facilities beyond the Town of Richmond Hill.

As a result of discussions with CN coupled with the current constraints of the CNR line (i.e., existing siding track north of Stouffville Road), it was determined that GO facilities should be situated on the east side of the CN Bala Subdivision. In addition, four (4) of the seven (7) above mentioned sites (Bethesda Sideroad and Bloomington Road layover facilities and Stouffville Road and Bloomington Road GO stations) were previously considered as part of the *Richmond Hill Environmental Assessment Study* (1993) prepared by Fenco MacLaren Inc.

The Project Team considered the potential for GO station locations south of Stouffville Road and north of the existing Richmond Hill GO Station at Major Mackenzie Drive. Suitable sites were limited within this portion of the corridor given the on-going residential/commercial development and the existing natural environmental sensitivities in the area.

Further to the 1993 EA Study, a GO station was considered within the northeast quadrant of Bayview Avenue and 19th Avenue, on the east side of the CNR line immediately south of the Life Science Jefferson Forest ANSI. This site was screened during the early stages of the EA as it was not considered feasible from an environmental and socio-economic perspective. The site is located within the Oak Ridges Moraine and within designated hazard lands. In addition, the site is situated adjacent to two (2) tributaries of the Rouge River and is directly within a portion of the Rouge River Flood Plain as per mapping received by the TRCA.

The intent of the 19th Avenue GO station would be to serve the residence in the local area. However, strong opposition for locating a station in this area was expressed at PIC No. 1 by the local residents, namely the

Bayview Country Estates Ratepayers Association (BCERA) representing the community. A future station at this location could be considered at a later date.

Based on the concept alternative of considering a new storage facility at a new location while providing for additional passenger services, details regarding the seven (7) preliminary design options within the Study Area Corridor from Major Mackenzie Drive to Aurora Road are outlined below. Each option is illustrated from **Figure 10 to Figure 14**.

Bethesda Sideroad – Layover site

The Bethesda Sideroad layover site is situated on the south side of Bethesda Sideroad, on the east side of the CNR line. An approximately 285 m access road will be designed on the existing unpaved private access road, which will take persons to the north side of the layover facility. The design layout of this facility will consist of six (6) yard tracks to store up to six (6) 12-car trains overnight, including a substation building located on the northern portion of the layover. A substation building is needed to house the electric power supply, while the adjacent wayside cabinet is where the trains will receive their electric power. This option includes an additional CN track leading to and from the layover facility. Bethesda Sideroad is at grade with the CNR line.

Bloomington Road – Layover site

The Bloomington Road layover site is situated on the north side of Bloomington Road, on the east side of the CNR line. Access to this site will be granted from an access road over Bloomington Road and via the Bloomington Road GO station. The access road will extend northerly approximately 200 m north of Bloomington Road to the layover site. As a result, the existing CNR line overpass bridge will need to be widened. The design layout of this facility will consist of six (6) yard tracks to store up to six (6) 12-car trains overnight, including a substation building located on the northern portion of the layover. A substation building is needed to house the electric power supply, while the adjacent wayside cabinet is where the trains will receive their electric power. This option includes an additional CN track leading to and from the layover site.

Aurora Road – Layover site

The Aurora Road layover site is situated on the south side of Aurora Road, on the east side of the CNR line. Access to this site will be granted from an access road off of Aurora Road, past the Aurora Road GO station site and will connect to the layover site. This access road would be approximately 800 m from Aurora Road. The design layout of this facility will consist of six (6) yard tracks to store up to six (6) 12-car trains overnight, including a substation building located in the northern portion of the layover site. A substation building is needed to house the electric power supply, while the adjacent wayside cabinet is where the trains will receive their electric power. This option includes an additional CN track leading to and from the layover facility. Aurora Road is at grade with the CNR line; however no GO trains would be required to cross Aurora Road.

Stouffville Road – GO station site

The Stouffville Road GO station site is located on the north side of Stouffville Road, on the east side of the CNR line. The station will consist of a station platform, building, bus loop, "Kiss & Ride", and up to 850 parking spaces (with opportunities for expansion). Access is provided from Stouffville Road, via an existing access road that currently services a seasonal recreational establishment. The access road leading to the site will connect to Gormley Road East, which is to be slightly realigned to the west and will include a signalized intersection. As this

option includes an additional CN track leading to and from the station, the CNR line will cross over Stouffville Road.

Bloomington Road – GO station site

The Bloomington Road GO station site is located on the south side of Bloomington Road, on the east side of the CNR line. The station will consist of a station platform, building, bus loop, “Kiss & Ride”, and up to 700 parking spaces (with opportunities for expansion and a car pool lot). A storm water management pond, which is approximately 700 m², will be constructed on the south side of the bus loop. Access is provided from Bloomington Road via a grade separation over the Highway 404 on-ramp, which will need to be relocated. This option includes an additional future CN track leading to and from the station. The proposed access road will require relocation of the Highway 404 west-south ramp for approximately 550 m.

Vandorf Sideroad – GO station site

The Vandorf Sideroad GO station site is located on the north side of Vandorf Sideroad, on the east side of the CNR line. The station will consist of a station platform, building, bus loop, “Kiss & Ride”, and up to 1,070 parking spaces (with opportunities for expansion). Access is provided from Vandorf Sideroad. This option includes an additional CN track leading to and from the station, which involves the construction of a new bridge over Vandorf Sideroad.

Aurora Road – GO station site

The Aurora Road GO station site is located on the north side of Aurora Road, on the east side of the CNR line. The station will consist of a station platform, building, bus loop, “Kiss & Ride”, and up to 760 parking spaces (with opportunities for expansion). Access is provided from Aurora Road via an approximately 310 m access road. This option includes an additional future CN track leading to and from the station.

5.2 Assessment of Net Effects of Preliminary Design Alternatives

The preliminary design alternatives (or sites) were evaluated using several criteria, including:

Natural Environment	Socio-Economic Environment
<ul style="list-style-type: none">• Impact on Water Resources• Impact on Fisheries Resources• Impact on Terrestrial Environment• Impact on Environmentally Sensitive Areas	<ul style="list-style-type: none">• Property Acquisition Requirements• Compatibility with Existing and Designated Land Uses• Permanent Noise and Visual Impacts• Business Impacts• Agricultural Impacts
Technical Requirements	Cultural Environment
<ul style="list-style-type: none">• Track Installation, including Alignment• Construction Cost• Operational and Maintenance Cost*• Construction Footprint, including Staging and Grading• Opportunities for Future Expansion of Parking Lot**	<ul style="list-style-type: none">• Impact on Built Heritage Features• Impact on Archaeological Resources

* Impact does not apply to GO stations.

** Impact does not apply to layover facilities.

The assessment of environmental effects was undertaken based on the footprint of each of the seven (7) sites, background information collected to describe the existing environment and public and agency comments. As noted within **Table 10** and **Table 11**, the assessment categorizes the impacts from ‘Low’ to ‘High’.

A ‘Low’ impact identifies an outcome that is similar to a ‘Do-Nothing’ approach. Alternatively, if an assessment is categorized as ‘High’, it will result in a greater negative impact.

Table 10 and Table 11 evaluate the ‘net effects’ in relation to the criteria listed above, as determined by the Project Team. By definition, net effects are those effects that will remain after all reasonable mitigation is employed. Moreover, mitigation measures are used in the planning and environmental assessment process to alleviate negative impacts to the proposed undertaking. A detailed list of mitigative measures, including environmental effects, permits and approvals and commitments to further investigations are detailed within **Section 6** of this document.

As noted in **Section 4**, the ‘Do-Nothing’ approach was screened from further consideration. Each layover site was evaluated in comparison to all other layover sites; while each GO Station site was evaluated in comparison to all other GO Station sites. The criteria used to evaluate the layover and GO Train station sites were weighed with equal importance. In other words, impacts to the socio-economic and cultural environment, as well as technical requirements are just as important as natural environmental impacts.



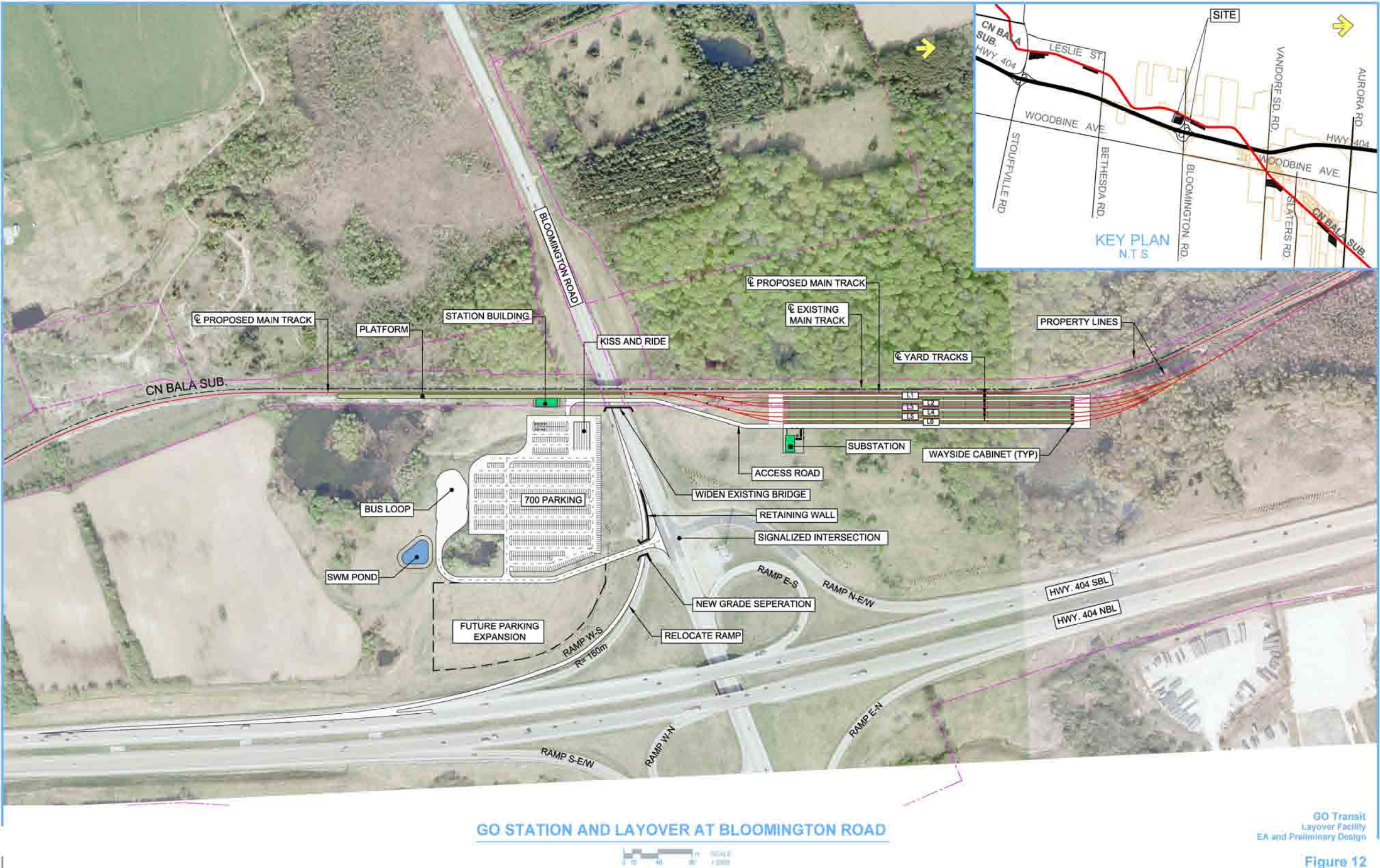
GO STATION AT STOUFFVILLE RD.

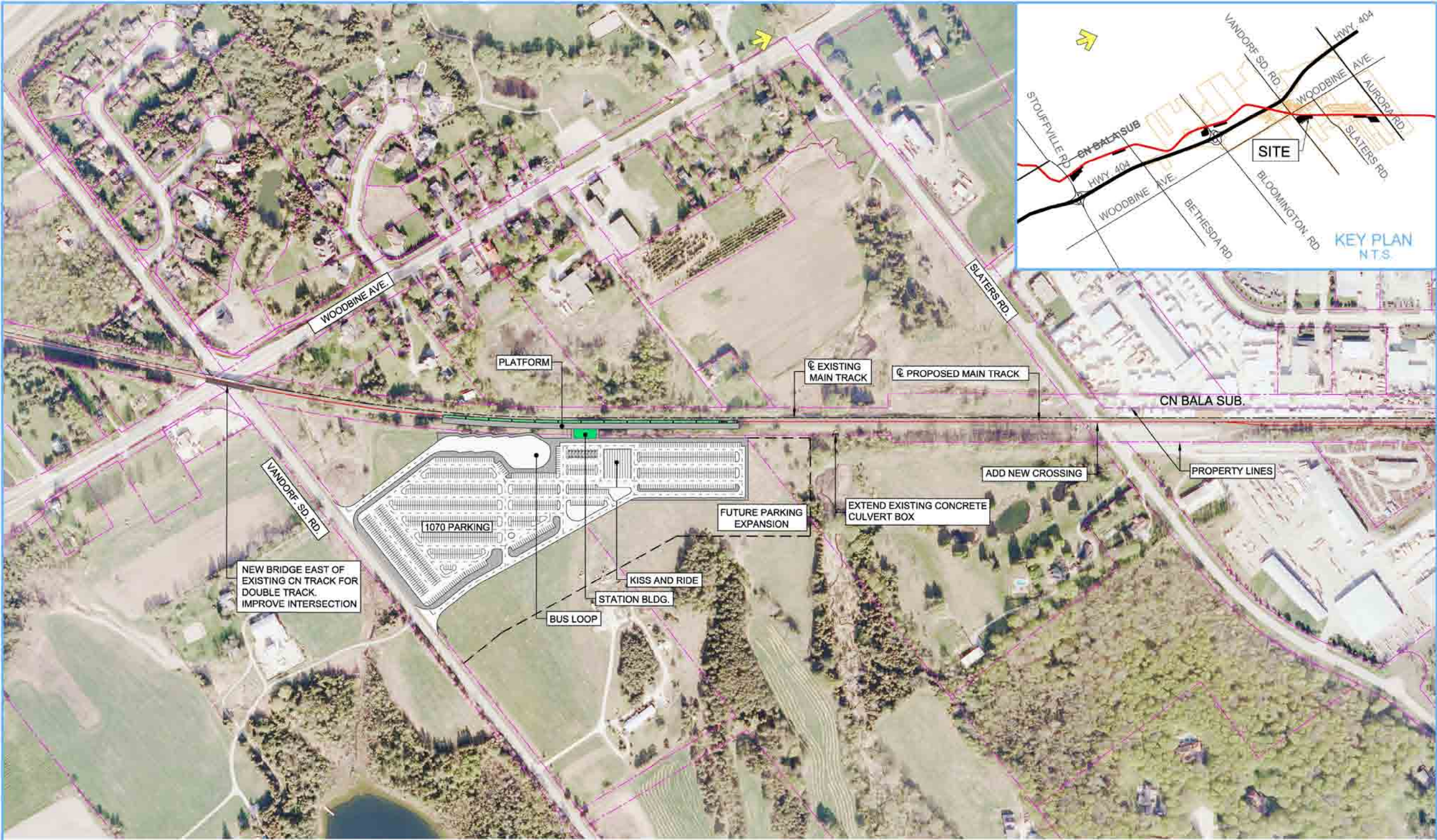
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GO Transit
Layover Facility
EA and Preliminary Design

Figure 10
GO Transit







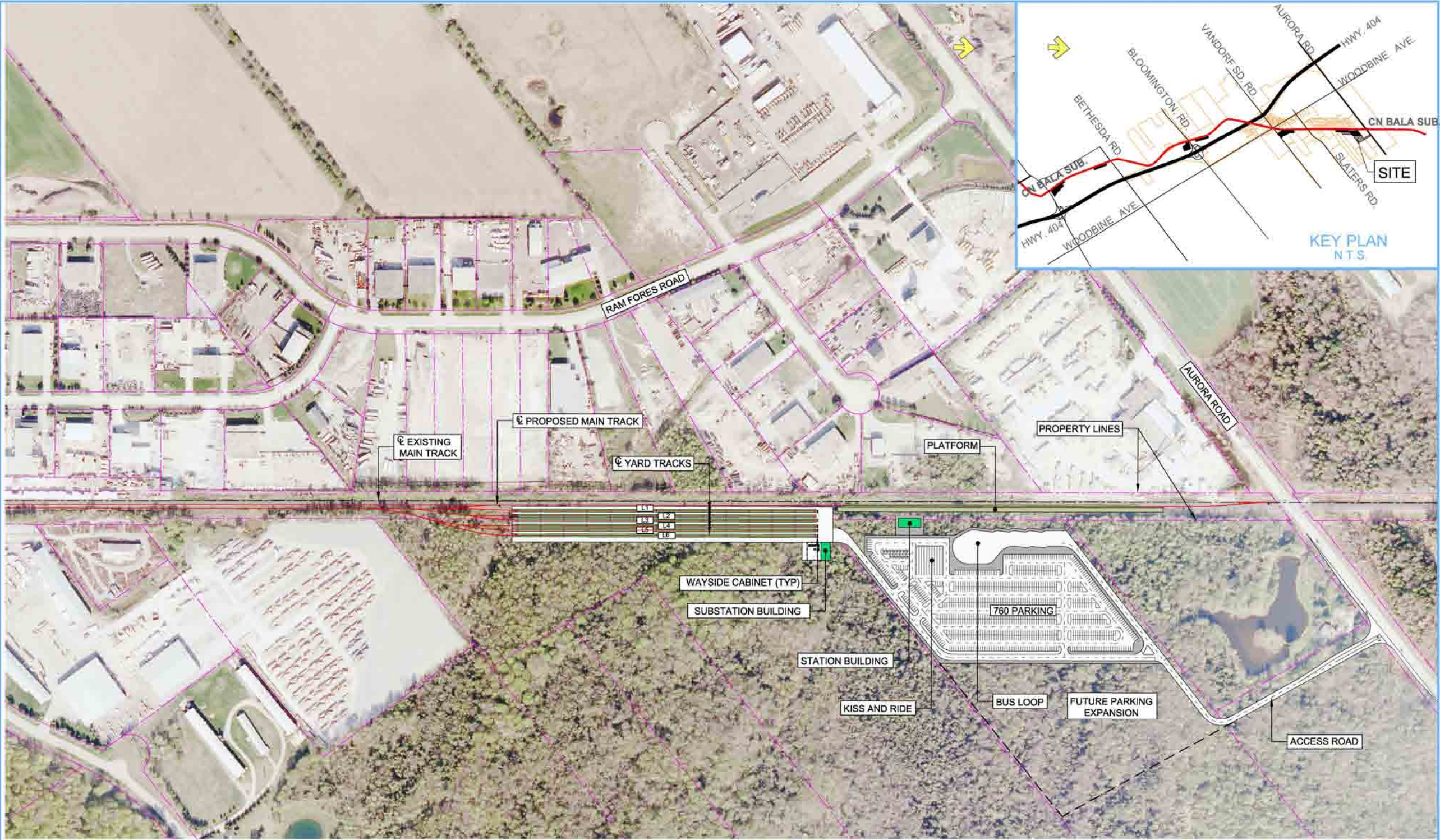
GO STATION AT VANDORF RD



AECOM

GO Transit
Layover Facility
EA and Preliminary Design

Figure 13
GO Transit



LAYOVER AND GO STATION AT AURORA RD



AECOM

GO Transit
Layover Facility
EA and Preliminary Design

Figure 14
GO Transit

Table 10. Assessment of Alternative Layover Facility Sites

EVALUATION CATEGORIES/CRITERIA	ALTERNATIVE LAYOVER FACILITY SITES		
	LAYOVER AT BETHESDA SIDEROAD (FIGURE 11)	LAYOVER AT BLOOMINGTON ROAD (FIGURE 12)	LAYOVER AT AURORA ROAD (FIGURE 14)
NATURAL ENVIRONMENT			
Impact on Water Resources (e.g., surface water and groundwater)	<p>Low to Moderate – Proposed Layover will directly affect approximately 70 m of a single line intermittent watercourse to Berczy Creek.</p> <p>The proposed access road to the Layover is situated within the Toronto and Region Conservation's (TRCA) Generic Regulation; however, a road currently exists over Berczy Creek. Such regulations are meant to be a hazard management tool to protect people and property from natural hazard processes including flooding (TRCA, 2008). Thus, a permit may be required for construction of placing fill in areas subject to flooding or erosion.</p> <p>The Layover footprint is not situated within any areas of high aquifer vulnerability. However, the future tracks leading into the layover to the west of the footprint traverse areas of high aquifer vulnerability.</p> <p>The access road to the proposed Layover facility is situated immediately adjacent to the Wilcox – St. George Wetland Complex.</p>	<p>High – Proposed Layover will not impact any watercourses.</p> <p>Approximately half of the proposed Layover facility is situated within the Toronto and Region Conservation's (TRCA) Generic Regulation. Such regulations are meant to be a hazard management tool to protect people and property from natural hazard processes including flooding. Thus, a permit is required for construction of placing fill in areas subject to flooding or erosion.</p> <p>The Layover footprint is not situated within areas of aquifer vulnerability, but will displace approximately 4,300 m² of a White – Rose Preston Lake Wetland Complex. It is also anticipated that the future yard tracks will impact a portion of a second wetland complex located immediately north of the Layover footprint.</p> <p>The proposed Layover traverses on approximately 16,500 m² of another wetland know as the Bloomington Wetlands.</p>	<p>High – The proposed Layover footprint is not situated within any watercourse features, however the yard track leading up to the Layover will traverse approximately 60 m of a single line watercourse feature known as Weslie Creek. In addition, the access road leading to the Layover from Aurora Road traverses approximately 11 m of a second watercourse to Weslie Creek.</p> <p>The entire proposed Layover is situated within the Lake Simcoe Region Conservation's (LSRCA) Generic Regulation. Such regulations are meant to be a hazard management tool to protect people and property from natural hazard processes including flooding. Thus, a permit is required for construction of placing fill in areas subject to flooding or erosion.</p> <p>Approximately 4,000 m² of the Layover footprint is situated within an area of high aquifer vulnerability, which indicates that contaminated water is more likely to reach the aquifer at this location.</p> <p>The entire proposed Layover is situated within a Groundwater Recharge Area (factored into evaluation of 'Impact on Environmentally Sensitive Areas' below).</p>
Impact on Fisheries Resources (e.g., aquatic species and habitat)	<p>Moderate to High – Information received from the TRCA identifies Berczy Creek as a cool water thermal regime watercourse. Such fish species include brown bullhead, largemouth bass, northern pike, pumpkinseed, white sucker, yellow perch, blacknose dace, brook stickleback, fathead minnow, goldfish, creek chub, common shiner and northern redbelly dace. However, this project may have an indirect impact on fish as this watercourse is intermittent.</p> <p>Geographic Query of the Natural Heritage Information Centre (NHIC) website for Species at Risk indicates that no Species at Risk were recorded within or adjacent to the proposed Layover.</p>	<p>Moderate – Although information received from the TRCA does not indicate the presence of fisheries, fish habitat may be present given the wetland features and adjacent watercourses in the area.</p> <p>Geographic Query of the NHIC website for Species at Risk indicates that no Species at Risk were recorded within or adjacent to the proposed Layover.</p>	<p>High – Information received from the Ministry of Natural Resources as well as the Lake Simcoe Region Conservation Authority confirms that the cool water thermal regime watercourses affected by this option are fish bearing. Such species include white sucker, creek chub, brook stickleback and pumpkinseed.</p> <p>Geographic Query of the NHIC website for Species at Risk indicates that no Species at Risk were recorded within or adjacent to the proposed Layover.</p>
Impact on Terrestrial Environment (e.g., wildlife and vegetation)	<p>Low to Moderate – Situated within the Ontario Breeding Bird Atlas square No. 17PJ26 which identifies 59 confirmed breeding bird species (2nd atlas). Geographic Query of the NHIC website for Species at Risk indicates that no Species at Risk were recorded within or adjacent to the proposed Layover. However, development of this site will result in some disturbance to wildlife habitat.</p> <p>Development of the site would require the removal of approximately 29,000 m² of ground cover consisting primarily of fallow and fill.</p>	<p>Moderate to High – Situated within the Ontario Breeding Bird Atlas square No. 17PJ27 which identifies 56 confirmed breeding bird species (2nd atlas). Geographic Query of the NHIC website for Species at Risk indicates that no Species at Risk were recorded within or adjacent to the proposed Layover. However, development of this site will result in some disturbance to wildlife habitat.</p> <p>As the proposed site is not entirely situated within forest cover, vegetation impacts include approximately 12,500m² of mainly deciduous trees, with some areas of coniferous trees interspersed throughout. An additional approximately 9,500</p>	<p>High – Situated within the Ontario Breeding Bird Atlas square No. 17PJ27 which identifies 56 confirmed breeding bird species (2nd atlas). Geographic Query of the NHIC website for Species at Risk indicates that the delta-spotted spiketail was mapped within 1 km of the proposed Layover at this location. It is also noted that the red-shouldered hawk was mapped within the area; however the Ministry of Natural Resources (MNR) does not list this species to be at risk.</p> <p>Development of this site would require the removal of approximately 31,000 m² of dense forest comprised of both deciduous and coniferous types. Thus, the development of this</p>

EVALUATION CATEGORIES/CRITERIA	ALTERNATIVE LAYOVER FACILITY SITES		
	LAYOVER AT BETHESDA SIDEROAD (FIGURE 11)	LAYOVER AT BLOOMINGTON ROAD (FIGURE 12)	LAYOVER AT AURORA ROAD (FIGURE 14)
		m ² is comprised of dense grassland for a total removal of approximately 22,000 m ² .	site would result in a considerable disturbance to wildlife habitat.
Impact on Environmentally Sensitive Areas (e.g., Oak Ridges Moraine)	<p>Low to Moderate – The site is situated within the Oak Ridges Moraine (ORM) Planning Boundary and is designated in the ORM Conservation Plan as a Natural Linkage Area and Country Side Area.</p> <p>Land use within the Natural Linkage Area is limited to those uses permitted within Natural Core Areas. Existing land uses and some limited transportation and utility uses are permitted within the Natural Core Areas. The land uses normally permitted within the Country Side Area are similar to those uses that would be permitted in agricultural areas. The proposed Layover is not within an ORM Landform Conservation Area, which requires documentation identifying planning, design and construction practices.</p> <p>The access road to the proposed Layover facility is situated immediately adjacent to the Wilcox – St. George Wetland Complex, which is designated by the NHIC as a Provincially Significant Wetland.</p>	<p>High – The site is situated within the Oak Ridges Moraine (ORM) Planning Boundary and is designated in the ORM Conservation Plan as a Natural Linkage Area.</p> <p>Land use within the Natural Linkage Area is limited to those uses permitted within Natural Core Areas. Existing land uses and some limited transportation and utility uses are permitted within the Natural Core Areas. The land uses normally permitted within the Country Side Area are similar to those uses that would be permitted in agricultural areas. The site is also within a Category 2 Landform Conservation Area, which requires documentation identifying planning, design and construction practices that will keep disturbance to landform character to a minimum.</p> <p>The proposed Layover traverses approximately 15,000 m² of the provincially significant Environmentally Sensitive Area known as the Bloomington Wetlands. Additionally, the site is situated within the provincially significant White Rose Bog.</p> <p>The proposed Layover traverses approximately 3,500 m² of the Provincially significant wetland known as the White – Rose Preston Lake Wetland Complex. Review of the NHIC website indicates that the White Rose - Preston Lake Wetland Complex is provincially significant and sustains a high diversity of 77 wetland types. It is noted that the White Rose - Preston Lake Wetland Complex is situated within the greater area of the Bloomington Wetlands.</p> <p>Correspondence received from the Ministry of Natural Resources indicates that approximately 14,500 m² of the proposed Layover is situated within an Area of Natural and Scientific Interest known as the Vandorf Kettles.</p>	<p>High – Majority of the Layover site (approximately 21,000 m²) is situated within the Oak Ridges Moraine (ORM) Planning Boundary and is designated in the ORM Conservation Plan as a Natural Core Area. Existing land uses and some limited transportation and utility uses are permitted within Natural Core Areas. The site is also within a Category 2 Landform Conservation Area, which requires documentation identifying planning, design and construction practices that will keep disturbance to landform character to a minimum.</p> <p>The proposed Station is also situated within an Environmentally Sensitive Area known as the LSRCA's Groundwater Recharge Area, whereby permeable soil or rock allows water to readily seep into the ground.</p> <p>Information received from the MNR indicates that the entire Layover is located within a Provincially Significant Wetland known as the Bogart Creek Wetland Complex.</p> <p>Review of the Greenbelt Plan Area Maps indicates that approximately 10,000 m² of the northerly portion of the proposed Layover is situated within the Greenbelt Area and is within the Natural Heritage System designation. Such systems include areas of Protected Countryside with the highest concentration of the most sensitive and/or significant natural features and functions. Such land use policies include a full range of agricultural and agricultural related purposes and farming. New development or site alteration shall avoid negative effects on natural heritage features.</p>
SOCIO-ECONOMIC ENVIRONMENT			
Property Acquisition Requirements	Moderate – The development of this site would involve partial acquisition of one (1) private property and one (1) public property belonging to the Town of Richmond Hill.	Moderate – The development of this site would involve partial acquisition of one (1) public property belonging to the Ministry of Transportation.	Moderate to High – Development of the Layover will involve partial acquisition of three (3) private properties.
Total area of property required	Direct access to the Layover would be granted from Bethesda Sideroad and would require a portion of public land designated as the Town of Richmond Hill's road Right of Way.	Direct access to the Layover would be granted from an access road on the north side of Bloomington Road, east of the existing CN Bala Sub track, which is also owned by the MTO.	It is anticipated that direct access will be granted from the south side of Aurora Road and would require approximately 350 m ² of public land designated as the Region's Right of Way.
Total area of public property required	Approximately 26,750 m ²	Approximately 21,800 m ²	Approximately 31,000 m ²
Total area of private property required	Approximately 5,750 m ²	0	Approximately 350 m ²
Number of public property owners	Approximately 21,000 m ²	Approximately 21,800 m ²	Approximately 30,650 m ²
Number of private property owners	2 (municipal owned)	1 (provincially owned)	1 (municipal owned)
	1	0	3

EVALUATION CATEGORIES/CRITERIA	ALTERNATIVE LAYOVER FACILITY SITES		
	LAYOVER AT BETHESDA SIDEROAD (FIGURE 11)	LAYOVER AT BLOOMINGTON ROAD (FIGURE 12)	LAYOVER AT AURORA ROAD (FIGURE 14)
Residential Homes Affected	Moderate – The Proposed site will impact adjacent residential establishments.	Low – The location will not affect any residential homes on or offsite within 500 m.	Moderate – Layover would affect one (1) home owner adjacent to the access road. In addition, one (1) adjacent home within 500 m may also be impacted
No. of homes onsite	0	0	0
No. of homes offsite (within 500 m)	21	0	2
Compatibility with Existing and Designated Land Use	<p>Low to Moderate – A significant amount of the proposed Layover location is currently being used as vacant space. Field reconnaissance activities suggest the site has been filled. Current Town of Richmond Hill Official Plan is under review however land use planning from current Official Plan indicates Rural and Major Open Space designations. As per Official Plan Amendment 218, planned land use designations are consistent with ORM land use policies.</p> <p>Proposed development (West Gormley Secondary Planning Area) proposes to develop the area immediately west of Leslie Street for low, medium and high density residential uses. The proposed development includes a Master Environmental Servicing Plan, which must conform to Oak Ridges Moraine Conservation Plan.</p>	Moderate – The proposed Layover facility is situated on dense grassland, forest cover and wetland areas. Thus, it is not entirely compatible with Schedule A – Land Use Plan, which designates the area to be consistent with the ORM. (A proposed golf course has been proposed on the west side of the CN Track, and has been deferred to the Ontario Municipal Board).	High – Area is comprised of dense forest cover. Personal communication with the Town of Whitchurch-Stouffville indicates that OPA 113 is in progress and will incorporate Oak Ridges Moraine Conservation Plan policies.
Permanent Noise and Visual Impacts of Layover Facility	<p>Low to Moderate – The anticipated level of noise generated by the Layover would be considered minimal in comparison to the existing noise produced by freight trains operating the same route.</p> <p>(This Layover will have a low visual impact on adjacent residential properties, and the associated parking lot will have a low noise impact on similar properties in comparison to the existing freight trains within the area). However, offsite residential/commercial establishments may be exposed to visual impacts of the Layover.</p>	Low – The anticipated level of noise generated by the Layover would be considered low in comparison to the existing noise produced by freight trains operating the same route. In addition, it is directly adjacent to Highway 404 and there are no noise sensitive features (i.e. residential, institutional land uses) within 500 m of the Study Area. Visual impacts of the proposed Layover would be evident from the Highway, but are not considered to be impacted by any adjacent land uses.	Moderate to High – Increased visual/noise impacts on resident on Aurora Road. In addition to the two (2) residential dwellings offsite, the land uses adjacent to the site are comprised of commercial/industrial establishments that generate noise. In addition, noise impacts would be considered low in comparison to the existing noise produced by freight trains operating the same route.
Business Impacts	Moderate – There is one (1) onsite business and several offsite businesses, located adjacent to the proposed Layover.	Low – There is only one (1) storage location for a trailer renting/leasing business within 500 m of the Layover, which is on the east side of Highway 404. Thus, it is not expected to be impacted by this undertaking.	Moderate – There are no onsite businesses and adjacent offsite businesses are generally of a commercial/industrial nature. It is anticipated that this will impact business accessibility as well as goods movement.
No. of Businesses Onsite	1	0	0
No. of Businesses Offsite (within 500 m)	8	1	30
Agricultural Impacts	Low to Moderate – The site is currently not being used for agricultural related purposes, but has agricultural potential.	Low to Moderate – The site is currently not being used for agricultural purposes, but has agricultural potential.	Low to Moderate – This area is not being used for agricultural purposes, with the exception of two (2) properties adjacent to Slaters Road.
Agricultural Capability (Canada Land Classification (CLI))	The entire proposed Layover is situated on Peel Clay soils, which is a Class 1 soil that is considered to have the highest capability or potential for agriculture.	The entire proposed Station is situated on Woburn Loam soils, which is a Class 1 soil that is considered to have the highest capability or potential for agriculture.	A small portion of the proposed access road as well as a significant portion of the Layover (approximately 15,000 m ²) is situated on Percy Fine Sandy Loam soils, which have a CLI of 1 and are suitable for a wide variety of crop production. The remaining footprint area is situated within muck.
No. of Agricultural Complexes Onsite	0	0	0
No. of Agricultural Complexes Offsite (within 500 m)	1	0	2
Area of Agricultural Area Lost (those lands currently being used for agricultural purposes)	0	0	0
Construction Cost	Moderate – The Layover would require a future CN Track leading up to and beyond the proposed Layover facility. Utility relocations are minimal.	High – The Layover would require a future CN Track leading up to and beyond the proposed Layover facility. Utility relocations are minimal. However, site access is difficult from	Moderate to High – The proposed Layover would require a second track leading up to and beyond the Station location. In addition, some utility relocation would be required as utility poles are

EVALUATION CATEGORIES/CRITERIA	ALTERNATIVE LAYOVER FACILITY SITES		
	LAYOVER AT BETHESDA SIDEROAD (FIGURE 11)	LAYOVER AT BLOOMINGTON ROAD (FIGURE 12)	LAYOVER AT AURORA ROAD (FIGURE 14)
		a construction perspective given the landform/topographic features of the area.	situated to Aurora Road. There is also an additional cost involving forest clearing in order to construct the Station footprint.
Operational and Maintenance Costs	Moderate – Operational cost for moving the trains to pick up passengers in the morning and the evening will require a short reverse to reach Bloomington Station.	Low to Moderate – Operational cost for moving the trains to pick up passengers in the morning and the evening will require reverse move in the future when the Aurora Station is built.	Moderate – Operational cost for moving the trains to pick up passengers in the morning and the evening require empty moves south until Aurora Station is built and will require a reverse yard move thereafter.
CULTURAL ENVIRONMENT			
Impact on Built Heritage Features	Low to Moderate – There are no heritage features on site, however some heritage features are in close proximity.	Low – Communication with the Town of Aurora indicates that there are no areas with architectural and historical importance within the Study Limits.	Low – There are no heritage features on site.
No. of Heritage Buildings Onsite	0	0	0
No. of Heritage Buildings Offsite (within 500m)	5 (three (3) homes on Leslie Street, one (1) home on Bethesda Sideroad and one (1) former school called Lloyd Public School #7 Whitchurch, which is now a Region Works Yard)	0	0
Impact on Archaeological Resources	High – Potential for discovery of archaeological resources as 1993 GO Study indicates at least three (3) registered archaeological sites adjacent to the Layover. The 1993 GO Study suggests the area has high archaeological potential (Richmond Hill Corridor EA Study, GO Transit, 1993).	High – Given the areas of forest cover and wetland features, 1993 GO Study indicates that the Layover site has high archaeological potential in moderately drained locations and should be assessed by the excavation of test pits.	High – It is anticipated that undisturbed forest and stream crossings will warrant an Archaeological Assessment.
TECHNICAL REQUIREMENTS			
Track Installation, including Alignment	Low to Moderate – Although a siding track is within the CN Track in this location, a third track will need to be installed from Elgin Mills Road north to accommodate future GO Trains.	Low to Moderate – A new track will need to be installed from Elgin Mills Road north to accommodate future GO Trains.	High – A new track will need to be installed from Elgin Mills Road north to accommodate future GO Trains to Aurora Road.
Construction Footprint, including Staging and Grading	Moderate – The proposed Layover would be situated on relatively flat lands approximately 288 metres above sea level (masl), which is near grade with the existing CN Track. Areas of fill will need to be graded and/or replaced.	High – Although the Layover would be situated near grade with the CN Track, which is 312 masl, the surrounding area is situated approximately 10 masl higher than the surrounding road network. Thus, staging would be difficult as Bloomington Road is only 302 masl and grading of the future access road would be required as the roadway would increase by 10 masl within a distance of 175 m. Access will require a laneway across the grade separation over Bloomington Road.	Low – The proposed Layover would be situated on relatively flat lands approximately 296 masl, which is near grade with the existing CN Track. Staging and grading for construction purposes will utilize a long access road.
OVERALL RATING			
	Preferred	Not Preferred	Not Preferred

Table 11. Assessment of Alternative GO Train Station Sites

EVALUATION CATEGORIES/CRITERIA	ALTERNATIVE TRAIN STATION FACILITY SITES			
	STATION AT STOUFFVILLE ROAD (FIGURE 10)	STATION AT BLOOMINGTON ROAD (FIGURE 12)	STATION AT VANDORF SIDEROAD (FIGURE 13)	STATION AT AURORA ROAD (FIGURE 14)
NATURAL ENVIRONMENT				
Impact on Water Resources (e.g., surface water and groundwater)	<p>Low to Moderate – The Proposed Station will avoid approximately 600 m of a single line watercourse feature. However, the parking structure will impact an intermittent watercourse (approximately 60 m).</p> <p>The Station is situated within the Toronto and Region Conservation's (TRCA) Generic Regulation. Such regulations are meant to be a hazard management tool to protect people and property from natural hazard processes including flooding. Thus, a permit is required for construction of placing fill in areas subject to flooding or erosion.</p> <p>Approximately 8,000 m² is situated within high aquifer vulnerability, which indicates that contaminated water is more likely to reach the aquifer.</p> <p>The proposed Station will avoid the adjacent Rouge River Headwater Wetland Complex.</p>	<p>Moderate to High – Proposed Station will displace the approximately 240 m single line drainage swale that directly drains into the White Rose - Preston Lake Wetland Complex. Additional areas of intermittent ditching will also be impacted. The proposed Station is also situated within the Toronto and Region Conservation's (TRCA) Generic Regulation. Such regulations are meant to be a hazard management tool to protect people and property from natural hazard processes including flooding. Thus, a permit is required for construction of placing fill in areas subject to flooding or erosion.</p> <p>The entire Station footprint is situated within high aquifer vulnerability, which indicates that contaminated water is more likely to reach the aquifer.</p> <p>It is anticipated that the proposed Stormwater Management Pond will avoid the White - Rose Preston Lake Wetland Complex as it is to be constructed in the middle of the two (2) complexes. However, the proposed Station will impact approximately 4,000 m² of the Bloomington Wetlands.</p>	<p>Moderate to High – The proposed Station will impact approximately 25 m of a single line watercourse that passes through Vandorf Sideroad and the proposed future access road. This watercourse is part of a broader stream of rivers adjacent to the area, which is situated within wetland features and drains from the 8 m deep Van Nostrand Lake.</p> <p>In addition, the parking lot structure for this proposed Station is situated within the Lake Simcoe Region Conservation's (LSRCA) Generic Regulation. Such regulations are meant to be a hazard management tool to protect people and property from natural hazard processes including flooding. Thus, a permit is required for construction of placing fill in areas subject to flooding or erosion.</p> <p>Approximately 31,500 m² of the northern portion of the proposed Station is situated within high aquifer vulnerability, which indicates that contaminated water is more likely to reach the aquifer at this location.</p> <p>The access road of this proposed Station will avoid the provincially significant White Rose – Preston Lake Wetland Complex, which is approximately 957 m² in size.</p> <p>Approximately 43,000 m² of the Station footprint is situated within a Groundwater Recharge Area (factored into the evaluation of 'Impact on Environmentally Sensitive Areas' below).</p>	<p>High – Proposed Station will impact approximately 11 m of a single line watercourse as it will traverse the Station's access road. This watercourse directly drains into a small lake; approximately 7,000 m² located north of the proposed Station, west of the access road.</p> <p>The entire proposed Station is situated within the Lake Simcoe Region Conservation's (LSRCA) Generic Regulation. Such regulations are meant to be a hazard management tool to protect people and property from natural hazard processes including flooding. Thus, a permit is required for construction of placing fill in areas subject to flooding or erosion.</p> <p>Much of the Station footprint (excluding approximately 1,094 m² of the southern portion), is situated within high aquifer vulnerability, which indicates that contaminated water is more likely to reach the aquifer at this location.</p> <p>The entire proposed Station is situated within a wetland complex. The entire proposed Station is situated within a Groundwater Recharge Area (factored into the evaluation of 'Impact on Environmentally Sensitive Areas' below).</p>
Impact on Fisheries Resources (e.g., aquatic species and habitat)	<p>High – Information received from the Toronto and Region Conservation Authority (TRCA) identifies the watercourse impacted by this site is a cool water thermal regime. Such fish species include Brown Bullhead, Largemouth Bass, Northern Pike, Pumpkinseed, White Sucker, Yellow Perch, Blacknose Dace, Brook Stickleback, Fathead Minnow, Goldfish, Creek Chub, Common Shiner and Northern Redbelly Dace. However, this may be considered an indirect impact on fish as this watercourse is intermittent.</p> <p>Geographic Query of the NHIC website for Species at Risk indicates that the Redside Dace, which is a threatened aquatic species, was mapped within 1 km of the proposed Station.</p>	<p>Moderate to High – Information provided from the Toronto and Region Conservation Authority (TRCA) indicates the Study Area is traversed by a cool water watercourse. Thus, it is anticipated that this ditch supports fish species.</p> <p>Geographic Query of the NHIC website for Species at Risk indicates that no Species at Risk were recorded within or adjacent to the proposed Station.</p>	<p>High – Information received from the Ministry of Natural Resources as well as the Lake Simcoe Region Conservation Authority confirms that the cool water thermal regime watercourses impacted by this option are fish bearing. Such species include White Sucker, Blacknose Dace, Longnose Dace, Creek Chub, Brook Stickleback, Pumpkinseed, and Mottled Sculpin, Fathead Minnow, Rainbow Darter, Iowa Darter and Mottled Sculpin.</p> <p>Geographic Query of the Natural Heritage Information Centre (NHIC) website for Species at Risk indicates that no Species at Risk were recorded within or adjacent to the proposed Layover.</p>	<p>High – Information received from the Ministry of Natural Resources as well as the Lake Simcoe Region Conservation Authority confirms that the cool water thermal regime watercourses are fish bearing. Such species include White Sucker, Creek Chub, Brook Stickleback and Pumpkinseed.</p> <p>Geographic Query of the NHIC website for Species at Risk indicates that no Species at Risk were recorded within or adjacent to the proposed Layover.</p>

EVALUATION CATEGORIES/CRITERIA	ALTERNATIVE TRAIN STATION FACILITY SITES			
	STATION AT STOUFFVILLE ROAD (FIGURE 10)	STATION AT BLOOMINGTON ROAD (FIGURE 12)	STATION AT VANDORF SIDEROAD (FIGURE 13)	STATION AT AURORA ROAD (FIGURE 14)
Impact on Terrestrial Environment (e.g., wildlife and vegetation)	<p>Moderate – Situated within the Ontario Breeding Bird Atlas square No. 17PJ26 which identifies 59 confirmed breeding bird species (2nd atlas). Geographic Query of the NHIC website for Species at Risk indicates that the sharp-leaved goldenrod was mapped within 1 km of the proposed Station on the west side of the CN Track. Thus, development of this site will result in some disturbance to wildlife habitat.</p> <p>Development of the site would require the removal of approximately 37,500 m² of ground cover, including some minor forest/shrub cover of approximately 3,500 m².</p>	<p>Moderate – Situated within the Ontario Breeding Bird Atlas square No. 17PJ27 which identifies 56 confirmed breeding bird species (2nd atlas). Geographic Query of the NHIC website for Species at Risk indicates that no Species at Risk were recorded within or adjacent to the proposed Station. However, development of this site will result in some disturbance to wildlife habitat.</p> <p>Development of the site would require the removal of approximately 33,500 m² of ground cover consisting primarily of grassland and old field. In addition, approximately 2,100 m² of ground cover is required to reconstruct the new on ramp to Highway 404.</p>	<p>Moderate – Situated within the Ontario Breeding Bird Atlas square No. 17PJ27 which identifies 56 confirmed breeding bird species (2nd atlas). Geographic Query of the NHIC website for Species at Risk indicates that the Delta-spotted Spiketail, was mapped within 1 km of the proposed Station. The red-shouldered hawk was mapped within the area; however the MNR does not list this species to be at risk. The Mosquito Fern is a Species at Risk mapped within the query adjacent to the Van Nostrand Lake. Thus, development of this site will result in some disturbance to wildlife habitat.</p> <p>Development of the site would require the removal of approximately 53,000 m² of ground cover consisting primarily of grassland with some cattail vegetation.</p>	<p>High – Situated within the Ontario Breeding Bird Atlas square No. 17PJ27 which identifies 56 confirmed breeding bird species (2nd atlas). Also situated within the Ontario Breeding Bird Atlas square No. 17PJ37 which identifies 67 confirmed breeding bird species (2nd atlas).</p> <p>Geographic Query of the NHIC website for Species at Risk indicates that the Delta-spotted spiketail was mapped within 1 km of the proposed Station. It is also noted that the red-shouldered hawk was mapped within the area; however the MNR does not list this species to be at risk. Thus, development of this site will result in some disturbance to wildlife habitat.</p> <p>Development of this site would require the removal of approximately 47,000 m² of dense forest comprised of both deciduous and coniferous types. Thus, the development of this site would result in a considerable disturbance to wildlife habitat.</p>
Impact on Environmentally Sensitive Areas (e.g., Oak Ridges Moraine)	<p>Low to Moderate – The site is situated within the Oak Ridges Moraine (ORM) Planning Boundary and is designated in the ORM Conservation Plan as a Natural Linkage Area and Country side Area.</p> <p>Land use within the Natural Linkage Area is limited to those uses permitted within Natural Core Areas. Existing land uses and some limited transportation and utility uses are permitted within the Natural Core Areas. The land uses normally permitted within the Countryside Area are similar to those uses that would be permitted in agricultural areas. The proposed Station is not within an ORM Landform Conservation Area, which requires additional documentation identifying planning, design and construction practices.</p> <p>Review of the Natural Heritage Information Centre (NHIC) website and information received from the Ministry of Natural Resources (MNR) indicates that the Rouge River Headwater Wetland Complex is a provincially significant large and diverse complex, noteworthy for its headwater wetlands and adjacent upland woodlands. However, the proposed Station will avoid this significant feature in its entirety.</p>	<p>Moderate to High – The site is situated within the Oak Ridges Moraine (ORM) Planning Boundary and is designated in the ORM Conservation Plan as a Natural Linkage Area.</p> <p>Land use within the Natural Linkage Area is limited to those uses permitted within Natural Core Areas. Existing land uses and some limited transportation and utility uses are permitted within the Natural Core Areas. The site is also within a Category 2 Landform Conservation Area, which requires additional documentation identifying planning, design and construction practices that will keep disturbance to landform character to a minimum.</p> <p>The proposed Station traverses approximately 4,000 m² of the provincially significant Environmentally Sensitive Area known as the Bloomington Wetlands.</p> <p>Review of the NHIC website as well as information received from the MNR indicates that the White Rose - Preston Lake Wetland Complex is provincially significant and sustains a high diversity of 77 wetland types. It is noted that the White Rose - Preston Lake Wetland Complex is situated within the greater area of the Bloomington Wetlands. However, the proposed Station will avoid this significant feature in its entirety.</p>	<p>Moderate to High – The site is situated within the Oak Ridges Moraine (ORM) Planning Boundary and is designated in the ORM Conservation Plan as a Natural Linkage Area.</p> <p>Land use within the Natural Linkage Area is limited to those uses permitted within Natural Core Areas. Existing land uses and some limited transportation and utility uses are permitted within the Natural Core Areas. The proposed Station is not within an ORM Landform Conservation Area, which includes additional documentation identifying planning, design and construction practices.</p> <p>Review of the Natural Heritage Information Centre (NHIC) website indicates that the White Rose – Preston Lake Wetland Complex is a provincially significant wetland, which sustains a high diversity of wetland types. However, the proposed Station will avoid this complex.</p> <p>The proposed Station is also situated within an Environmentally Sensitive Area known as the Lake Simcoe Region Conservation Authority (LSRCA) Groundwater Recharge Area, whereby permeable soil or rock allows water to readily seep into the ground.</p>	<p>High – The site is not situated within the Oak Ridges Moraine (ORM) Planning Boundary. It is located just north of the Planning Boundary limits at this location. However, review of the Greenbelt Plan Area Maps indicates that the entire proposed Station is situated within the Greenbelt Area and is within the Natural Heritage System designation. Such systems include areas of Protected Countryside with the highest concentration of the most sensitive and/or significant natural features and functions. Such land use policies include a full range of agricultural related purposes and farming. New development or site alteration shall avoid negative effects on natural heritage features.</p> <p>The proposed Station is also situated within an Environmentally Sensitive Area known as the Lake Simcoe Region Conservation Authority (LSRCA) Groundwater Recharge Area, whereby permeable soil or rock allows water to readily seep into the ground.</p> <p>Information received from the MNR indicates that the entire Station is located within a Provincially Significant Wetland known as the Bogart Creek Wetland Complex.</p>

EVALUATION CATEGORIES/CRITERIA	ALTERNATIVE TRAIN STATION FACILITY SITES			
	STATION AT STOUFFVILLE ROAD (FIGURE 10)	STATION AT BLOOMINGTON ROAD (FIGURE 12)	STATION AT VANDORF SIDEROAD (FIGURE 13)	STATION AT AURORA ROAD (FIGURE 14)
			It is noted that the proposed Station footprint is immediately adjacent to the Vandorf Kettles, which is a Candidate Life Science Area of Natural and Scientific Interest within the Region.	
SOCIO-ECONOMIC ENVIRONMENT				
Property Acquisition Requirements	Moderate – The development of this site would involve partial acquisition of two (2) private properties. The Station footprint will involve one (1) private property, while the slight realignment of Gormley Road East will infringe on a second private property. Direct access to the Station would be granted from Stouffville Road and would require a portion of public land designated as the York Region's road Right of Way.	Moderate – The development of this site will acquire the northerly portion of one (1) public property belonging to the Ministry of Transportation. Due to the new grade separation that would occur as a result of the access road, a portion of the Ministry of Transportation's public property designated as a Highway Right of Way will be impacted, which will result in ramp relocation. Direct access to the Station would be provided via Bloomington Road and would also require a portion of the Ministry's property.	Moderate – The development of this site would involve partial acquisition of two (2) private properties. Direct access to the Station would be granted from Vandorf Sideroad and would require a portion of public land designated as the Town of Whitchurch-Stouffville Road Right of Way.	Moderate – the development of this site would involve partial acquisition of two (2) private properties. Direct access to the proposed Station would be granted from Aurora Road and would require approximately 350 m² of public land designated as the Town of Whitchurch-Stouffville Right of Way.
Total area of property required	Approximately 40,700 m²	Approximately 46,700 m²	Approximately 53,000 m²	Approximately 47,000 m²
Total area of public property required	Approximately 1,000 m²	Approximately 46,700 m²	Approximately 300 m²	Approximately 350 m²
Total area of private property required	Approximately 39,700 m²	0	Approximately 50,000 m²	Approximately 46,650 m²
Number of public property owners	1 (municipal owned)	1 (provincially owned)	1 (municipal owned)	1 (municipal owned)
Number of private property owners	2	0	2	2
Residential Homes Affected	Moderate to High – The development of this site would indirectly affect homes on the south side of Stouffville Road.	Low – The Station location will not affect any residential homes on or offsite within 500 m.	High – The proposed Station would impact the community of Vandorf as it is anticipated that the level of traffic to the area will increase.	Moderate – The proposed Station would affect one (1) home owner adjacent to the access road.
No. of homes onsite	0	0	0	0
No. of homes offsite (within 500 m)	47	0	65	1
Compatibility with Existing and Designated Land Use	Moderate – A significant amount of the proposed Station is currently being used for recreational site and agricultural purposes. Field reconnaissance activities suggest the site is proposed on agricultural/rural land. Current Town of Richmond Hill Official Plan is under review however land use planning from current Official Plan indicates Rural and Major Open Space designations. As per Official Plan Amendment 218, planned land use designations are consistent with ORM land use policies. Proposed development (West Gormley Secondary Planning Area) proposes to develop the area immediately west of Leslie Street for low, medium and high density residential uses. Master Environmental Servicing Plan is underway and must conform to Oak Ridges Moraine.	Moderate – The proposed Station is situated within areas of old field/grassland, with intermittent ditching throughout. This option is not compatible with existing land uses as the land is currently being used as a natural area. Review of the Richmond Hill Official Plan delineates the site as a Rural Area. As per Official Plan Amendment 218, planned land use designations are consistent with ORM land use policies.	Moderate to High – Existing land uses within the area include open field/grassland. Proposed development has been initiated over the proposed Station however the Town has yet to approve the plans until Official Plan Amendment 113 has been approved, which conforms to the Oak Ridges Moraine Conservation Plan.	High – Area is comprised of dense forest cover. Personal communication with the Town of Whitchurch-Stouffville indicates that OPA 113 is in progress and will incorporate Oak Ridges Moraine Conservation Plan policies. In addition, development of this area will be quite difficult as area is within the protected Greenbelt Plan.
Permanent Noise and Visual Impacts of Train Station	Low to Moderate – Potential noise produced by the Station is considered minimal in comparison to the existing noise produced by freight trains operating the same route. (This Station will have a low visual impact on adjacent residential properties, and the parking lot will have a low	Low – Potential noise impacts are considered to be low in comparison to the existing noise produced by freight trains operating the same route. In addition, the site is directly adjacent to Highway 404 and there are no noise sensitive features (i.e. residential, institutional land uses) within 500	High – The proposed Station will negatively impact the small community of Vandorf. However, such noise is considered minimal in comparison to the existing noise produced by freight trains operating the same route. In addition, it will disrupt the	Low to Moderate – In addition to the one (1) residential dwelling offsite, the land uses adjacent to the site are comprised of commercial/industrial establishments. In addition, noise impacts would be considered

EVALUATION CATEGORIES/CRITERIA	ALTERNATIVE TRAIN STATION FACILITY SITES			
	STATION AT STOUFFVILLE ROAD (FIGURE 10)	STATION AT BLOOMINGTON ROAD (FIGURE 12)	STATION AT VANDORF SIDEROAD (FIGURE 13)	STATION AT AURORA ROAD (FIGURE 14)
	noise impact on similar properties).	m of the Study Area. Visual impacts of the proposed Station would be evident from the Highway, but are not considered to be impacted by any adjacent land uses.	adjacent Vandorf Community Centre and will not be deemed visually accepting.	low in comparison to the existing noise produced by freight trains operating the same route.
Business Impacts	Moderate – The development will displace two (2) seasonal operations including a recreational/agricultural operation.	Low – There are no business impacts.	Moderate – There are no onsite businesses however there are several offsite businesses, located adjacent to the proposed Station.	Moderate – There no onsite businesses and adjacent offsite businesses are of a commercial/industrial nature, which are in close proximity.
No. of Businesses Onsite	2	0	0	0
No. of Businesses Offsite (within 500 m)	2	0	7	25
Agricultural Impacts	Moderate – Development of this site would require some agricultural lands.	Low to Moderate – The site is currently not being used for agricultural related purposes, but has agricultural potential.	Low to Moderate – The site is currently not being used for agricultural related purposes, but has agricultural potential.	Low – This area is not being used for agricultural purposes.
Agricultural Capability (Canada Land Classification (CLI))	Most of the proposed Station would be built on Peel Clay soils, which is a Class 1 soil that is considered to have the highest capability or potential for agriculture. Approximately 8,000 m² of the parking lot is situated within Bottom Land soils, which is a Class 7 soil with no capabilities for arable culture of permanent pasture.	The entire proposed Station is situated on Woburn Loam soils, which is a Class 1 soil that is considered to have the highest capability or potential.	Most of the proposed Station is situated on Brighton Sandy Loam – Over Gravel, which provides similar patterns with the extent of the Groundwater Recharge Area. Such soils have a CLI of 2, which signifies very few limitations to agricultural capabilities. In addition, the southern portion of the proposed Station (approximately 6,000 m² is situated on Bottom Land soils, which have no agricultural capabilities).	Majority of the proposed Station is situated on Granby Sandy Loam soils, which have a CLI of 4 and have severe limitations that restrict the range of crops, or require special conservation practices. In addition, a portion of the proposed access road and southern limit of the parking lot footprint are situated on Percy Fine Sandy Loam soils, which have a CLI of 1 and are suitable for a wide variety of crop production.
No. of Agricultural Complexes Onsite	0	0	0	0
No. of Agricultural Complexes Offsite (within 500 m)	2	0	1	0
Construction Cost	Low – The Station would require a second track and utility relocations appear minimal. There is a potential cost associated with rechanneling the existing watercourse feature. The construction cost also includes a signalized intersection, and new utilities, however it is noted that the bridge at Stouffville Road will not be widened.	Moderate – This proposed location will require the construction of a second track leading up to and beyond the Station location. In addition, this alternative requires an on-ramp reconfiguration from Bloomington Road to south of Highway 404 (west-south on-ramp). This on-ramp will have to be at a new grade separation as it will traverse the access road to the proposed Station. It will also require utility relocations in the form of street lighting adjacent to the on-ramp. In addition, a Stormwater Management Pond is required, as well as a signalized intersection and some new utilities. The new track over Bloomington Road will also require widening modifications to the existing CN bridge over Bloomington Road.	High – The proposed Station would require a second track leading up to and beyond the Station location. To this end, reconstruction of the existing CN bridge over Woodbine Avenue/Vandorf Sideroad would be required. In addition, some utility relocation would be required along Vandorf Sideroad as utility poles are situated on the north side of the road and will be impacted by the future access road.	High – The proposed Station would require a second track leading up to and beyond the Station location. It will also require an access road through the dense forest cover. In addition, some utility relocation would be required as utility poles are situated to Aurora Road. There is also an additional cost involving forest clearing in order to construct the Station footprint.
CULTURAL ENVIRONMENT				
Impact on Built Heritage Features	Moderate – Proposed Station will avoid the abandoned heritage home. However, the home may be displaced if future parking expansions are warranted.	Low – No heritage features would be affected.	Low to Moderate – There does not appear to be any built heritage features.	Low – There does not appear to be any built heritage features.
No. of Heritage Buildings Onsite	One (1) abandoned heritage home (in future parking expansion area)	0	0	0
No. of Heritage Buildings Offsite (within 500m)	29 (25 homes on Gormley Road, including Gormley Road East and West, Gormley Court, Station Road, and four (4) on Leslie Street).	0	0	0
Impact on Archaeological Resources	Moderate – Potential for discovery of archaeological resources as 1993 GO Study indicates at least two (2)	High – Review of the 1993 GO Study indicates that the area was not fully evaluated during the EA and should be	High – Based on the undisturbed areas of the site and proximity to adjacent watercourse crossings,	High – Based on the undisturbed areas of the site and proximity to adjacent watercourse

EVALUATION CATEGORIES/CRITERIA	ALTERNATIVE TRAIN STATION FACILITY SITES			
	STATION AT STOUFFVILLE ROAD (FIGURE 10)	STATION AT BLOOMINGTON ROAD (FIGURE 12)	STATION AT VANDORF SIDEROAD (FIGURE 13)	STATION AT AURORA ROAD (FIGURE 14)
	registered archaeological sites adjacent to the site. However, a Stage 2 Archaeological Assessment completed for the area concludes that the agricultural field is considered disturbed land. In addition, test pits were conducted for approximately 1,500 m ² and it was concluded that no significant cultural material was found. However, it was also recommended that approximately 12,000 m ² of the footprint was to be ploughed prior to a walking survey (Richmond Hill Corridor EA Study, GO Transit, 1993).	ploughed and assessed by pedestrian survey.	there are probable impacts to archaeological resources.	crossings, there are probable impacts to archaeological resources.
TECHNICAL REQUIREMENTS				
Impacts on Accessibility to the Site, including congestion at Rail Crossings over Access Roads	Low – The site provides convenient access from nearby populated areas via Stouffville Road. In addition, the entrance via Stouffville Road is accessible from Highway 404. The site is also located near the Stouffville Road Underpass.	Low – The site provides excellent access from Highway 404 via an access road directly from Bloomington Road. In addition, there will be no congestion at rail crossings as access roads are not at grade with tracks.	High – Field reconnaissance activities suggest that the site is not easily accessible as there is no highway interchange access at Vandorf Sideroad. Thus, access to the site would be granted via Woodbine Avenue from Bloomington Road or Aurora Road. Congestion at rail crossings would be minimal as the CN Track is on a grade separation from the roadways however the location of the traversing track bridge over Woodbine Avenue/Vandorf Sideroad does not create easy flowing traffic and thus may contribute to congestion with increased vehicle use. Vandorf Sideroad has a limited Right of Way width with no pavement markings and would thus need to be improved to accommodate an increase in vehicular use.	High – Although there is an exit off of Highway 404 at Aurora Road, commuters would have to travel approximately 2.5 km to the proposed future GO Station. In addition to this, the CN crossing at Aurora Road is at grade, which will likely create congestion at rail crossings as commuters would have to wait for the trains to cross.
Track Installation, including Alignment	Low to Moderate – A new track is required as there is an existing main and siding track north of Stouffville Road.	Moderate – A new track is required further north to accommodate the future proposed Station at Bloomington Road.	Moderate to High – Additional track installation further north of the other proposed Stations.	Moderate to High – Additional track installation furthest north of the other proposed Stations.
Construction Footprint, including Staging and Grading	Moderate – The development of the site requires a considerable area to be filled as the rail tracks are at a higher elevation (279 metres above sea level (masl)), while the adjacent construction site is 272 masl at the eastern limit of construction.	High – The construction footprint includes filling an area as the elevation ranges approximately 5 masl from 303 masl to 308 masl. It is noted that a small portion of this proposed undertaking will be on wetland areas, which may include filling.	Low – The proposed Station would be situated on relatively flat lands approximately 302 masl, which is near grade with the existing CN Track. Some utility relocation is required as utility poles are located adjacent to Vandorf Sideroad.	Low – The proposed Station would be situated on relatively flat lands approximately 296 masl, which is near grade with the existing CN Track.
Opportunities for Future Expansion of Parking Lot	Moderate – Expansion opportunities are restricted by further Archaeological clearance and approximately 145 m of a permanent watercourse. Future expansion opportunities may potentially occur on lands of fallow, which does not pose major restrictions.	Moderate – Expansion opportunities are not impacted as the proposed parking expansion is to occur within oldfield/grassland areas. However, further environmental testing, including additional Archaeological work may be required.	Low to Moderate – Expansion opportunities are not impacted as the adjacent landscape consists primarily of grassland and old field. However, it is anticipated that the future expansion will require some Archaeological clearance.	High – As this proposed Station would be developed in a dense forest, future expansion opportunities would result in the clearing of additional forests. Specifically, the future parking expansion would require approximately 30,000 m ² of one (1) private property as well as forest clearing.
OVERALL RATING				
	Preferred	Preferred	Not Preferred	Not Preferred

5.3 Evaluation of Preliminary Design Alternatives

Based on the assessment of net effects of the preliminary design alternatives with respect to the three (3) layover facility sites, the Bethesda Sideroad layover facility is the preferred alternative. In comparison to the other layover sites, the Bethesda Sideroad layover offers several advantages, most notable from a natural environmental perspective. Although this site is situated over an intermittent watercourse swale to Berczy Creek, in comparison to the other sites, it poses less of an impact on water resources (i.e., surface and groundwater), the terrestrial environment (i.e., wildlife and vegetation) as well as Environmentally Significant Areas (ESAs), including significant wetlands (see **Figure 15**).

Based on the evaluation of four (4) alternative GO station sites, Stouffville Road and Bloomington Road are preferred. Given the adjacency to the Community of Gormley as well as the West Gormley Secondary Plan and Highway 404, the Stouffville Road GO station represents several advantages over the Vandorf and Aurora Road GO stations. In addition to environmental preference (i.e., minimal impacts on wetland features and ESAs), the Stouffville Road GO station will alleviate commuting traffic off of Highway 404. Based on information received at both public information centres, the general need for this site is long overdue and the anticipated demand for this station will alleviate the capacities at the current Richmond Hill GO station.

At a time when the Stouffville Road GO station reaches capacity, which is anticipated to be in the near future, the Bloomington Road GO station will facilitate the expansion of GO services further north. Although this site will infringe on a portion of the Bloomington Wetlands, which is immediately adjacent to the CNR line, it will be designed to avoid the adjacent provincially significant wetlands. With access located immediately adjacent to Highway 404, this site is favourable from a socio-economic perspective. In addition to its compatibility with the Regional Municipality of York's *Transportation Master Plan*, it is within the area where the Ministry of Transportation (MTO) is considering the development of a car pool lot. As such, commuters will be encouraged to use GO facilities as an alternative route to Highway 404 (See **Figure 16** and **Figure 17**).

In summary, the Bethesda Sideroad layover facility as well as the Stouffville Road and Bloomington Road GO stations will efficiently and effectively solve the following issues:

1. Need for long term storage of an additional six (6) 12-car trains – The Bethesda Sideroad layover facility will store six (6) 12-car trains overnight.
2. Restricted yard space available for expansion – There is limited room for expansion within the current Richmond Hill GO station.
3. High deadhead mileage and costs – Currently, there are no train storage facilities within the Study Area. Consequently, in the morning, trains travel empty from GO's Willowbrook Rail Maintenance Facility in Mimico to the Richmond Hill GO Station. Later in the evening, empty trains travel back to the Willowbrook Facility for overnight storage.
4. Lack of track time available for deadhead train movement – The Richmond Hill line is currently owned by CN Rail, while GO Transit purchases track time.
5. Limited suitably sized sites to locate a storage or layover facility, while simultaneously protecting sensitive natural and socio-economic features – A Study Area Corridor from Major Mackenzie Drive to Aurora Road was assessed to determine feasible site locations. During the Study, it was determined that there were not any favourable sites south of Stouffville Road. In addition, provincial and municipal mandates have encouraged northern expansions.

6. Insufficient facilities available to meet the growth in demand for commuter rail services within Richmond Hill – The future Stouffville Road and Bloomington Road GO stations will expand GO services north within the Town of Richmond Hill, which will alleviate the current capacities at the Richmond Hill GO station as well as adjacent highway traffic.

Based on current schedules, the last train would arrive at the yard by 7:30 pm and shut down by 8:00 pm. In the morning, all trains would start up approximately one (1) hour before their service begins (e.g., between 5:00 am and 5:30 am). The expectation is that this effort will lead to the goal of six (6) daily rush hour trains (morning and evening) and, ultimately, all-day service within the Corridor.

Figure 15. Site photos of the Bethesda Sideroad Site



Figure 16. Site photos of the Stouffville Road Site



Figure 17. Site photos of the Bloomington Road Site



5.4 Public and Agency Consultation

During the design alternative stage of the EA (Stage 3), formal contact was made with the public and regulatory agencies in the form of a PIC to present the preliminary design alternatives for the proposed layover facility and future GO Train Stations. In anticipation of the second PIC, meetings were held with the following regulatory agencies:

Meeting with CN

A meeting was held with a CN representative on November 7, 2008. The purpose of this meeting was to review the upgraded and expanded plans for the proposed layover facility and sites for a future GO Transit station. The Division Engineer for Construction recommended that the layover facility be located near the GO Transit station to avoid backtracking.

Current GO Transit service along the Barrie Line was compared with current service along CN's Bala Subdivision to assist in estimating the travel time anticipated from the alternative sites to Union Station in Toronto. GO Transit confirmed that passenger travel time from the existing Aurora Station (CN Newmarket Subdivision) to Union Station is 41 minutes. Passenger travel time from the existing Richmond Hill Station (CN Bala Subdivision) to Union Station is 40 minutes.

From an operational perspective, GO Transit indicated that the Bloomington Road site offers the best service of all sites with limited passenger travel time and room for future expansion. Consideration of an interlocking signal configuration was recommended for sites near Bethesda Sideroad and Aurora Road. It was noted that the bridge span over Bloomington Road may need to be expanded. A copy of the meeting notes and a summary of comments received is attached in **Appendix B**. CN confirmed that they do not anticipate any problems with this project and CN Rail operations.

Meeting with the Town of Aurora

A meeting was held with representatives of the Town of Aurora on November 10, 2008. The purpose of this meeting was to review the upgraded and expanded plans for the proposed layover facility and sites for a future GO Transit station. The Manager of Policy, Planning and Development advised the Project Team to consider relevant policies of the Oak Ridges Moraine (ORM) as the Study Area Corridor falls within the ORM. The alternative site at Bloomington Road, for example, falls within a natural linkage designation. As a result, the project may require a needs assessment. AECOM informed the Town that the Project Team was aware of the ORM and understood that essential infrastructure/transportation facilities were permitted within natural linkage areas. This EA Study would demonstrate the need for this project and that implementation will have minimal impact on the surrounding environment. The Project Team was also advised to consider natural heritage information as there are a number of sensitive features that fall within the Study Area Corridor. AECOM noted that the Project Team was aware of environmental constraints at Bloomington Road and Aurora Road, and requested any applicable environmental or planning information that the Town could provide. A copy of the meeting notes and a summary of comments received is attached in **Appendix B**.

Meeting with the Town of Richmond Hill and York Region

A joint meeting was held with representatives of the Town of Richmond Hill and York Region on November 13, 2008. The purpose of this meeting was to review the upgraded and expanded plans for the proposed layover facility and sites for a future GO Transit station. The Town of Richmond Hill indicated an interest for GO Transit to promote northbound service, as well as reverse service, during the morning hours. The Town is also interested in Newkirk (current Richmond Hill Station) alleviation, thereby reducing the demand at this station.

The Town advised that commuters have expressed their concerns with the amount of parking spaces available at the Richmond Hill GO Station and have requested additional parking opportunities. Thus, additional GO facilities are required north of the current Richmond Hill Station. GO Transit noted that full service on the Richmond Hill line is anticipated within the next 15 years, which will be consistent with other GO projects. CN owns the Bala Subdivision line, which leaves GO Transit with less flexibility as the track also carries CN freight.

Deficiencies were noted along Bethesda Sideroad as there is no grade separation and road improvements are not being planned for several years. In consideration of the Study Area expansion, it was noted that York Region requested GO Transit to consider options further north in consideration of the Region's Official Plan. It was also suggested that the Stouffville access road be realigned to be consistent with the Gormley Road East residential entrance on the south side of Stouffville Road.

The Town noted several environmental constraints including wetlands, Environmentally Sensitive Areas (ESAs), and the Oak Ridges Moraine (ORM) for the Bloomington Road options. The Town also suggested that the site is constrained by drainage issues. AECOM noted that the Bloomington Road Right-of-Way is approximately 10 m lower than the surrounding landscape north of Bloomington Road, where a proposed layover facility is to be located. A copy of the meeting notes and a summary of comments received is attached in **Appendix B**.

Meeting with the Town of Whitchurch-Stouffville

A meeting was held with representatives of the Town of Whitchurch-Stouffville on November 19, 2008. The purpose of this meeting was to review the upgraded and expanded plans for the proposed layover facility and sites for a future GO Transit station. The Director of Planning and Building Services noted that the proposed Aurora station is situated within the Greenbelt Plan Area and is designated as a Natural Heritage System. Based on the Greenbelt regulations, it has been quite difficult to build public facilities within and adjacent to the Study Area Corridor. It was also noted that the area is situated within an Environmental Sensitive Area (ESA) under the Lake Simcoe Region Conservation Authority as it is designated as a Groundwater Recharge Area.

The Town indicated that there will not be much residential growth around this area of the Town of Whitchurch-Stouffville and that a future GO station would not be practical over the long term. The Vandorf station is viewed as a better alternative from an environmental perspective. If the Aurora Station was carried forward, a tier parking facility was suggested. In addition, acquiring property on the east side of the existing CN Bala Subdivision north of Slater Road would be a better alternative from an environmental perspective as it would be constructed on disturbed lands. However, accessibility to the site would be difficult as Slaters Road is a small rural road. The Town noted that the Vandorf station is constrained by the existing CN bridge pier situated in the middle of Woodbine Avenue/Vandorf Road, which obscures sight lines. Furthermore, improvements to Woodbine Avenue are not within York Region's 10 year forecast. A copy of the meeting notes and a summary of comments received is attached in **Appendix B**.

Meeting with the Ministry of Transportation and York Region

A joint meeting was held with representatives of the Ministry of Transportation and York Region on November 21, 2008. The purpose of this meeting was to review the upgraded and expanded plans for the proposed layover facility and sites for a future GO Transit station. During the meeting, it was noted that the bridge over Vandorf Sideroad crosses the roadway diagonally and it is perceived to cause visibility problems or interfere with the sight distance for traffic below. GO Transit was asked to consider widening this bridge. For the purpose of this Study, the bridge over Vandorf Sideroad is wide enough to accommodate the two required tracks leading to and from this station site, and therefore does not need to be replaced. However, the Project Team agreed to take a closer look at the need for widening the bridge at this location.

The Region asked if road improvements were being planned to improve access to the station sites. GO Transit anticipates only intersection improvements (e.g., improved signals at access points). Road improvements generally fall under municipal jurisdiction. The Region recommended consideration of bus bays for York Region Transit as part of the proposed design layout for the future GO Transit station. In addition, it was confirmed that the Region is proposing a carpool lot at the Bloomington Road site as part of its Transportation Master Plan.

The Ministry normally provides a distance of 200 m in the design of a ramp access before a decision point is negotiated. This allows drivers approaching the ramp access from the Highway at high speed (of up to 100 km per hour) a distance of 200 m before negotiating a left or right turn. The Ministry suggested that the Project Team refer to the Ministry's Access Guidelines for the design of the new ramp. A copy of the meeting notes and a summary of comments received is attached in **Appendix B**.

Meeting with the Local Conservation Authorities

A joint meeting was held with representatives of the Toronto and Region Conservation Authority and the Lake Simcoe Region Conservation Authority on December 16, 2008. The purpose of this meeting was to review the upgraded and expanded plans for the proposed layover facility and sites for a future GO Transit station. The TRCA is in general agreement of the project and advised that this project will benefit the anticipated growth of the area, while alleviating traffic from Highway 404. It was also noted that from an ecological perspective, the TRCA cannot support the extent of these alternatives in watercourse/wetland features and that more buffering is needed. However, it was also noted that watercourse features would be easier to mitigate via culverts than wetlands, which would essentially be entirely displaced. The intention is to minimize significant impact on flora and fauna in these preliminary preferred alternatives. Thus, the TRCA recommends modifying the layover/station footprints to further minimize negative environmental effects.

The TRCA advises not to propose any sites on wetland features as they would occur on muck soil types, which is a hazardous type of soil from a development perspective. Further, TRCA advised that strong mitigative measures will be required and that stormwater management should be presented with great detail. AECOM noted that the design will consider a state-of-the-art stormwater management facility and will be assessed during the EA. TRCA advised the Project Team to implement the Sustainable Technologies Evaluation Program (STEP), with regards to stormwater management implementation.

The TRCA and LSRCA reviewed the entire corridor for potential alternatives and agreed that wetland and/or watercourse features are present throughout. As a possible site for an alternative layover facility, it was suggested to have a layover facility immediately north of Vandorf Sideroad, at the location of the preliminary preferred Vandorf station footprint. Given that this site is within a Groundwater Recharge Area, it was noted that negative impacts can be mitigated. However, given the size of the proposed layover facility, the proximity to watercourses and the Community of Vandorf, and the costs associated with rebuilding the CN track pier within the Woodbine Avenue/Vandorf Sideroad intersection, this alternative is not considered feasible. A copy of the meeting notes and a summary of comments received is attached in **Appendix B**.

Public Information Centre No. 2

GO Transit held a second Public Information Centre (PIC) on January 22 and 27, 2009, to present and receive public/agency input on alternative design layouts and locations for the proposed layover facility and train stations within the Study Area Corridor. The PIC on January 22 was held at the Vandorf Community Centre on 14663 Woodbine Avenue in Whitchurch-Stouffville. A separate PIC session was held on January 27, 2009, at the Gormley Missionary Church on 120 Gormley Road in Richmond Hill. Both PIC sessions were held between 6:00 pm and 9:00 pm.

A notice inviting the public to attend the second PIC was published in the following newspapers:

Stouffville Sun-Tribune – Thursday January 15, 2009 and Saturday January 17, 2009
Richmond Hill/Thornhill Liberal – Thursday January 15, 2009 and Sunday January 18, 2009
Aurora/Newmarket Era Banner – Sunday January 18, 2009 and Tuesday January 20, 2009

In addition, notification letters were mailed to regulatory agencies listed in **Table 1** and to a study mailing list of 21 interested members of the public. All public and agency correspondence is included in **Appendix B**. Participants were invited to drop in at either of the two sessions between 6:00 pm and 9:00 pm to view display boards containing information about the project and to speak one-on-one with representatives from the Project Team. The following display boards were presented at the PIC:

- Welcome to Public Information Centre No. 2
- What is GO Transit?
- Background to the Study
- Rationale for the Study
- Group B Class EA Process
- Study Area Corridor
- Purpose of Public Information Centre No. 2
- Summary of Public Information Centre No. 1
- Summary of Comments Received
- Natural Environment
- Socio-Economic and Cultural Environment
- Transportation Environment
- Characteristics of Layover Facilities and GO Train Stations
- Site Alternatives (graphics)
- Comparative Evaluation of Alternative Designs/Locations for Proposed Layover Facility
- Comparative Evaluation of Alternative Designs/Locations for future GO Train Station(s)
- Preliminary Preferred Design Alternative/Location for the Proposed Layover Facility
- Preliminary Preferred Design Alternatives/Locations for future GO Train Station(s)
- Potential Impacts and Mitigation Measures
- Next Steps
- Remain Involved in the Study.

A PIC Brochure was distributed to participants summarizing the content of the display materials and outlining future Class EA activities to be carried out. A copy of the display materials and brochure is included in **Appendix B**. Participants were encouraged to fill in and submit a questionnaire to gauge feedback on the project. Written comments could be submitted during the PIC or emailed/faxed/mailed to members of the Project Team by February 16, 2009.

Representatives from GO Transit and AECOM were present at the PIC to provide information, answer questions, and receive comments from participants. The following representatives were in attendance:

- GO Transit:**
- Mr. George Atikian, Senior Project Officer (January 27, 2009)
 - Mr. Greg Ashbee, Project Coordinator (January 22 and 27, 2009)
 - Mr. Dan Francey, Manager, Transportation Planning and Development (January 22, 2009)
- AECOM:**
- Mr. Bill Hjelholt, Consultant Project Manager (January 22, 2009)
 - Mr. Cristian Huma, Lead Project Engineer (January 22 and 27, 2009)
 - Ms. Sonya Kapusin, Environmental Planner (January 22 and 27, 2009)
 - Mr. Larry Sarris, Environmental Planner (January 22 and 27, 2009)

In total, 29 people signed in at the PIC. This attendance record is in addition to the number of representatives attending from GO Transit and AECOM. Participants included nearby residents and property owners, as well as representatives from the Town of Richmond Hill, the Town of Whitchurch-Stouffville, and York Region.

Five questionnaires were submitted during the PIC by residents and/or property owners living near the Study Area Corridor. A summary of comments received at the PIC, and how they have been addressed, is provided in **Appendix B**. This summary has been prepared based on a review of questionnaires submitted by participants during the PIC, as well as issues/concerns recorded following one-on-one discussions with individual attendees.

Overall, many participants agreed with the Design Alternatives/Locations presented. Most participants preferred the location at Stouffville Road for a train station and the location at Bethesda Sideroad for the layover facility. Some participants questioned the need for a third station at Vandorf Road, while others encouraged better services within the northern part of the Study Area. After a thorough review of written and verbal comments received, the Vandorf Station was dropped from further consideration. As the third preferred site, the Vandorf Station has greater environmental constraints than either the Stouffville or Bloomington Station. The Vandorf Station can be revisited at a time when both the Stouffville and Bloomington stations approach capacity.

Notice of Study Completion

This study is classified as a ‘Group B’ project as per GO Transit’s *Class Environmental Assessment* (2005). The planning and design process for this project is documented within the ESR, which is made available at local review centres for a minimum 45-day public review period. A notice inviting the public to review the ESR was published in local newspapers. In addition, notification letters were mailed to regulatory agencies and individuals on the Study Mailing List.

If, after reviewing the ESR and consulting with GO Transit staff, a person or party believe that serious environmental concerns exist, they may write the Minister of Environment to request that the project be subject to a Part II Order requiring an Individual Environmental Assessment. This request may result in a formal government review and approval process. The request must be submitted to both the Minister and GO Transit in writing within the minimum 45-day review period. Alternatively, GO Transit may extend the review period for the purpose of addressing the concerns. If no requests for a Part II Order are received during the public review period, the project can proceed to detail design and construction.

6. Project Description

6.1 Engineering Characteristics

The preferred layover facility and two (2) GO stations will require an additional track on the east side of the CNR line from north of Elgin Mills Road. However, since the CN Bala Subdivision line is owned by CN Rail, the track will be constructed by CN in conjunction with the GO facility sites. Thus, the contents of this Environmental Study Report do not discuss the specifics of the additional CN track.

Bethesda Sideroad – Layover Site

The Bethesda Sideroad layover site will be constructed first. The 40 m x 750 m layover facility will be constructed immediately east of the CNR line ROW as shown in **Figure 11**, with a proposed access road from Bethesda Sideroad. The configuration of the layover includes six (6) storage tracks for six (6) 12-car trains with locomotives. Service roads are provided between the tracks for maintenance vehicles and personnel. An electrical substation building and transformer compound will be constructed on the north end of the layover to distribute sufficient power for yard lighting and wayside power to the trains. Power for the yard will be supplied by the local electrical utility PowerStream through a connection from Leslie Street or Stouffville Road (subject to confirmation of availability by PowerStream). Individual wayside power cabinets will be provided for each train to maintain heating, air conditioning, lighting, and to support cleaning operations. Secondary facilities for the yard include a maintainer storage shed, maintenance shed, and a garbage bin pad and enclosure for disposal of refuse from the trains.

The proposed design will incorporate a series of short transverse storm sewers and longitudinal perforated subdrains throughout the yard. The sewers will outlet to the perimeter ditches on the south side of the yard. The ditch will then outlet to the existing drainage courses. The design considers the existing drainage patterns, and matches them with the new development. Quality and Quantity control will be achieved with flow control weir(s) installed in the ditches just upstream of the pertinent outlets. Rip Rap protection is provided at each culvert and weir. Also, a significant quantity is provided to protect the existing slopes where the existing drainage courses will spill over the new slopes and into the new ditches.

Stouffville Road – GO Station

The Stouffville Road GO Station will be constructed after the above mentioned Bethesda Sideroad facility. As shown in **Figure 10**, it is located just north of Stouffville Road, immediately east of the CN Rail's mainline tracks ROW between Highway 404 and Leslie Street with an access road approximately 500 m west of the Highway 404/Stouffville Road interchange and approximately 590 m east of Leslie Street/Stouffville Road intersection. The GO Transit Station site occupies approximately 12.7 acres and provides a parking lot with a capacity of 850 parking spaces with 14 accessible parking spaces. GO Transit passenger service facilities include a station building adjacent to the parking lot, a passenger drop-off and pick-up area, a bus loop with a separate access and egress road, and a train platform. The GO Transit station building is a 2000 ft², single-storey structure featuring energy efficient and eco-friendly finishes. For customer service functions, it contains kiosks for ticketing and security, washrooms, and a waiting area. For operations and maintenance, a utility room and centralized electrical and mechanical rooms serve the project site.

Power for the station building site will be supplied by the local electrical utility PowerStream through a connection from Stouffville Road. Parking lot lighting will consist of 12 m light poles along the access road and bus loop areas, and high mast light poles for the parking areas. Regularly spaced 6 m light poles will be used for platform illumination.

An existing drainage course running north to south dictates the east edge of the site. The design layout maintains a 25 m setback along this boundary. A specific stormwater management strategy will be developed during detailed design to mitigate the impacts of the new parking lot and ancillary facilities. In consideration of the existing drainage patterns, the system will be implemented to control post-development quality and quantity before outletting into the existing drainage course.

Municipal water service is not available for the project site. A drilled well, in proximity to the station building, will likely be required to provide domestic water. Similarly, municipal sanitary service is also unavailable. A new septic system will be required. Gas service will be obtained from the existing gas line that runs along Stouffville Road or from a proposed gas line along Gormley Road East.

Bloomington Road – GO Station

A second GO Station site at Bloomington Road will be constructed a time following the aforementioned Stouffville Road GO Station. As shown in **Figure 12**, it is located just south of Bloomington Road, between CN Rail's ROW and Highway 404. The proposed access road to the GO Station from Bloomington Road requires the realignment of the W-S ramp to Highway 404. A grade separation between the on-ramp and the access road is required to align the entrance with the N-E/W ramp from Highway 404.

The GO Transit Station site occupies approximately 11 acres and provides a parking lot with a capacity of 700 parking spaces with 8 accessible parking spaces. GO Transit passenger service facilities include a station building adjacent to the parking lot, a passenger drop-off and pick-up area, a bus loop with a separate access and egress road, and a train platform. The existing rail bridge over Bloomington Road will be widened to accommodate the north end of the train platform. The GO Transit station building is a 2000 ft², single-storey structure featuring energy efficient and eco-friendly finishes. For customer service functions, it contains kiosks for ticketing and security, washrooms, and a waiting area. For operations and maintenance, a utility room and centralized electrical and mechanical rooms serve the project site.

Power for the station building site will be supplied by the local electrical utility PowerStream through a connection from Bloomington Road. Parking lot lighting will consist of 12 m light poles along the access road and bus loop areas, and high mast light poles for the parking areas. Regularly spaced 6 m light poles will be used for platform illumination.

A stormwater management pond at the south end of the site provides post-development quality and quantity control. Municipal water service is not available for the project site. A drilled well, in proximity to the station building, will likely be required to provide domestic water. Similarly, municipal sanitary service is also unavailable. A new septic system will be required. Gas service will be obtained from the existing gas line that runs along Bloomington Road.

6.2 Property Acquisition

Construction of the Bethesda Sideroad layover facility as well as the Stouffville Road and Bloomington Road GO stations will require partial acquisition of both public and private properties. The Bethesda Sideroad layover facility is situated within the Town of Richmond Hill and will require access from the south side of Bethesda Sideroad. As a result, a portion of public land designated as the Town of Richmond Hill's road Right-of-Way (ROW) will be required. It is anticipated that approximately 250 m² of the road ROW is required. In addition, a portion of the Town of Richmond Hill's land is required to construct the southern section of the Bethesda Sideroad layover facility, including the lead in tracks, which is anticipated to be approximately 5,500 m².

The Bethesda Sideroad layover facility will also infringe on a private property. The layover footprint will require approximately 11,000 m² of private property, which includes the access road. It is expected that another approximately 10,000 m² of property acquisition is required due to the irregular shape of the property and as a result of the traversing access road. It is noted that a portion of the layover facility platform and lead tracks are within the CN ROW.

The Stouffville Road GO station will be accessed via the north side of Stouffville Road and will therefore require a portion of the Region's road ROW, of approximately 1,000 m². In addition this site will displace two (2) land parcels, under the ownership of one (1) private property owner. Thus, it is anticipated that the entire southern land parcel will be purchased to form part of the GO station, which accounts for approximately 18,000 m². The footprint of the Stouffville Road GO station is anticipated to inflict upon approximately 13,000 m² of a second private land parcel. At a time when the parking expansion is extended, it is estimated that an additional approximately 8,000 m² of land will be required. In summary, the minimum property requirements to construct the footprint of the Stouffville Road GO station, including those lands designated as future parking expansion, will be approximately 40,000 m². It is noted that a portion of the GO station facility platform and lead tracks are within the CN ROW.

In addition to the required property to construct the GO Train Station, the preliminary design of this site includes the realignment of Gormley Road East, which provides access to Stouffville Road for the residents within the Community of Gormley. As Gormley Road East is to be realigned slightly to the west, it is anticipated that a second private property is to be affected. The total land required for the realignment of Gormley Road East is approximately 700 m².

The Bloomington Road GO station will be accessed via the south side of Bloomington Road. It is noted that the entire land parcel on both north and south sides of Bloomington Road, east of the CNR line and CN ROW, is owned by the Ministry of Transportation. Thus, property acquisition will involve land from a provincial agency and no private land owners. The Bloomington Road GO station footprint will require approximately 29,000 m² of the Ministry's property. An additional 1,200 m² is required from the Ministry to construct the storm water management pond, which is to be located on the south side of the GO station. It is noted that a portion of the GO station facility platform and lead tracks are within the CN ROW.

Approximately 16,500 m² of Ministry land will be required to expand the parking lot at such time it is warranted. However, previous discussions with the Ministry regarding the preliminary design alternatives have suggested that the Ministry is looking to develop a commuter lot within the southwest quadrant of the Highway 404/Bloomington Road interchange. Thus, the footprint of this future parking expansion may be modified. Given the access road on the south side of Bloomington Road, the southbound ramp from Bloomington Road to

Highway 404 within the southwest quadrant of the interchange is to include a grade separation. Additionally, this ramp is to be slightly realigned as per current Ministry design standards.

6.3 Environmental Effects and Mitigative Measures

This ESR considered the feasibility of constructing a layover facility within the Study Area Corridor. The Study also considered alternative locations for future GO stations. As the Study Area Corridor is on the CN Bala Subdivision, which is owned by CN Rail, the future rail line on the east side of the existing CNR line will be the responsibility of CN Rail. Thus, this section deals with environmental effects and mitigative measures for one (1) layover facility located south of Bethesda Sideroad and two (2) GO stations located on the north side of Stouffville Road and on the south side of Bloomington Road. A summary of environmental effects and proposed mitigative measures are provided in **Table 12**.

Table 12. Proposed Mitigative Measures to Environmental Effects

A. PRIOR TO AND DURING CONSTRUCTION			
Environmental Issue/Concern/Effect		Proposed Mitigative Measure	
No.	Details	No.	Details
1.0	Water Resources (including groundwater and surface water)		
1.1	Potential migration of sediment from the construction site into watercourses and/or wetland features.	1.1	The Stouffville Road and Bethesda Sideroad sites are situated over areas of intermittent watercourses. The Bloomington Road station is situated adjacent to a wetland feature. Contractor shall ensure applicable erosion and sediment control measures are in place prior to commencement of any construction activities and remain in place until all disturbed areas are fully stabilized. Erosion and sediment control measures shall be inspected on a regular basis to ensure they are functioning properly and are maintained and/or upgraded as required. Proposed measures include: <ul style="list-style-type: none">mulching and hydroseeding 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 <i>Erosion and Sediment Control Guideline for Urban Construction</i> (2006) and/or as specified in Contract Drawings;regular maintenance (clean-out) of ditches to minimize sedimentation build-up; and,Implement Ontario Provincial Standard Provision (OPSS) 577, which provides construction specifications for above noted measures.
1.2	Potential erosion of newly exposed cut and fill slopes and ditches.	1.2	Use soft, vegetative stabilizing treatments (e.g. seeding, shrubs, trees, ground cover). 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 a qualified Environmental Inspector with regard to sediment control and establishment of a maintenance protocol to respond immediately to identified problems.
		1.3	Avoid or at least minimize movement of heavy machinery on slopes that are prone to erosion.
		1.4	During Detail Design, review and implement as best possible the initiatives outlined in the TRCA's Sustainable Technologies Evaluation Program (STEP). For example, determine the feasibility of greenroofs, permeable pavement and/or sediment control ponds (namely at Bloomington Road), among others.
1.3	Disrupting, diverting, changing, interfering of (intermittent) watercourses and/or wetlands	1.5	It is noted that the sites are within the TRCA's Generic Regulation. In accordance with Ontario Regulation 166/06 (Development, Interference with Wetlands and Alterations to Shorelines and Watercourses), a permit is required from the TRCA prior to any such works. These works also include

A. PRIOR TO AND DURING CONSTRUCTION			
Environmental Issue/Concern/Effect		Proposed Mitigative Measure	
No.	Details	No.	Details
			development such as, but not limited to grading and construction of buildings.
		1.6	Implement the TRCA's <i>Valley and Stream Corridor Management Program</i> (VSCMP) into the Detail Design Study, as best possible.
1.4	Potential to disrupt groundwater flow pattern and impair groundwater quality/quantity.	1.7	The need for dewatering during construction will be determined during the Detailed Design phase. If dewatering is required during construction, the dewatering scheme will be reviewed with the TRCA prior to implementation. Groundwater quality will be tested to ensure that discharge from dewatering activities, if warranted, meets local Sewer Use By-law criteria. If dewatering effluent is to be discharged to the natural environment, the effluent will be treated prior to its release.
		1.8	<ul style="list-style-type: none">direct all runoff and overland flows away from working areas and areas of exposed soilsstore and handle all oils, lubricants, and other chemicals in accordance with MOE policies and other applicable provincial/federal regulationsrefuel and maintain construction vehicles only in areas designated by the Contract Administrator; preferably on a paved, impermeable surface, and more than 30 m from the tributaries to Berczy Creek and wetlands.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.
		1.9	If construction dewatering discharge is greater than 50,000 litres per day, a Permit to Take Water (PTTW) will be secured from the MOE in accordance with the PTTW Manual (2005).
2.0	Aquatic Species and Habitat		
2.1	Potential impacts to fisheries resources and habitat due to in-stream works.	2.1	Any in-water works or work on channel banks shall be restricted to a period from July 1 to September 15. Consultation with the TRCA shall be carried out during Detail Design to confirm the appropriate environmental protection measures, operational constraints, and in-water work timing restrictions. In-water work timing restrictions shall also be confirmed with the Ministry of Natural Resources (MNR).
		2.2	Silt barriers shall be installed approximately 2 m from the final toe-of-slope for any disturbed embankment areas adjacent to watercourses.
		2.3	Fisheries investigations shall be forwarded to the TRCA to establish a streamlined approach to addressing the <i>Federal Fisheries Act</i> . Given that the TRCA has a Level 3 Agreement with DFO, consultation with the TRCA will be carried out to determine if the proposed works will result in a Harmful Alteration, Disruption or Destruction (HADD) of fish habitat. If a HADD is determined and cannot be mitigated, a compensation

A. PRIOR TO AND DURING CONSTRUCTION			
Environmental Issue/Concern/Effect		Proposed Mitigative Measure	
No.	Details	No.	Details
			package will be prepared for DFO authorization. It is noted that a federal <i>Fisheries Act</i> Authorization will trigger the <i>Canadian Environmental Assessment Act</i> (CEAA).
		2.4	Dewatered effluent should be treated in advance of discharge to the receiving watercourse.
		2.5	Heavy equipment should be secluded from inundated areas.
		2.6	All activities, including maintenance procedures, should be controlled to prevent the entry of petroleum products, debris, rubble, concrete or other deleterious substances into the corridor's watercourses or roadside ditches that discharge to nearby watercourses. Vehicular refuelling and maintenance will be conducted away (minimum of 30 m) from all identified watercourses.
		2.7	Good housekeeping practices should be implemented during construction in relation to materials storage/stockpiling, equipment fuelling/maintenance, etc.
		2.8	Removal or disturbance of woody vegetation shall be minimized during construction in order to prevent unnecessary loss of watercourse shading, over hanging cover, or bank stability.
	Fisheries Habitat Enhancement	2.9	If in-water works are required at locations of perched culverts, it is recommended that the perched culverts be replaced or rehabilitated to allow fish passage.
3.0	Terrestrial/Wildlife Species		
3.1	Potential loss of vegetation.	3.1	Tree removal shall be avoided between May 1 and August 1 (regardless of the calendar year) to prevent the incidental take of migratory birds or their nests as per the Migratory Birds Convention Act (1994). In the event construction works must be conducted during the breeding bird season, that is, May 1 to August 1, a nest survey shall be conducted by a qualified Avian Biologist prior to commencement of construction activities to identify and locate active nests of species covered by the Migratory Birds Convention Act (1994). If nesting activities are observed during clearing/construction activities, works in that area shall cease and the MNR should be contacted immediately.
		3.2	Review and implement as best possible the strategies outlined in the TRCA's Terrestrial Natural Heritage System Inventory (TNHSS) to improve the quality and quantity of terrestrial habitats.
		3.3	Implement the TRCA's <i>Valley and Stream Corridor Management Program</i> (VSCMP) into the Detail Design Study, as best possible.
3.2	Potential effects on mature (i.e., specimen) trees and wildlife species.	3.4	Existing trees/herbaceous species to be removed/relocated due to construction activities are to be confirmed during the Detailed Design stage.
		3.5	Mature (specimen) trees to be preserved shall be pruned and fertilized to promote survival/rehabilitation.
		3.6	All areas disturbed during construction will be reseeded and revegetated immediately with native (non-invasive) species.

A. PRIOR TO AND DURING CONSTRUCTION			
Environmental Issue/Concern/Effect		Proposed Mitigative Measure	
No.	Details	No.	Details
		3.7	Re-establish vegetation to maintain habitat typical of opportunistic wildlife species. Vegetative species to be determined during the Detailed Design phase, following consultation with TRCA. Although no negative impacts to Species at Risk are anticipated as a result of the proposed undertaking, if any terrestrial/wildlife Species at Risk are observed during construction, the MNR and TRCA should be contacted immediately.
		3.8	Delineation of vegetation clearing zones and vegetation retention zones will be made clear in construction specifications and in the field.
		3.9	Appropriate edge planting strategies shall be utilized along any newly created edges of wooded areas.
		3.10	A qualified Environmental Inspector is recommended to oversee the environmental aspects of construction at the field level. The Environmental Inspector's primary responsibilities are to: <ul style="list-style-type: none">advise construction crews on environmental matters;ensure that the mitigation and monitoring requirements outlined in this Report (and to be contained within the Contract Documents) are carried out effectively; and,that construction activities are carried out in compliance with permit conditions, and the Town of Richmond Hill's environmental policies.
4.0	Environmentally Sensitive Areas		
4.1	Impacts to the Oak Ridges Moraine	4.1	See Water Resources above. Ensure the policies within the <i>Oak Ridges Moraine Conservation Plan</i> are understood and practiced prior to and during construction.
4.2	Impacts to sensitive wetland features	4.2	See environmental issues above. Implement the TRCA's <i>Valley and Stream Corridor Management Program</i> (VSCMP) into the Detail Design Study, as best possible.
4.3	Impacts to Areas of Natural and Scientific Interest (ANSIs)	4.3	None required.
5.0	Property Acquisition		
5.1	Partial acquisition of both public and private properties	5.1	Commitment to provide fair market value for land and/or compensation for damages due to acquisition.
5.2	Potential loss of public and private access during construction.	5.2	All public and private access to be maintained at all times.
6.0	Community Issues		
6.1	Potential disruption to motorists and residents during construction.	6.1	Prior to commencing construction activities, the public, regulatory agencies and property/business owners will be notified regarding the scheduling of construction activities. Temporary access re-routings are not anticipated for the Stouffville Road and Bethesda Sideroad sites, however may be warranted for the Highway 404 ramp reconfiguration at Bloomington Road.
6.2	Potential disruption to emergency vehicles (ambulance, police, fire).	6.2	Emergency services will be kept informed of construction activities and scheduled to minimize/avoid delays during an emergency.

A. PRIOR TO AND DURING CONSTRUCTION			
Environmental Issue/Concern/Effect		Proposed Mitigative Measure	
No.	Details	No.	Details
6.3	Potential noise impacts to residents during construction.	6.3	Noise produced during construction is temporary and will be addressed as part of timing restrictions.
		6.4	Contractor shall adhere to all applicable Noise By-laws of the Town of Richmond Hill.
		6.5	Contractor to ensure that all construction equipment be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts.
		6.6	Idling of equipment shall be restricted to the minimum necessary to perform the specified work.
6.4	Potential to affect safety of road users and construction workers.	6.7	Due to productivity and safety concerns, construction activities will be carried out during daylight hours, except under special conditions where night time construction is warranted (scheduling delays).
		6.8	Implement signage/speed restrictions to minimize hazards.
		6.9	Follow Ministry of Labour Occupational Health and Safety Regulations for construction sites.
6.5	Potential effects on pedestrian and/or cyclist movements.	6.10	Safe passage shall be maintained at all times.
6.6	Potential reduction in air quality due to dust and/or equipment emissions.	6.11	Water and/or commercial dust suppressants approved by the MOE to be used during construction to reduce dust emissions.
		6.12	Contractor to sweep road clean at the end of each work day if mud has been tracked onto the roadway.
		6.13	Contractor to comply with all applicable by-laws for dust control and emissions.
7.0	Physiography, Geology and Soils		
7.1	Impacts to subsurface conditions.	7.1	Prior to construction, a geotechnical investigation will be carried out during Detail Design to confirm subsurface conditions of the proposed sites. At this time, the results will confirm if the sites are suitable to support the expansion and recommend what mitigative measures shall be implemented.
7.2	Grading and excavation operations may increase surface erosion.	7.2	The Contractor shall monitor all construction activities to ensure that excavated soils remain intact (i.e., do not migrate from the work area).
		7.3	If there are excessive amounts of rain, excavated soils shall be secured using silt fencing and straw bales, where appropriate.
		7.4	Any and all slopes cleared or modified during construction shall be stabilized as soon as reasonably possible following construction with a native (non-invasive) cover to minimize erosion.
		7.5	Where warranted, geotextile cloths and silt fencing will be used to minimize off-site silt movement. All construction activities will be performed as expeditiously as possible to minimize environmental impacts.
8.0	Contaminated Soils		
8.1	Potential risk to construction	8.1	A program of limited sampling and chemical testing of soil is

A. PRIOR TO AND DURING CONSTRUCTION			
Environmental Issue/Concern/Effect		Proposed Mitigative Measure	
No.	Details	No.	Details
	personnel.		recommended prior to construction to determine appropriate management of excess excavated soil. The specific details regarding the limited sampling and soil testing program shall be determined during the Detailed Design phase.
		8.2	In the event that contaminated soils are encountered during construction, the Contract Administrator or Inspector shall determine the level and type of contamination as expediently as possible. Should the excavated materials be deemed "contaminated", the soils shall be handled and disposed in compliance with Ontario Regulation 347 under the Environmental Protection Act. Moreover, the health and safety protocols specified under Regulation 839 of the Ontario Occupational Health and Safety Act shall be adhered to when encountering contaminated soils/materials.
9.0	Archaeological and Heritage Resources		
9.1	Potential to disturb archaeological resources.	9.1	Further archaeological investigations (i.e., a Stage 1 and Stage 2 assessment) shall be completed during the Detail Design phase. Once Archaeological Clearance is received from the Ministry of Culture, then construction can commence.
		9.2	Review the TRCA's comprehensive watershed management strategies, which include recommendations regarding archaeological resources within the Rouge River watershed.
		9.3	In the event deeply buried archaeological resources are found during construction, the office of the Heritage Operations Unit, Ministry of Culture, will be contacted. In the event that human remains are encountered during construction activities both the Ministry of Culture and the Registrar of Cemeteries, Cemeteries Regulation Unit of the Ministry of Government Services, will be contacted, in addition to the York Regional Police Service, the local coroner and the Town.
10.0	Rail Operations		
10.1	Potential impacts to CN's existing rail operations along the CNR line.	10.1	Communicate with CN Rail prior to and during construction to minimize interference and to further streamline the expansion efforts (i.e., installation of a new CN track on the east side of CNR line).

B. AFTER CONSTRUCTION			
Environmental Issue/Concern/Effect		Proposed Mitigative Measure	
No.	Details	No.	Details
11.0	Water Resources (including groundwater and surface water)		
11.1	Potential for increase of overland flows (i.e. water quantities) to watercourses.	11.1	The potential for increase of overland flows will be assessed, and measures to address water quantity concerns will be developed, during the Detailed Design phase.
11.2	Deterioration of water quality due to stormwater runoff.	11.2	Best management practices for stormwater management in relation to this project will be evaluated during the Detailed Design stage for review and approval by the TRCA.

B. AFTER CONSTRUCTION			
Environmental Issue/Concern/Effect		Proposed Mitigative Measure	
No.	Details	No.	Details
		11.3	Monitor and/or assess any recommended implementations during the Detail Design pertaining to TRCA's STEP program.
12.0	Aquatic Species and Habitat		
12.1	Potential impacts to fisheries resources and habitat.	12.1	The Construction Administrator or Environmental Inspector will be responsible for carrying out a visual inspection of all disturbed lands, and all lands where seeding, sodding and/or vegetative planting have been installed to ascertain the level of success of revegetation efforts and to assess success of erosion control measures.
		12.2	The Construction Administrator or Environmental Inspector will assess the stability of the intermittent watercourse banks. Any features determined to be unstable will be stabilized.
13.0	Terrestrial/Wildlife Species		
13.1	Potential impact on ecological features, landforms and functions.	13.1	Re-establish vegetation to maintain habitat typical of opportunistic wildlife species.
		13.2	Monitor and/or assess the effectiveness of the TNHSS, which is to be reviewed and implemented as best possible during Detail Design.
14.0	Landscaping		
14.1	Potential visual effects of new GO site facilities.	14.1	Existing vegetation will be retained and may be buttressed with new vegetation.
		14.2	Existing trees will be pruned and fertilized to promote rehabilitation.
		14.3	Alternative landscape treatments to be identified and evaluated during the Detailed Design phase.
		14.4	A post-construction monitoring and environmental inspection program will be implemented to ensure, to the extent possible, that lands disturbed as a result of construction activities will be restored to their original use and condition as soon as possible after construction.
		14.5	To this end: <ul style="list-style-type: none">• surplus excavated material (provided it is free of contaminated soils) will be removed to an environmentally suitable location;• all temporary culverts will be removed (if applicable);• all disturbed areas will be seeded with a cover crop consisting of a mixture of grasses and legumes indigenous to the Study Area; and,• native trees or shrubs will be planted to reinstate removed growth, and to augment vegetation at visually sensitive locations, or to serve as an erosion control measure.
15.0	Aesthetics		
15.1	Visual impact due to new GO site facilities.	15.1	Native trees or shrubs will be planted to reinstate removed growth, and to augment vegetation at visually sensitive locations.
		15.2	Following construction, lands disturbed as a result of construction activities will be restored to their original use and condition to the extent possible. All disturbed areas will be

B. AFTER CONSTRUCTION			
Environmental Issue/Concern/Effect		Proposed Mitigative Measure	
No.	Details	No.	Details
			rehabilitated, re-stabilized and re-vegetated immediately upon completion of the construction works.
16.0	Community Issues		
16.1	Potential noise increases from additional GO trains	16.1	Up to approximately five (5) years ago, there were no locomotive restrictions on GO trains. Technological advancements on Trains (i.e., rubber tires) are more stringent on noise and environmental impacts including fuel use.
		16.2	The future track leading up to the GO stations and layover facility will be continually welded together, which will mitigate the 'clicking' of tracks when trains are travelling over them.
		16.3	Train whistling will be kept to a minimum, where warranted and will not infringe on roadside safety.

6.4 Permits and Approvals

Completion of Stages one (1) through three (3) of the GO Transit Class EA process does not replace or negate the need to obtain a number of permits or approvals pursuant to other applicable federal, provincial and/or municipal legislation prior to construction. The various agency and utility permits/approvals required to facilitate the expansion of GO services along the CN Bala Subdivision within the Study Area Corridor include:

- TRCA (Development, Interference with Wetlands and Alterations to Shorelines and Watercourses permit Ontario Regulation 166/06), related to works within the regulated flood plain and within watercourses, and sign-off on Stormwater Management Plan;
- As per a Level 3 Agreement between TRCA and DFO, sign-off will be required from the TRCA to determine the potential for a HADD. If a HADD is determined, a federal *Fisheries Act* Authorization will be required. The need for a *Fisheries Act* Authorization will trigger CEEA;
- MOE (Approval under the *Ontario Water Resources Act*), related to Stormwater Management Plan. In addition, GO will require a PTTW in the event construction dewatering discharge is estimated to be greater than 50,000 litres per day;
- Applicable permits and approvals from the Town of Richmond Hill;
- CN Agreement to permit construction of the future GO stations and layover facility within their ROW;
- Confirmation of potentially affected utilities, including current Town of Richmond Hill municipal infrastructure (Agreement on and Approval of construction procedures to cross these facilities); and,
- Consultation with Richmond Hill Hydro (Agreement for power supply, illumination and signal plant).

In addition to the above, archaeological clearance will need to be secured from the MCL prior to construction. Due to the high archaeological potential within the Study Area Corridor:

- A Stage 1 and 2 Archaeological Assessment will be conducted for lands that will be directly impacted by the Bethesda Sideroad layover facility as well as the Stouffville Road and Bloomington Road GO stations (A copy of the Archaeological Assessment Report shall be forwarded to the First Nations identified in this study upon completion of the Stage 2 assessment).

Pursuant to the MCL's *Archaeological Assessment Technical Guidelines* (1993), a licensed Archaeologist will be retained should significant cultural resources be identified during the construction of the site. The role of the Archaeologist will be to bring the sites to the attention of the MCL and develop an impact mitigation strategy in consultation with the Ministry to minimize the impacts of construction on the resources. In addition, if any archaeological remains are unearthed during construction, immediate measures will be undertaken to protect the site in accordance with the mitigation strategy proposed for the site. At this time, a permit to excavate or alter archaeological and historical sites will be required from the Ministry.

6.5 Commitments to Further Investigations

Detail Design

During the Detailed Design stage, further investigations are warranted to confirm the existing environmental features within and immediately adjacent to the construction footprint of the three (3) sites. As this will occur during Detail Design, a more concise understanding of mitigative measures will be outlined, including the extent of commitments (e.g., whether the project will trigger a CEEA). Such investigations that will be conducted during Detail Design for all three (3) sites include:

- A Stage 1 and Stage 2 Archaeological Assessment (including additional work if warranted) to identify areas of archaeological concern. Clearance from the Ministry of Culture must be obtained prior to the commencement of construction activities.
- Additional fisheries and terrestrial investigations, if warranted, to obtain permits/approvals in concurrence with Conservation Authority, MNR and DFO regulations. Consultation with the TRCA and MNR must be carried out during Detail Design to confirm the appropriate environmental protection measures, operational constraints, and in-water work timing restrictions.
- In the event construction works must be conducted during the breeding bird season, from May 1 to August 1 (regardless of calendar year), a bird nest survey shall be conducted by a qualified Avian Biologist prior to commencement of clearing/construction activities.
- A Geotechnical Investigation is required to document the subsurface conditions of the proposed sites given their physiographic locations.
- A Groundwater Study is required for the proposed sites to determine groundwater characteristics including quantity/quality for several reasons. The sites are situated within areas of high aquifer vulnerability, are within the Oak Ridges Moraine and are the source of water for residents within the Community of Gormley and beyond. In addition, GO stations will be serviced by groundwater wells.
- An Environmental Site Assessment (ESA) is required to determine the extent of contaminated soils and to confirm potential on-site and off-site sources of contamination.
- A Stormwater Management Plan is required to confirm stormwater impacts and mitigation for the three (3) different sites.

Prior to Construction

Upon completion of the Detailed Design component, GO Transit will have a good understanding of the proposed construction start date. Once the exact date has been established, GO Transit will consult all agencies and utility companies who may be affected by the proposed undertaking to discuss the project's implications and the permit/approval requirements. Agencies and utility companies to be contacted will include:

- Department of Fisheries and Oceans (DFO) (if warranted);
- Ministry of Transportation;
- Ministry of Culture;
- Ministry of the Environment;
- Ministry of Natural Resources;
- Toronto and Region Conservation Authority;
- Ministry of Municipal Affairs and Housing;
- CN Rail;

- Town of Richmond Hill;
- Hydro One;
- Enbridge Gas;
- Bell Canada;
- Rogers Cable; and,
- PowerStream.

7. Implementation and Monitoring

7.1 Implementation Schedule

The proposed implementation schedule as noted in **Section 1.5** is as follows:

Environmental Study Report	July, 2009
45-Day Review Period	August/September, 2009
Consultant Assignment	October, 2009
Detailed Design	October, 2009
Tender and Awarding	March, 2010
Construction Completion	May, 2011

This schedule is subject to the permits/approvals discussed in **Section 6** and other field investigations to be conducted during Detail Design.

7.2 Construction Activities

The construction phase for each of the project sites consists of the following common works and activities:

- Construction of a new mainline track parallel to the existing mainline by CN Rail
- Site preparation including removal of vegetation
- Utility extension/connection and protection/relocation including Hydro, gas, water, telephone
- Construction of drainage works for storm and sanitary
- Installation of site lighting
- Provisions for Closed Circuit Television (CCTV) and security
- Grading
- Pavement
- Fencing
- Landscaping

Construction of the layover facility consists of the following works and activities in addition to those indicated above:

- Trackwork including subballast, ballast, ties, rail, and turnouts
- Related signal work
- Construction of the substation building and transformer compound
- Installation of related electrical ductbanks

The construction phase for each of the GO Station sites consists of the following additional works and activities:

- Retaining wall and Rail bridge widening where required (ancillary work)
- Municipal/provincial road realignment where required (ancillary work)
- Construction of the GO Station building
- Installation of a 315 m train platform
- Construction of a parking lot with an access road and bus loop

Construction activities would occur during the course of a calendar year. The current schedule anticipates that the work commences in March, 2010 and continues through to completion the following February. This progress hinges, however, on close coordination with the railway's construction of the additional mainline track.

Environmental protection measures will be implemented along vulnerable edges of the construction work and in watercourse areas before commencement of any earthworks. Trackbed or parking lot site works will then begin, including removal of all organics, and topsoil, or other deleterious materials within the grading limits. Additional soil will be removed or placed as required depending on the topography and proposed grade for the site. Where possible, excavated material will be used as fill or redistributed along the project site.

Site drainage will use longitudinal subdrains and transverse perforated pipe laterals connected to perimeter ditches, which will outlet into the existing drainage course adjacent to the site. Stormwater management may require the construction of a stormwater management pond or other measures to control post-development quality and quantity.

With the subgrade and drainage in place, perimeter or platform curbs will be installed where required to prepare for various pavement types. Layering of pavement structures or trackbeds will then commence. For asphalted surfaces, granular subbase and base layers will be placed and compacted to the recommended depths, over which layers of asphalt will be compacted to the final grades. For trackbeds, a 225 mm to 300 mm layer of subballast will be placed to receive the new track. The subballast is quarried rock of varying grain size, selected for its favourable drainage characteristics, and compaction properties to help distribute the load below the ties. Track construction, involving the placement of ties, tie plates, and rail, will continue over the trackbed, followed by a ballasting operation. This material will be placed and compacted using standard track maintenance equipment.

7.2.1 Ancillary Work

The base for access roadways will be constructed at the outset of the projects to allow construction vehicles and equipment to enter and leave the site.

During grading operations, the power supply infrastructure work will be completed, including power supply ducts that will run under tracks or paved areas. Concurrently, the stormwater management pond will be constructed and erosion control measures will be implemented.

Track construction, including associated turnouts, signals, crossings and fencing will follow after grading operations. Following the trackwork, the substation building and transformer compound will be constructed and wayside power units will be installed at appropriate locations.

Platform, parking lot, and GO Station building construction will commence after the layover facility is complete. Initial site servicing and drainage works are followed by grading operations, and site electrical works. The construction of the station building will run concurrently with the site grading and the installation of paved surfaces. Site lighting, communications, security fencing, and landscaping will be the final components of the project.

7.3 Monitoring

Pursuant to MOE and GO guidelines covering noise levels, construction activities will be constrained to normal daily working hours, and normal construction equipment will be employed. Minimal noise impacts are anticipated.

Following completion of the project and initiation of service, noise monitoring will be undertaken to measure the impact on the adjacent environment. Close observation of impacts on sensitive receptors, if any, will be provided. Should noise levels exceed MOE or GO guidelines, mitigating measures will be deployed. A full list of mitigation, prior to and during construction, as well as post construction is provided in **Section 6** of this report.

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