



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

**The Gore Road Improvements from
Patterson Sideroad to Highway 9
Municipal Class Environmental
Assessment (Schedule B)
Project File Report**

Prepared By:

R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2 Mississauga ON L5N 8R9

Prepared for:

Regional Municipality of Peel

November 2013

File No: MTB019424.0000

The material in this report reflects best judgement in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. R.J. Burnside & Associates Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Executive Summary

The Gore Road is classed as a 'Major Road' within the Region of Peel's Official Plan (2005). As defined in the Official Plan a "Major Road" accommodates the movement of medium to high volumes of traffic (relative to its urban or rural context) between significant activity nodes or more localized elements of the overall road network and provide a high transportation capacity inter-municipal service.

The area under study extends along The Gore Road from just north of Patterson Sideroad to Highway 9 within the Town of Caledon.

Why Undertake This Study

The Region has identified the need to rehabilitate The Gore Road between Patterson Sideroad and Highway 9. Poor pavement, inadequate shoulders, sight distance limitations due to rolling terrain, and drainage are all issues that need to be examined and addressed prior to reconstruction of this arterial. Further, as owners and operators of The Gore Road, the Region has the responsibility to ensure that the future travel demands are accommodated in a proper and efficient manner.

What is the Preferred Solution?

In accordance with good environmental practice an evaluation framework was developed to analyze and evaluate various alternative solutions including:

1. The "Do Nothing" Alternative: This alternative represents a continued operation with no changes. This alternative did not meet the traffic needs nor allow for any assessment of the existing features of the road or allow for any improvements.
2. Rehabilitate Existing Pavement: This alternative proposes mainly paving improvements to address the current pavement distress. No other improvements to The Gore Road are considered under this alternative. This alternative does not provide an opportunity to improve road shoulders and existing drainage nor assess the existing features of the road.
3. Two Lane Full Reconstruction: This alternative provides the opportunity to improve the condition of the road base and address the deteriorating pavement condition as well as providing an opportunity to improve the vertical/horizontal alignment and improve shoulder areas and drainage.

Overall, the Two Lane Full Reconstruction Alternative was recommended as the preferred solution to address the various issues on The Gore Road. This preference

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

was presented to and accepted by the public at a Public Information Centre which was held on May 23, 2013 at the Caledon Community Complex.

Description of the Selected Design

The preferred alternative for the rehabilitation of The Gore Road is detailed in Section 6.0 of this report. In summary the improvements consist of:

- Improved vertical and horizontal alignments.
- Widen and pave shoulder areas to allow for improved road side stops and road base stability and facilitate Active Transportation.
- Initiation of a pilot project shown to systematically reduce run-off-road events. The Region plans to add narrow rumble strips under the edge line pavement marking to add an alert to drivers who may cross into the paved shoulder. This approach will improve The Gore Road for pedestrians, cyclists and motorists. The rumble strips will have a skip pattern applied in order to allow cyclists to enter and exit the paved shoulder.
- A rural cross-section including 3.5 m wide vehicle lanes and 1.75 m paved shoulders with a pavement structure comprised of 150 mm depth of asphalt, 150 mm of granular A and 500 mm of granular B for the majority of the study area;
- A semi-urban cross-section including 3.5 m wide vehicle lanes and 1.75 to 2 m paved shoulders with mountable curbs with the same pavement structure as rural cross-section.
- Temporary construction easements or property acquisition will be required in specific locations along the length of the project to accommodate the proposed typical section, large cuts, and improved road side drainage.
- 323 trees will need to be removed in the roadside vegetation over the length of the project.

Cost Estimate for Improvements to The Gore Road

The estimated cost of engineering and construction to undertake the improvements as outlined in this report is estimated at approximately \$9,860,000. This estimate does not include the cost of property acquisition. The detailed summary of costs is contained in Appendix K.

Proposed Mitigation Measures

In order to mitigate potential impacts of the proposed project on the environmental features of the study area, several mitigation measures are proposed for the implementation stage (pre-construction and construction). In general, mitigation measures have been proposed for the following aspects of the environment:

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

- Surface Water/Hydrology;
- Soils and Sedimentation;
- Stormwater Management;
- Groundwater;
- Noise/Vibration/Air Quality;
- Fish and Fish Habitat;
- Archaeology/Heritage;
- Land Use/Land Acquisition; and
- Human Health and Safety.

Monitoring activities which will begin prior to mobilization by the contractor and end at the conclusion of the construction maintenance period (i.e., one or two years following construction completion depending on contract requirements) include:

- Preconstruction photographs, records and contact with existing residents.
- Erosion and sedimentation controls to be inspected daily and following rain events during the resident inspection period by a Certified Inspector of Sediment and Erosion Control. Controls requiring repair or replacement to be addressed immediately.
- Traffic management conditions are to be assessed on a daily basis and adjustments made as necessary to ensure safe vehicle operation on the roadway.
- An ongoing review of the storm water management controls to ensure that they are operating properly.
- The boundaries of the road construction project are to be inspected weekly to ensure all works and materials are kept within the assigned limits of the project.
- One week following site restoration, review all seeding and sodding and landscaping to check for washouts or areas requiring remediation.
- During the contractor's maintenance period, all new vegetation and natural restoration must continue to be watered and monitored.

Municipal Class EA Planning Process

This study falls under a Municipal Class EA, Schedule B process. This process which is documented in this report solicits input and approval from regulatory agencies, the municipality and the public at the local level. This process leads to an evaluation of alternatives in view of the significance of environmental impacts and the choice of effective mitigation measures.

At the completion of the EA study, the report is filed and placed on public record for 30 days following a Notice of Study Completion. Concerns regarding a project should be

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

brought to the attention of the proponent within the 30 day review period after the Notice of Completion has been issued. If the concern is not resolved through discussion with the proponent, a person/party raising the objection may request the proponent to voluntarily conduct a higher level study (i.e. Schedule B project to Schedule C or Schedule B or Schedule C project to an individual environmental assessment). If the proponent declines this request, the person/party with the concern may submit a written request to the Minister of Environment to make an order for the project to comply with Part II of the Environmental Assessment (referred to as a "Part II Order"). Submissions must be received within the 30 day review period with a copy forwarded to the proponent.

Table of Contents

Executive Summaryi

1.0 Introduction.....1

1.1 Municipal Class EA Planning Process..... 1

1.2 The Assessment Project File Report 2

1.3 Problem/Opportunity Statement 2

1.4 Alternative Solutions 3

1.5 Description of the Preferred Alternative..... 4

2.0 Alternative Solutions7

3.0 Road/Traffic Network.....8

3.1 Background..... 8

3.2 Existing Conditions 8

3.3 Existing Traffic Demands 8

3.4 Safety Review12

3.5 Future Traffic Conditions..... 14

4.0 Description of the Environment.....19

4.1 Land Use 19

4.1.1 Region of Peel’s Official Plan 19

4.1.2 Town of Caledon’s Official Plan 19

4.1.3 Greenbelt Plan20

4.1.4 Oak Ridges Moraine Conservation Plan20

4.1.5 Provincial Policy Statement.....21

4.2 Terrestrial Environment.....21

4.2.1 Designated Areas21

4.2.2 Designated Species22

4.2.3 Tree Inventory.....22

4.2.4 Vegetation Communities22

4.2.5 Wildlife and Wildlife Habitat.....27

4.2.6 Amphibians29

4.3 Aquatic Environment.....30

4.3.1 Humber River Watershed.....30

4.3.2 Natural Heritage.....31

4.3.3 Aquatic Species at Risk31

4.3.4 Aquatic Conditions32

4.3.5 Constraints.....35

4.3.6 Opportunities35

4.3.7 Recommendations35

4.4 Hydrogeology and Groundwater Conditions.....36

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

4.5	Stormwater Drainage/Stormwater Management	36
4.5.1	Roadway Swale Improvements.....	37
4.5.2	Fluvial Geomorphology Assessment.....	38
4.6	Existing Utilities/Services	38
4.7	Natural Hazards.....	38
4.8	Cultural and Built Environment.....	39
4.9	Archaeology/ Heritage	40
4.10	Socio-economic Features	40
4.10.1	Demographics.....	41
4.10.2	Economic Development	41
4.10.3	Dwellings	42
5.0	Evaluation of Alternative Solutions and Selection of the Preferred Solution	48
5.1	Description of Alternatives	48
5.1.1	Do Nothing.....	48
5.1.2	Rehabilitate Existing Pavement.....	48
5.1.3	Two-Lane Full Reconstruction.....	48
5.1.4	Summary of the Preferred Alternative Solution	49
6.0	Evaluation of Alternative Design Concepts for Preferred Solution.....	50
6.1	Description of Alternative Designs	50
6.2	Preferred Design Concept.....	50
6.3	Additional Project Upgrades.....	51
6.4	Preliminary Cost Estimate.....	51
6.5	Geotechnical Investigation	51
7.0	Impacts and Mitigation	55
7.1	Surface Water/Hydrology & Soils and Sedimentation/Stormwater Management	55
7.2	Groundwater	56
7.3	Noise/Vibration/Air Quality	57
7.4	Fish and Fish Habitat	57
7.5	Archaeology/Heritage	58
7.6	Vegetation, Wetland and Wildlife/Habitat	59
7.7	Land Use/Land Acquisition	64
7.8	Human Health and Safety	64
8.0	Follow-up Commitments	65
9.0	Public Consultation	66
9.1	Summary of Issues and Resolutions	67
9.2	Public Information Centre.....	74
9.3	The Notice of Completion.....	75
10.0	References	77

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

Table of Contents (Continued)

Tables

Table 3.1	Existing 2010 Intersection Performance	11
Table 3.2	Level of Service ¹ Criteria for Unsignalized Intersections	12
Table 3.3	2021 Intersection Performance.....	16
Table 3.4	2031 Intersection Performance.....	17
Table 3.5	Intersection Performance The Gore Road/Highway 9 Intersection with Traffic Signal Control.....	18
Table 4.1	Amphibian Survey Results	30
Table 4.2	Culvert Dimension (Current and Proposed) Summary	37
Table 4.3	Population and Employment Rate in Town of Caledon, 2006 to 2011	41
Table 4.4	Employment by Industrial Sector in Town of Caledon, 2006.....	41
Table 6.1	Criteria for Evaluating Alternatives.....	52
Table 7.1	Summary of Wetland Area Loss	62
Table 7.2	Summary of Vegetation Area Loss	63
Table 9.1	Summary of Agency Comments and Responses.....	68

Figures

Figure 1.1	Location Plan	5
Figure 1.2	Municipal Class EA Process.....	6
Figure 3.1	Gore Road 2010 Existing AM/PM Peak Hour Traffic Volumes.....	10
Figure 3.2	2021 Traffic Volumes The Gore Road – Patterson Sideroad to Highway 9	15
Figure 3.3	2031 Traffic Volumes – The Gore Road – Patterson Sideroad to Highway 9	16
Figure 4.1	Existing Environment Key Plan.....	43
Figure 4.2A	Existing Environment.....	44
Figure 4.2B	Existing Environment.....	45
Figure 4.2C	Existing Environment.....	46
Figure 4.2D	Existing Environment.....	47

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

Table of Contents (Continued)

Appendices

- A Road Safety
 - A1 Road Safety Audit
 - A2 White-Tailed Deer Motor Vehicle Collisions Report - Town of Caledon
- B Tree Inventory and Butternut Health Assessment
- C Breeding Bird Survey
- D Public and Agency Consultation
 - D1 Notice of Commencement
 - D2 Public Information Centre
 - D3 Agency Contact List
 - D4 Agency Correspondence
 - D5 Stakeholder Correspondence
- E The Gore Road: Mitigation and Monitoring Proposal for Wildlife Connectivity
- F Aquatic Habitat Mapping and Photo Record
- G Stormwater Management Report
- H Cultural Heritage Resource Assessment
- I Archaeological Assessments
 - I1 Stage 1 Archaeological Assessment
 - I2 Stage 2 Archaeological Assessment
- J Preliminary Road Drawings and Cross Sections
- K Preliminary Cost Estimate
- L Structure and Culvert Inspections Report
- M Geotechnical Investigation Report

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

1.0 Introduction

The Region of Peel has identified the need to reconstruct The Gore Road (Regional Road 8) from Patterson Sideroad to Highway 9, a distance of 6.3 km, in the Town of Caledon. Poor pavement, rolling terrain, sight distance limitations, and drainage, are all issues that need to be addressed. Figure 1.1 illustrates the study limits for this project.

The Region initiated a Class Environmental Assessment (EA), through their consultant, R.J. Burnside & Associates Limited (Burnside), for the improvements to The Gore Road in the Town of Caledon prior to proceeding with a rehabilitation strategy. This undertaking was completed in accordance with the planning and design process for Schedule B projects as outlined in the Municipal Class Environmental Assessment (October 2000, as amended 2007 and 2011) and which is approved under the *Ontario Environmental Assessment Act*.

The Region completed a Road Safety Audit in August 2011 (Appendix A1). The collision data from 2005 to 2009 revealed 41 reportable collisions. Of the 41 reportable collisions, 56.1% were considered animal collisions and 85.4% occurred in clear conditions. Given the traffic volume and distribution of traffic, the safety performance of The Gore Road is within expected levels for similar Regional roads. Nevertheless, opportunities to improve the road were identified which included:

- upgrading deer crossing signage;
- improve overall road geometrics; and
- provide active transportation features, like pedestrian/cyclist facilities.

1.1 Municipal Class EA Planning Process

The planning of major municipal infrastructure projects or activities is subject to the Environmental Assessment Act, R.S.O. 1990, and requires the proponent to complete an Environmental Assessment. The Municipal Class EA process was developed by the Municipal Engineers Association (MEA), in consultation with the Ministry of the Environment (MOE), as an alternative method to Individual Environmental Assessments for recurring municipal projects that were similar in nature, usually limited in scale and with a predictable range of environmental impacts, which were responsive to mitigating measures. The Municipal Class EA solicits input and approval from regulatory agencies, the municipality and the public at the local level. This process leads to an evaluation of the alternatives in view of the significance of environmental impacts and the choice of effective mitigation measures.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

A flow chart in Figure 1.2, portrays the Municipal Class EA procedure. There are three categories of assessment within the Municipal Class EA procedure dependent on the complexity and potential for environmental impact (Schedule A and A+ – negligible impacts, Schedule B – modest impacts, Schedule C – significant impacts).

The Municipal Class EA also provides an opportunity for any member of the public or agency to request the Minister of the Environment to order a Municipal Class EA project to become subject to an Individual Environmental Assessment. This is known as a Part II Order (or “bump-up”) request and is made in certain circumstances where concerns are unresolved during the Municipal Class EA planning process.

The proposed reconstruction of The Gore Road between Patterson Sideroad and Highway 9 is considered to be a Schedule B activity. Schedule B projects generally include improvements and minor extensions to existing infrastructure. The project has the potential for some mitigable environmental impacts and requires the completion of only Phases 1 and 2 of the Municipal Class EA procedure (Figure 1.2). Public consultation is required at two stages under a Schedule B project. At the completion of Phase 2, if there are no outstanding concerns, then the Region may proceed to implementation.

1.2 The Assessment Project File Report

In accordance with the Municipal Class EA process for a Schedule B project, this Assessment Project File Report identifies the following:

- Problem/Opportunity Statement;
- Alternative solutions to address the problem;
- The existing natural, social and economic environment;
- Potential impacts of the alternative solutions on the existing environment and appropriate mitigation measures;
- An evaluation of the alternative solutions;
- The consultation process undertaken throughout the project; and
- Selection of the preferred alternative.

1.3 Problem/Opportunity Statement

Based upon a review of background data, site reviews and an in-service road safety audit, the following conclusions were reached:

- The pavement on The Gore Road between Patterson Sideroad and Highway 9 has reached its life expectancy and requires rehabilitation/reconstruction.
- The road base and side slopes are in need of stabilization.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

- The road structure, road shoulders and road drainage require upgrading to meet current design standards.
- The rolling terrain causes poor sight lines and visibility problems for private entrances and intersections.
- A basic two-lane pavement with added traffic signal control¹ at The Gore Road/ Highway 9 intersection is sufficient to accommodate traffic growth within the planning period.

In reconstructing The Gore Road, there is the opportunity not only to focus on geometric design options but also to provide for the following opportunities for improvement:

- Improve travel needs of all roadway users over the next 20 years;
- Include Active Transportation facilities;
- Improve stormwater quantity and quality with flat bottom ditches; and
- Maintain The Gore Road's rural character without compromising existing features.

1.4 Alternative Solutions

In order to address the problem/opportunity statement identified above, the following alternative solutions have been proposed, and are described further in Sections 2.0 and 5.0:

- Do Nothing;
- Re-pave Existing Two Lanes; and
- Two-Lane Full Reconstruction.

Section 5.0 provides the evaluation of the alternatives used to select the preferred alternative as described below in Section 1.3 and detailed in Section 6.0. The alternative solutions will consider the effects on engineering, public safety and the environment.

¹ The intersection of Highway 9 and The Gore Road is under the jurisdiction of the Ministry of Transportation (MTO). MTO are currently conducting an EA in this area and their preliminary plans at this time calls for the future signalization of Highway 9/The Gore Road intersection together with minor road widening to accommodate left turn lanes on Highway 9 and a northbound right/left turn lane on The Gore Road at Highway 9 as well as the closure of the Coolihans Sideroad intersection at Highway 9.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

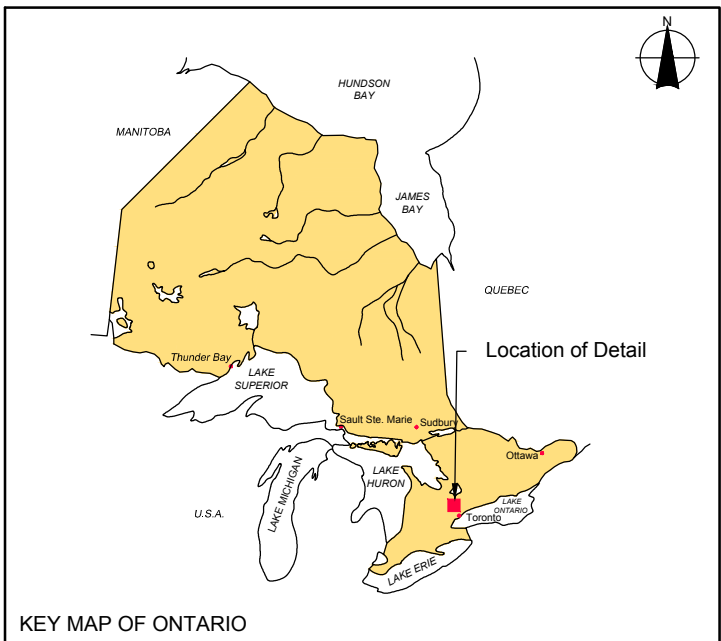
1.5 Description of the Preferred Alternative

The preferred alternative is a Two-Lane Reconstruction of The Gore Road. A detailed description of the preferred alternative is provided in Section 6.0 and features:

- basic two-lane pavement;
- new asphalt pavement;
- improved road shoulders and drainage; and,
- improved driver sightlines.



Map Reference:
Map Art Publishing
Ontario Road Atlas





KEY MAP OF ONTARIO

FIGURE 1.1 - SITE LOCATION MAP

REGION OF PEEL
TOWN OF CALEDON

THE GORE ROAD PROJECT
FILE REPORT

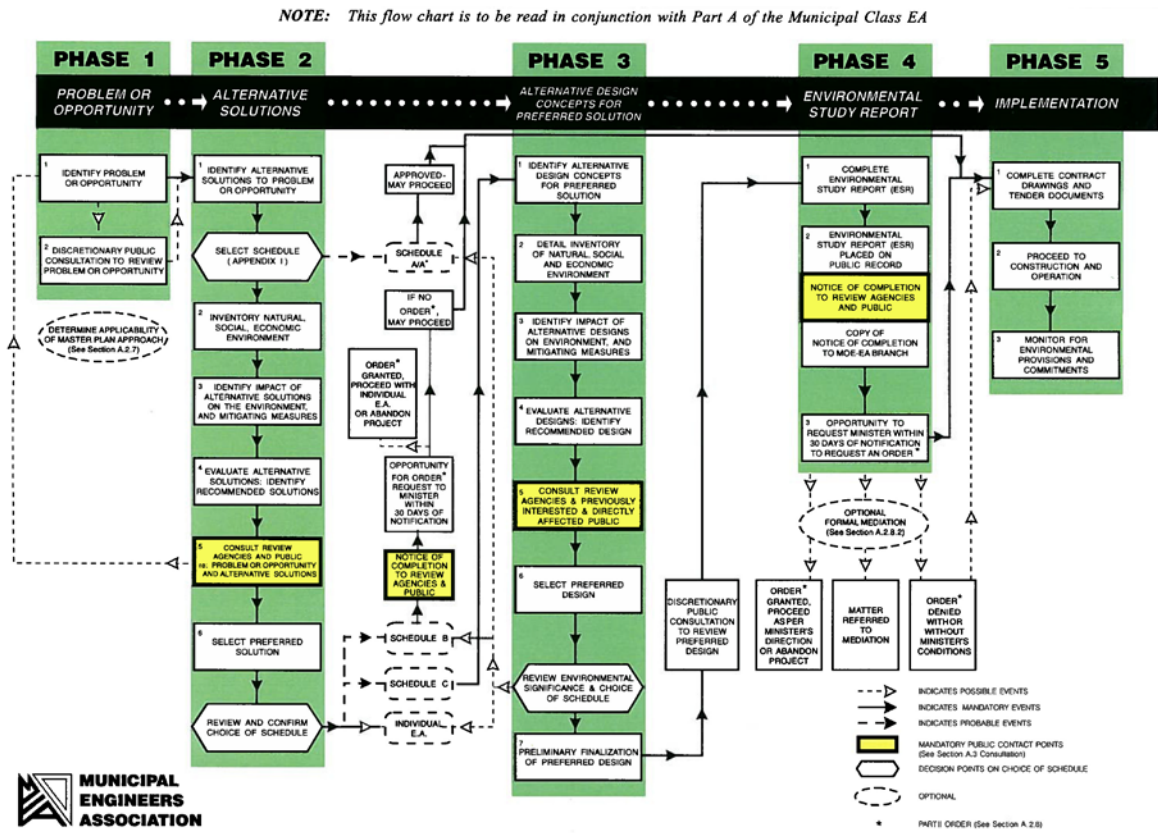
July 2013
Project Number: MTB019424
Prepared by: Z. Nevar Verified by: D. Evans

019424 SL.dwg

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

Figure 1.2 Municipal Class EA Process



(Source: MEA, 2000, as amended 2007 and 2011)

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

2.0 Alternative Solutions

In order to address the problem/opportunity statement identified in Section 1.1, the following alternative solutions have been proposed:

Do Nothing: This alternative was included to provide a base to which the other alternatives can be compared. Under this alternative, no measures to improve The Gore Road are considered.

Repave Existing Two Lanes: This alternative addresses the current pavement distress, otherwise, The Gore Road corridor remains unchanged.

Two-lane Full Reconstruction: This alternative provides the opportunity to improve the vertical / horizontal alignment of The Gore Road, improve shoulder areas and drainage, and initiate a pilot program for active transportation alternatives.

The evaluation of the alternative solutions is provided in Section 5.0.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

3.0 Road/Traffic Network

3.1 Background

Currently the pavement and structural integrity on The Gore Road between Patterson Sideroad and Highway 9 have reached their end of life and require reconstruction. In addition, other roadside elements such as sub-standard road base and shoulders, road drainage issues and visibility restrictions throughout the road's rolling terrain require upgrading to current day standards. In reconstructing The Gore Road, there is an opportunity to focus on geometric design options and other roadway features to address the travel needs of the roadway users over the next 20 years. Further, there is the opportunity to maintain the Regional Road's rural character without compromising the area's existing features.

3.2 Existing Conditions

The Gore Road is designated as a north-south Regional arterial road connecting Highway 9 in the north with Highway 50 in the south of Peel Region and providing access to existing residential and farm properties. Trucks are prohibited on this section of The Gore Road except for local deliveries. Within the area under study between Patterson Sideroad and Highway 9 in the northeast quadrant of the Region of Peel, The Gore Road is characterized as a two-lane, rural roadway with open ditches, narrow gravel shoulders and rolling terrain. At Highway 9, The Gore Road motorists are controlled with a stop sign. Patterson Sideroad, Finnerty Sideroad North and South and Coolihans Sideroad, which are under the jurisdiction of the Town of Caledon, intersect The Gore Road and their movements are controlled with stop signs. The posted speed limit on this section of The Gore Road between Patterson Sideroad and Highway 9 is 70 km/h. There are no turn lanes or traffic signals along the roadway in the study area.

3.3 Existing Traffic Demands

Figure 3.1 portrays the 2010 a.m. and p.m. existing traffic volumes as surveyed by the Region in March 2010. An analysis of intersection operation involving road capacity and level of service analysis including warrants for traffic control signals was undertaken to support the need for any immediate improvements.

Table 3.1 outlines the existing intersection conditions at the five The Gore Road intersections within the study area including the average delay, level of service (LOS), volume/capacity ratio (V/C) for each intersection as well as the critical movement.

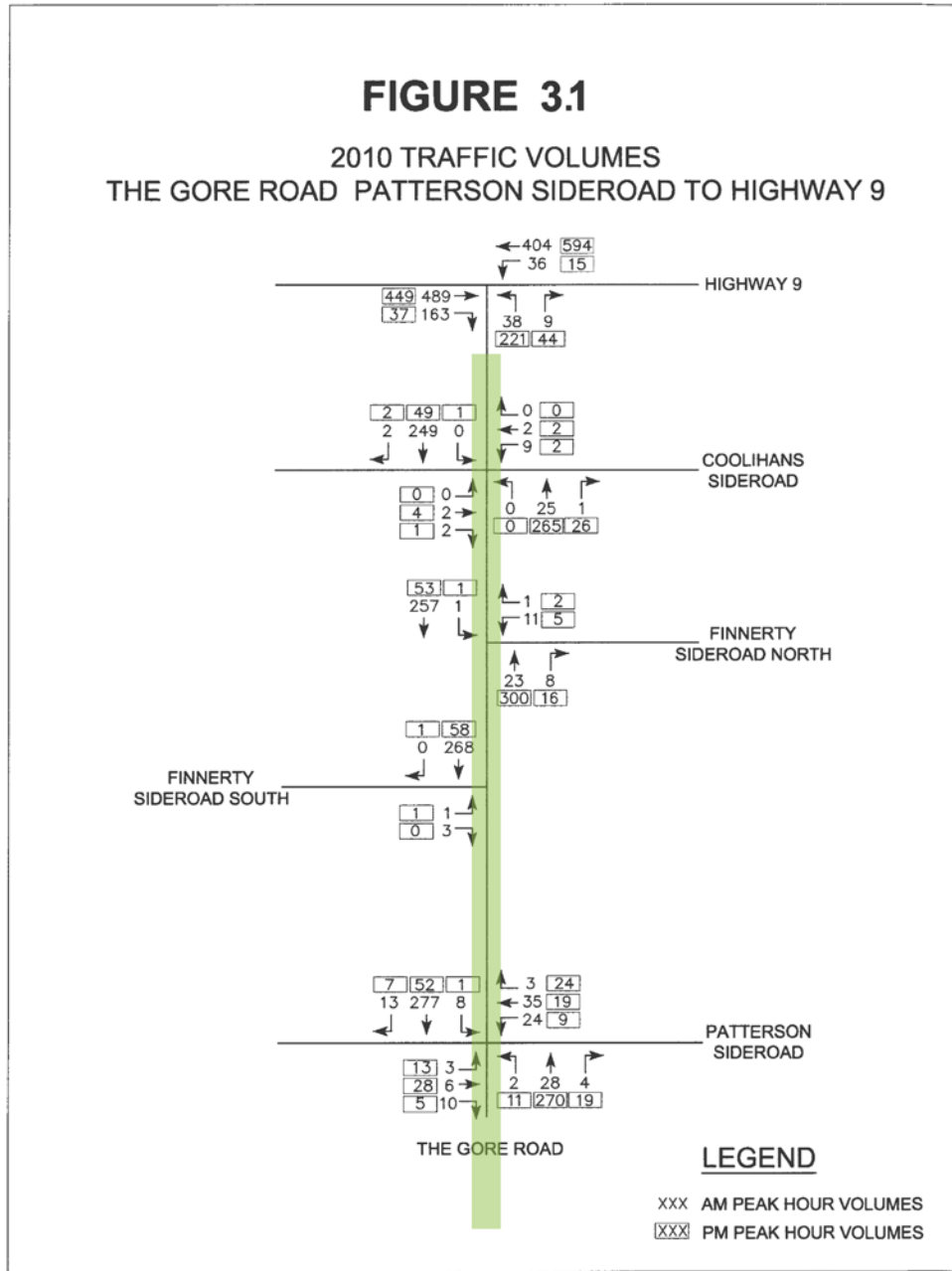
To provide some meaning and comparison for this data, Table 3.2 portrays the LOS criteria for un-signalized intersections. The highest possible rating is LOS 'A' under

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

which the average delay is equal to or less than ten seconds per vehicle. LOS 'E' is the point at which remedial measures are usually considered, depending on the nature and extent of delays. However, LOS 'E' is often acceptable for left turn traffic at intersections. When the average delay exceeds 50 seconds at un-signalized intersections, the movement is classed LOS 'F' and remedial measures are usually implemented, if feasible. In this case, the existing overall a.m./p.m. peak hour LOS at all intersecting roads is in the upper end of the acceptable range with reserve capacity available. The one critical movement is in the p.m. peak hour northbound at Highway 9 and The Gore Road where the LOS was F and the V/C ratio 1.11.

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

Figure 3.1 Gore Road 2010 Existing AM/PM Peak Hour Traffic Volumes



W:\kpridham\MTB019424 Traffic Volume Figures 1-2-3.dwg
 Jan 05, 2011 - 12:15pm

Level of Service (LOS) for study corridor shows sufficient capacity (no road widening or additional turning lanes required).

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

Based on traffic signal warrant analysis, traffic signals are not warranted at this time at the Highway 9/The Gore Road intersection. However, it is anticipated that the volume growth and delays will necessitate the replacement of the existing stop control at The Gore Road/Highway 9 intersection with traffic signal control within the planning horizon of this study. The intersection of Highway 9 and The Gore Road is under the jurisdiction of the Ministry of Transportation (MTO). MTO are currently conducting an EA in this area and their preliminary plans at this time calls for the future signalization of Highway 9/The Gore Road intersection together with minor road widening to accommodate left turn lands on Highway 9 and a northbound right/left turn lane on The Gore Road at Highway 9 as well as the closure of the Coolihans Sideroad intersection at Highway 9.

Table 3.1 Existing 2010 Intersection Performance

Intersection	Intersection Performance					
	AM Peak Hour			PM Peak Hour		
	LOS	Average Delay Seconds	V/C	LOS	Average Delay Seconds	V/C
The Gore Road/Patterson Sideroad						
Intersection	A	2.5	0.1	A	3.0	0.03
Critical Movement	-	-	-	-	-	-
The Gore Road/Finnerty Sideroad South						
Intersection	A	0.1	0.16	A	0	0.03
Critical Movement	-	-	-	-	-	-
The Gore Road/Finnerty Sideroad North						
Intersection	A	0.4	0.02	A	0.2	0.19
Critical Movement	-	-	-	-	-	-
The Gore Road/Coolihans Sideroad						
Intersection	A	0.5	0.02	A	0.3	0.01
Critical Movement	-	-	-	-	-	-
The Gore Road/Highway 9						
Intersection	B	1.4	0.2	C	26.7	1.11
Critical Movement NB	-	-	-	F	136	1.11

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

Table 3.2 Level of Service¹ Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (Seconds/Vehicle)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

¹ Source – Highway Capacity Manual 2000

3.4 Safety Review

The Region of Peel staff completed an In Service Safety Review of The Gore Road between Patterson Sideroad and Highway 9 in August, 2010 (Appendix A1). This review was undertaken to examine The Gore Road's safety performance and to identify engineering related factors and opportunities. The following summarizes the major findings:

- There were a total of 41 reportable collisions on The Gore Road between Patterson Sideroad and Highway 9 between 2005 and 2009. Of the total only two reportable collisions resulted in injuries.
- Twenty-three collisions (56.1%) involved single motor vehicle and animals; 11 collisions (26.8%) classed as "other"; four collisions (9.8%) angle type; and three collisions (7.3%) classed as rear end / sideswipe.
- Twenty-eight collisions (68.3%) occurred under dry road conditions; four collisions (9.7%) occurred under snow, slush or icy roads; and nine collisions (22%) occurred under wet road conditions.

An onsite review shed potential light on contributing elements to the collision history within The Gore Road study area. The items which have been identified for review and potential upgrading as feasible are:

- Add advance street name signs for northbound motorists on the south leg of The Gore Road/Finnerty Sideroad South; for westbound motorists on the east approach leg of Patterson Sideroad/The Gore Road; and for eastbound and westbound motorists on Finnerty Sideroad approaching The Gore Road.
- Object marker signs are missing for the guide rails on the east leg of Patterson Sideroad 150 m from The Gore Road.
- Posted speed limit signs on Coolihans Sideroad and Finnerty Sideroad are missing.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

- The advance "Stop Sign Ahead" sign on Finnerty Sideroad North approaching The Gore Road is concealed in foliage.
- Increase the size of the intersecting street name signs.
- The need for upgrading the guide rail protection is to be reviewed together with the requirement of chevrons, longitudinal rumble strips and raised reflective markers.
- The need to review the sightline distances with a view to assessing the horizontal and vertical road alignment for possible changes where reasonable.
- Additional deer crossing signs northbound and southbound downstream of the Finnerty Sideroad together with consideration of deer fencing to reduce vehicle/animal collisions.
- Review of sight lines at private driveways.

The items for review have been circulated to the appropriate responsible parties for action.

In 2009, the MNR Aurora District compiled a report entitled "White-tailed Deer Motor Vehicle Collisions, Town of Caledon, January 2001 to December 2007" (see Appendix A2) which briefly summarizes general recommendations for consideration in dealing with awareness, prevention and management of deer-motor vehicle collisions (DMVC) in high risk areas within the Town of Caledon.

The following highlight the key points from this report that are pertinent to The Gore Road Improvements study area:

- Deer-vehicle collision data was collected from the Caledon Ontario Provincial Police (OPP) during a seven-year span from January 2001 to December 2007.
- Frequency data was digitized and plotted on a map of the Town of Caledon to show approximate locations of collisions as points at the nearest intersection to the occurrence. This map is provided as Figure 1 in the MNR Report (see Appendix A2).
- Collision clusters were found to occur at the intersection of Airport Road and Charleston Side Road (39 collisions) and at Old Church Road and The Gore Road (36 collisions). High collision rates at these locations may be related to the high traffic volume on these roads, and the surrounding habitat in these locations that typically attract deer to the roadside (forest, agricultural fields, creek corridors).
- A desktop analysis of annual and monthly totals for deer-vehicle collisions over the seven-year time span found that the month of November had the greatest frequency of reported collisions; the month of July had the least number of reported collisions. Late fall to December coincides with higher deer activity in the form of deer breeding season, migration from summer to winter range, and deer seeking high energy food sources for winter.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

- The majority of collisions occurred during low light conditions between dusk and dawn. These conditions create poor visibility for drivers and coincides with the time of day when deer tend to be more active.
- Deer populations fluctuate over time based on a number of factors that may affect their breeding and feeding patterns: drought, colder air temperatures, or other environmental conditions. This may account for the variations in annual and monthly totals of deer motor vehicle collisions.
- There appears to be a trend in Southern Ontario of increasing deer populations in recent years. There is a strong correlation between the number of deer-motor vehicle accidents and the density of the deer population in an area. In light of this reality, some management approaches to improve driver safety and awareness are being considered in road ecology, such as improved size and hazard lighting deer crossing signage, exclusion fencing, wildlife crossings, roadside lighting, and maximizing hunting opportunities, to name a few.
- For high risk areas, planning and design of road reconstruction projects should incorporate wildlife crossings and exclusion fencing. Continued deer collision reporting and tracking is also recommended in order to monitor the frequency and trends in deer-vehicle collisions.

3.5 Future Traffic Conditions

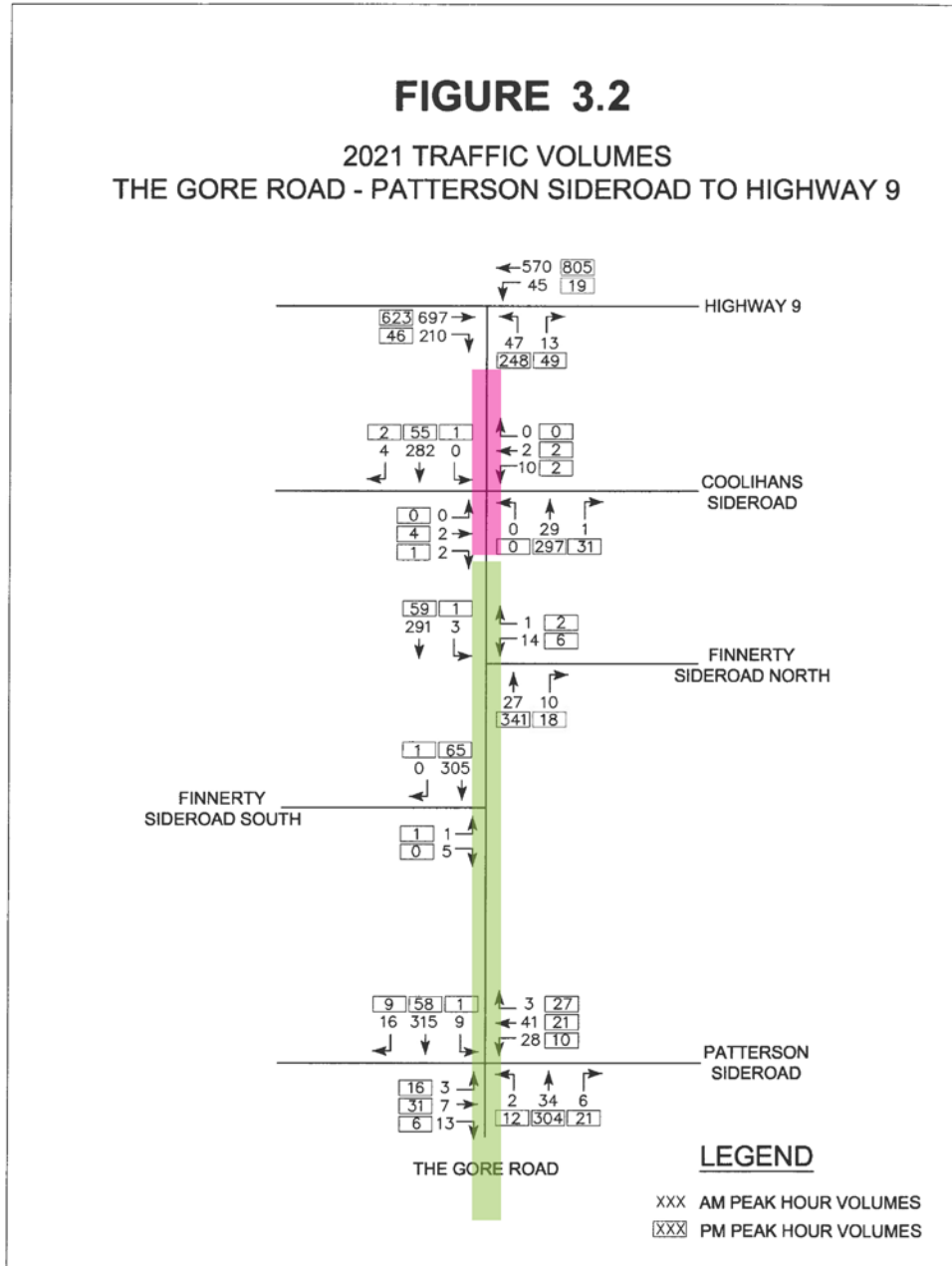
The Region of Peel staff provided the 2021 and 2031 horizon year traffic volumes which are illustrated in Figures 3.2 and 3.3 respectively. Overall, the projected traffic volumes on The Gore Road over the planning period support the retention of a two-lane basic pavement design. Tables 3.3 and 3.4 present the intersection analysis results for 2021 and 2031 operations.

Overall, the only operational problem occurs on the northbound leg of The Gore Road/Highway 9 intersection where motorists will face an unacceptable level of service without improvements over the planning period.

Table 3.5 portrays the intersection performance of The Gore Road/Highway 9 intersection if the stop control were converted to traffic signal control. Signalizing this intersection will provide an overall LOS 'C' or better.

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

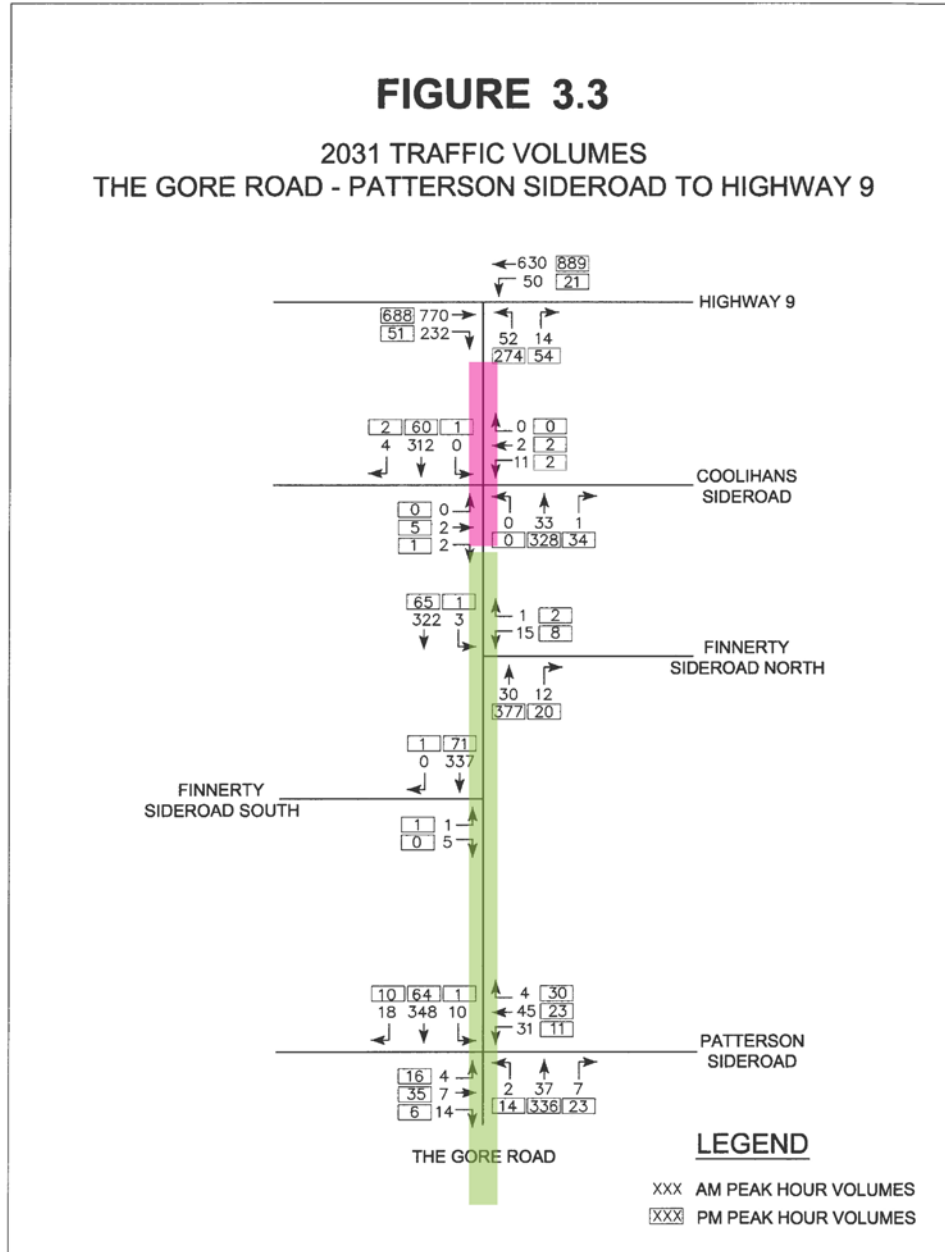
Figure 3.2 2021 Traffic Volumes The Gore Road – Patterson Sideroad to Highway 9



W:\kpridham\MTB019424 Traffic Volume Figures 1-2-3.dwg
 Jan 05, 2011 - 12:15pm

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

Figure 3.3 2031 Traffic Volumes – The Gore Road – Patterson Sideroad to Highway 9



W:\kpridhom\MTB019424 Traffic Volume Figures 1-2-3.dwg
 Jan 05, 2011 - 12:15pm

- Level of Service (LOS) for study corridor shows sufficient capacity deficiency/excessive delays that would be resolved with a traffic control signal at Highway 9 and The Gore Road..
- Level of Service (LOS) for study corridor shows sufficient capacity (no road widening or additional turning lanes required).

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

Table 3.3 2021 Intersection Performance

Intersection	Intersection Performance					
	AM Peak Hour			PM Peak Hour		
	LOS	Average Delay Seconds	V/C	LOS	Average Delay Seconds	V/C
The Gore Road / Patterson Sideroad						
Intersection	A	2.6	0.13	A	2.9	0.04
Critical Movement	–	–	–	–	–	–
The Gore Road / Finnerty Sideroad South						
Intersection	A	0.2	0.18	A	0	0.04
Critical Movement	–	–	–	–	–	–
The Gore Road / Finnerty Sideroad North						
Intersection	A	0.5	0.02	A	0.2	0.21
Critical Movement	–	–	–	–	–	–
The Gore Road / Coolihans Sideroad						
Intersection	A	0.5	0.02	A	0.3	0.01
Critical Movement	–	–	–	–	–	–
The Gore Road / Highway 9						
Intersection	C	2.7	0.47	D	105.6	2.24
Critical Movement NB	F	55.8	0.47	F	635	2.24

Table 3.4 2031 Intersection Performance

Intersection	Intersection Performance					
	AM Peak Hour			PM Peak Hour		
	LOS	Average Delay Seconds	V/C	LOS	Average Delay Seconds	V/C
The Gore Road / Patterson Sideroad						
Intersection	A	2.8	0.1	A	2.9	0.11
Critical Movement	–	–	–	–	–	–
The Gore Road / Finnerty Sideroad South						
Intersection	A	0.2	0.2	A	0	0.04
Critical Movement	–	–	–	–	–	–
The Gore Road / Finnerty Sideroad North						
Intersection	A	0.5	0.02	A	0.2	0.23
Critical Movement	–	–	–	–	–	–
The Gore Road / Coolihans Sideroad						
Intersection	A	0.5	0.02	A	0.3	0.01
Critical Movement	–	–	–	–	–	–
The Gore Road / Highway 9						
Intersection	D	4.3	0.66	E	1659	3.13
Critical Movement NB	F	93.5	0.66	F	Excessive	3.13

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

Table 3.5 Intersection Performance The Gore Road/Highway 9 Intersection with Traffic Signal Control

Year	Intersection Performance					
	AM Peak Hour			PM Peak Hour		
	LOS	Average Delay Seconds	V/C	LOS	Average Delay Seconds	V/C
2021						
Intersection	C	20.5	0.54	C	22.4	0.78
Critical Movements	–	–	–	–	–	–
2031						
Intersection	B	18.6	0.60	C	25.9	0.86
Critical Movements	–	–	–	–	–	–

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

4.0 Description of the Environment

Descriptions of the various components of the natural environment are provided in the following sections.

4.1 Land Use

4.1.1 Region of Peel's Official Plan

According to Schedule A of the Region of Peel's Official Plan (RPOP) (2005), the lands adjacent to The Gore Road are zoned as Natural Core Areas. Schedule D identifies the lands surrounding The Gore Road as an Urban System (Schedule D). Section 2.3.2 addresses these designations:

"2.3.2.5 Prohibit development and site alterations within the Core Areas of the Greenlands System in Peel, except for:

- a) development permitted within approved Two Zone and/or Special Policy Areas for Flood Plains as outlined in provincial policy;*
- b) minor development, minor site alterations and passive recreation;*
- c) essential servicing;*
- d) works for conservation purposes; and*
- e) compatible recreation within the Urban System, as shown on Schedule D."*

The Gore Road is classed as a Major Road (Schedule E) with a 30 m right-of-way (ROW) (Schedule F). Based on section 5.6.4 of the RPOP improvements made to public infrastructure are generally consistent with permitted uses of the adjacent land use designations.

"5.6.4.1 Objectives

5.6.4.1.1 To have a reliable and efficient Major Road Network to enhance the safe movement of people and goods."

"5.6.4.2 Policy

5.6.4.2.9 Notwithstanding the right-of-way widths identified on Schedule F, ensure that future road widenings within the Niagara Escarpment Plan Area are consistent with the policies of the Niagara Escarpment Plan."

4.1.2 Town of Caledon's Official Plan

According to Schedule A of the Town of Caledon's Official Plan (TCOP) (2005), the lands adjacent to The Gore Road are zoned as combination of Environmental Policy

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

Area and Rural Area. Section 5.2 addresses the Rural Area designation and there is no direct reference to enhancement of existing infrastructure. Section 5.7.3 addresses the Environmental Policy Area designations:

“5.7.3.1.2 The uses permitted in EPA shall be limited to: legally existing residential and agricultural uses; a building permit on vacant existing lot of record; portions of new lots. Activities permitted through approved Forest Management and Environmental Management Plans; limited extractive industrial; non-intensive recreation; and, essential infrastructure. “

The Gore Road is classed as a Medium Capacity Arterial Road (Schedule J) with a 30 m right-of-way (ROW) (Schedule K). Section 5.9 addresses Transportation classifications:

“5.9.3.4 The Town will coordinate local road improvements, as appropriate, with the Region and the Province, and will encourage these authorities to maintain and improve roads within Caledon, as appropriate.”

Based on the TCOP, improvements made to public infrastructure are generally consistent with permitted uses of the adjacent land use designations.

4.1.3 Greenbelt Plan

The Gore Road is located within the ‘Oak Ridges Moraine’ designation within the Greenbelt Plan (2005).

4.1.4 Oak Ridges Moraine Conservation Plan

The Gore Road is located within the ‘Natural Core Areas’ designation within the Oak Ridges Moraine Conservation Plan (2001) (ORMCP). This designation comprises 38% of the moraine. The ORMCP states:

“Natural Core Areas protect those lands with the greatest concentrations of key natural heritage features which are critical to maintaining the integrity of the Moraine as a whole. Only existing uses and very restricted new resource management, agricultural, low intensity recreational, home businesses, transportation and utility uses are allowed in these areas.

New transportation and utility corridors or facilities shall only be allowed in Natural Core Areas and Natural Linkage Areas if they are shown to be necessary and there is no reasonable alternative. They shall also have to meet stringent review and approval standards.”

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

As such, improvements made to public infrastructure, including improvements to The Gore Road are consistent with the ORMCP.

4.1.5 Provincial Policy Statement

The 2005 Provincial Policy Statement (PPS) states that municipal projects should be directed to existing settlement areas, create stronger and improved communities, and have little to no impact on the natural features of the area. In general projects should have consideration for future needs to ensure the benefits of the project are far-reaching. Section 1.6 of the PPS contains specific guidance on Infrastructure and Public Service Facilities:

“1.6.1 Infrastructure and public services facilities shall be provided in a coordinated, efficient and cost-effective manner to accommodate projected needs.

Planning for infrastructure and public service facilities shall be integrated with planning for growth so that these are available to meet current and projected needs.

1.6.2 The use of existing infrastructure and public service facilities should be optimized wherever feasible, before consideration is given to developing new infrastructure and public services facilities.”

As such, improvements made to public infrastructure, including improvements to The Gore Road are consistent with the PPS.

4.2 Terrestrial Environment

A desktop review of the terrestrial environment of the study area was completed, the results are as follows.

4.2.1 Designated Areas

A review of the Natural Heritage Information Centre (“NHIC”) database identified the Caledon Hills Complex natural area within the study area, or in the vicinity of the study area. The Caledon Hill Complex is a Life Science Site that consists of a large tract of land located north of Caledon East. The site stretches from Airport Road to east of the 5th Line and south of Sideroad 35 to south of Sideroad 25. The NHIC identifies it as the largest complex in the Toronto and Region Conservation Authority (TRCA) area. The area is marked with a large number of wetlands and is considered a significant source area for the Humber River watershed.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

4.2.2 Designated Species

The review of the NHIC database identified a record of the Northern Map Turtle (*Graptemys geographica*) from 1993. This species is ranked S3, meaning that it is 'Vulnerable' in the province.

4.2.3 Tree Inventory

About & Associates completed a tree Inventory in the August 2011. Species lists and mapping are provided in Appendix B. One designated species, Butternut (*Juglans cinerea*) (E156) was identified south of Coolihans Sideroad on the east side of The Gore Road approximately 14 m from the centre line (see Figure in Appendix B). A Butternut Health Assessment was completed and the tree was determined to be non-retainable and in poor health.

4.2.4 Vegetation Communities

The study area is comprised of a rural and agricultural landscape, interspersed with woodlots, a number of watercourses and natural areas. A site reconnaissance was undertaken on June 17 and July 20, 2011. Ecological Land Classification (ELC) of the study area was completed based on Lee et. al (1998), where 33 vegetation and cultural communities were identified in the study area. The ELC evaluation was completed from the ROW, and no soils data was collected. TRCA supplied ELC data and mapping for the study area, and Burnside staff confirmed or modified the data accordingly.

A summary of the ELC units identified within the study area is provided below and delineated on Figures 4.1A to 4.1D.

Open Water

Any areas of open water that were distinguishable on the 1:5000 air photo were classed as open water. Since these areas are set back from the road corridor, a full evaluation of these areas was not completed and an ELC was not applied.

Cultural Community, CU

Active farm fields, residential properties, horse paddocks and other managed lands are not categorized within the ELC manual, and thus are classified as cultural sites. Due to the fact that these areas are highly influenced by human activity, any proposed road works in these areas would result in limited environmental impacts.

Dry-Moist Old Field Meadow Type, CUM1-1

Fallow fields provide the most common occurrence of CUM1-1 communities. These communities are primarily characterized by common meadow species including

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

goldenrods (*Solidago* sp.), common milkweed (*Asclepias syriaca*), vetch (*Vicia* sp.), Queen Anne's lace (*Daucus carota*), thistles and curled dock (*Rumex crispus*).

Mixed Plantation Ecosite, CUP2

The TRCA identified two mixed plantations along the west side (southwest) of The Gore Road between Patterson Sideroad and Finnerty Sideroad. Burnside staff confirmed these communities during the June 17, 2011 site investigation.

A young plantation of Scots pine (*Pinus sylvestris*) and Black locust (*Robinia pseudoacacia*) also contained lesser amounts of white ash (*Fraxinus americana*) and woodland blue grass (*Poa sylvestris*).

A second young plantation containing Carolina poplar (*Populus x canadensis*), White spruce (*Picea glauca*), Eastern white cedar (*Thuja occidentalis*), Jack pine (*Pinus banksina*) and Scots pine was located slightly farther to the north along The Gore Road.

Red Pine Coniferous Plantation Type, CUP3-1

There were a large number of plantations located within the study area. Some Red pine (*Pinus resinosa*) plantations occurred alongside the White pine (*Pinus strobus*) and Scots pine plantations, as well there were some instances where all three species were planted in individual rows creating a coniferous plantation with an ELC community identified as CUP3 (Coniferous Plantation Ecosite). All four plantation types appear to be similar in age and planted during the same time period. They also appear to be in good health and have been regularly managed (thinning and pruning). Some of the plantations appeared to be part of the Ministry of Natural Resources, Managed Forest Tax Incentive Program (MFTIP).

White Pine Coniferous Plantation Type, CUP3-2

As described above, there were fewer occurrences of pure White pine plantations throughout the study area.

Scots Pine Coniferous Plantation Type, CUP3-3

The Scots pine communities were equally as common as the Red pine plantations, making them the dominant forms throughout the northern reaches of the study area (north of Finnerty Sideroad).

Mineral Cultural Savannah Ecosite, CUS1

The TRCA identified three small areas within the eastern (northeast) limits of the study area that cannot be classified any further than the Ecosite level. They considered the areas to be a native successional savannah. These areas were dominated by White ash, American elm (*Ulmus americana*), Sugar maple (*Acer saccharum* ssp. *Saccharum*) and American basswood (*Tilia americana*), but were not densely populated.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

Mineral Cultural Thicket Ecosite, CUT1

The TRCA noted a single occurrence of an area of eastern white cedar and Scots pine regenerating in an old meadow site. This has created a thicket Ecosite that is transitioning into a forest. The meadow like ground cover consisted of Canada blue grass (*Poa compressa*), Drooping wood sedge (*Carex arctata*) and Grey goldenrod (*Solidago nemoralis* spp. *nemoralis*).

Sumac Cultural Thicket Type, CUT1-1

Another single polygon was noted as being a thicket by the TRCA. The community was completely dominated with Staghorn sumac (*Rhus typhina*) while the ground cover consisted of Tall goldenrod (*Solidago altissima* var *altissima*), Canada blue grass and Grey goldenrod.

Mineral Cultural Woodland Ecosite, CUW1

Although the TRCA will typically work through the ELC to determine a vegetation type, this is not always possible. There are two instances where a CUW1 classification was the most feasible; an area in the southwest where there was a former homestead that has been abandoned; and, an area in the north, bordering Coolihans Sideroad, surrounding a pond. Both of these areas contained between 35% and 60% tree cover.

Dry-Fresh White Cedar Coniferous Forest Type, FOC2-2

Burnside staff identified two areas of FOC2-2 within the study area. Both areas were dominated by Eastern white cedar with lesser amounts of White ash, Sugar maple, and Common buckthorn (*Rhamnus cathartica*). These areas occurred on mid to upper slopes.

Fresh-Moist White Cedar Coniferous Forest Type, FOC4-1

Six areas of FOC4-1 were identified by TRCA and Burnside staff. This community was common in low-lying areas in and around watercourses. These communities were almost purely Eastern white cedar with little to no understory due to the dense canopy cover.

Dry-Fresh Poplar Deciduous Forest Type, FOD3-1

TRCA and Burnside staff identified two areas within the study area that were mostly poplar. Dominant species in both areas included Trembling aspen (*Populus tremuloides*), Balsam poplar (*Populus balsamifera*), and White birch (*Betula papyrifera*). Species found in the understory included American witch-hazel (*Hamamelis virginiana*), White cedar, and American beech (*Fagus grandifolia*).

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

Dry-Fresh Deciduous Forest Ecosite, FOD4

A single occurrence of a mid-aged Norway maple (*Acer platanoides*) stand was noted by the TRCA and was located in the south on the east side of The Gore Road. There was limited White ash and no notable ground cover within the stand.

Dry-Fresh Sugar Maple – Beech Deciduous Forest Type, FOD5-2

The TRCA noted that this community, located on the east side of the study area was mostly sugar maple, with less but still notable amounts of beech and American basswood.

Dry-Fresh Sugar Maple-White Ash Deciduous Forest Type, FOD5-8

These two mid-aged stands were dominated by Sugar maple and White ash, with Black cherry also noted. The TRCA noted limited ground cover (10 to 25%) of evergreen wood fern (*Dryopteris intermedia*) and Canada enchanter nightshade (*Circaea lutetiana*)

Dry-Fresh Sugar Maple – White Birch – Poplar Deciduous Forest Type, FOD5-10

This community was identified to the west of The Gore Road. It bordered on a swamp to the south and a residence to the north. White birch, Sugar maple and Poplar were the dominant canopy species, along with White ash.

Fresh-Moist Sugar Maple – Lowland Ash Deciduous Forest Type, FOD6-1

White ash and Sugar maple were the dominant forms in the canopy and sub canopy of this single polygon. The TRCA noted that there were a number of different ash species, making identification of additional ash species difficult.

Fresh-Moist Willow Lowland Deciduous Forest Type, FOD7-3

Burnside identified these two areas and found them to be around open water in the southern limits of the study area. Willow (*Salix sp.*), maples and ash were the most prevalent species, with Eastern white cedar also appearing frequently.

Fresh-Moist Poplar Deciduous Forest Type, FOD8-1

Eight occurrences of this community were identified throughout the study area and was considered a common vegetation type. Trembling aspen was the dominant species through all eight areas. TRCA and Burnside also identified White ash, Black cherry and elm occurring in these communities.

Dry-Fresh Sugar Maple – Hemlock Mixed Forest Type, FOM3-2

TRCA identified single occurrence of this mixed forest type in the southern portion of the study area. Although a very small area of this habitat occurs within the study area, this community extend far beyond the study limits. Sugar maple was noted as being more

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

abundant than the Eastern hemlock (*Tsuga canadensis*). The sub canopy contained a large amount of Eastern hemlock and lesser amounts of Sugar maple.

Dry-Fresh White Cedar – Poplar Mixed Forest Type, FOM4-2

Burnside and TRCA identified a total of six areas of mixed eastern white cedar and trembling aspen vegetation communities. Trembling aspen was considered to far outweigh the amount of cedar. However, using the guideline, set out in the ELC manual, of a minimum of 25% coniferous cover in a hardwood stand, these communities were considered to be mixed vegetation types.

Fresh-Moist White Cedar – Hardwood Mixed Forest Type, FOM7-2

White ash, Black cherry and White birch made up the required 25% to make these eastern white cedar stands classify as a mixed forest. TRCA and Burnside staff identified a total of six of these mid-aged communities.

Reed-canary Grass Mineral Meadow Marsh Type, MAM2-2

Burnside staff identified two areas of meadow marsh that were dominated by Reed canary grass (*Phalaris arundinacea*). These marshes appear to be supported by seasonal flooding.

Cattail Mineral Shallow Marsh Type, MAS2-1

TRCA and Burnside staff identified a number of common cattail (*Typha latifolia*) marsh areas throughout the study area. These communities were often associated with seasonally flooded meadow marshes and low lying depressions. Sensitive fern (*Onoclea sensibilis*) and willow species were common throughout these areas.

Shrub Sand Barren Ecosite, SBS1

The TRCA noted this community directly alongside the western side of The Gore Road in the southern end of the study area. This area contained less than 25% Eastern white cedar and approximately 50% Canada blue grass. Due to the rare occurrence of shrub sand barrens within the area, this community is considered to be significant.

White Cedar Mineral Coniferous Swamp Type, SWC1-1

The TRCA noted that this single site was dominated by Eastern White cedar, with very limited Yellow birch (*Betula alleghaniensis*) and various ferns. The soils were completely saturated during the site reconnaissance.

White Cedar Organic Coniferous Swamp Type, SWC3-1

Trembling aspen was the only other canopy species noted during the TRCA's assessment of this single vegetation area. This swamp contained Eastern white cedar in the canopy, sub canopy and even as the ground layer. The ground layer also contained sensitive fern and Spotted jewel-weed (*Impatiens capensis*).

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

White Cedar-Conifer Organic Coniferous Swamp Type, SWC3-2

Eastern white cedar, Hemlock, Tamarack (*Larix laricina*) and Yellow birch were found in this single vegetation community. The TRCA noted that this mature community contained a large number of ferns and grasses.

White Birch – Poplar Mineral Deciduous Swamp Type, SWD4-3

There were a number of species noted by the TRCA in this single vegetation community. White birch, Trembling aspen, American elm, and Black ash (*Fraxinus nigra*) made up the majority of the canopy and sub canopy while sensitive fern and sedges formed the ground cover.

White Cedar – Harwood Mineral Mixed Swamp Type, SWM1-1

Eastern white cedar, trembling aspen, yellow birch and black ash were all of note in the two White Cedar - Harwood Mixed Swamp polygons. The TRCA noted Spotted jewel-weed, sensitive fern and Goldenrod in the young to mid-aged communities.

White Cedar – Hardwood Organic Mixed Swamp Type, SWM4-1

This single polygon contained Eastern white cedar, Trembling aspen, Yellow and White birch and Black ash in the canopy and sub canopy layers. Red osier dogwood and ferns were identified in the shrub layer and ground cover. The TRCA conducted soil samples and noted that the organic layer exceeded the 100 cm limit of their auger.

4.2.5 Wildlife and Wildlife Habitat

The Ontario Breeding Bird Atlas (OBBA) was reviewed. 138 species were identified (OBBA squares 17NJ86 and 17NJ96), of which ten are ranked S5, Common and Demonstrably Secure; four are ranked S4, Apparently Secure; two are ranked S4S5, Secure-Apparently Secure; one is ranked S4S5, SZN, Secure-Apparently Secure migrant/vagrant; three are ranked S3B, SZN, Vulnerable migrant/vagrant; one is ranked S1, Critically Imperilled; four are ranked SE, Exotic or not believed to be a native component of Ontario's fauna; 83 are ranked S5B, SZN, Secure migrant/vagrant; and 30 are ranked S4B, SZN, Apparently Secure migrant/vagrant. In addition, 37 species are considered to be area-sensitive, requiring large habitat tracts in which to breed.

Due to the diverse countryside surrounding the study area there is the potential for all 37 area-sensitive breeding birds to be directly within, or adjacent to the study area. The study area is also surrounded by active farm fields, residential properties, and a large quarry operation at the eastern edge of the study area. The following species have the potential to be located within, or adjacent to the study area:

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

Forest Species

- Sharp-shinned Hawk (*Accipiter striatus*);
- Cooper's Hawk (*Accipiter cooperii*);
- Red-shouldered Hawk (*Buteo lineatus*);
- Broad-winged Hawk (*Buteo platypterus*);
- Northern Harrier (*Circus cyaneus*);
- Barred Owl (*Strix varia*);
- Pileated Woodpecker (*Dryocopus pileatus*);
- Hairy Woodpecker (*Picoides villosus*);
- Yellow-bellied Sapsucker (*Sphyrapicus varius*);
- Least Flycatcher (*Empidonax minimus*);
- Yellow-throated Vireo (*Vireo flavifrons*);
- Red-breasted Nuthatch (*Sitta canadensis*);
- White-breasted Nuthatch (*Sitta carolinensis*);
- Brown Creeper (*Certhia americana*);
- Winter Wren (*Troglodytes troglodytes*);
- Veery (*Catharus fuscescens*);
- Hermit Thrush (*Catharus guttatus*);
- Magnolia Warbler (*Dendroica magnolia*);
- Black-throated Blue Warbler (*Dendroica caerulescens*);
- Blackburnian Warbler (*Dendroica fusca*);
- Pine Warbler (*Dendroica pinus*);
- American Redstart (*Setophaga ruticilla*);
- Canada Warbler (*Wilsonia canadensis*); and
- Scarlet Tanager (*Piranga olivacea*).

Grassland Species

- Grasshopper Sparrow (*Ammodramus savannarum*);
- Savannah Sparrow (*Passerculus sandwichensis*);
- Bobolink (*Dolichonyx oryzivorus*);and
- Eastern Meadowlark (*Sturnella magna*)

Marshland and Waterbody Species

- American Bittern (*Botaurus lentiginous*);
- Least Bittern (*Ixobrychus exilis*);
- Common Merganser (*Mergus merganser*);and
- Northern Harrier (*Circus cyaneus*).

A breeding bird survey was completed by North South Environmental in the summer of 2011. A total of 48 bird species were documented from the study area during the surveys (Appendix C). All species noted within the study area were native to Ontario. Of the 48 species documented within the study area, there were 31 probable breeders, 16 possible breeders, and one species (great blue heron) was noted only foraging adjacent to the road; no evidence was found to indicate breeding.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

One species noted within the study area, Bobolink (*Dolichonyx oryzivorus*), is protected (along with its habitat) by the *Endangered Species Act* in Ontario. It is considered federally threatened as designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Additionally, this species is considered threatened within Ontario, as determined by the Ontario Ministry of Natural Resources' (MNR) Committee on the Status of Species at Risk in Ontario (COSSARO).

This bird was documented from a large cultural meadow/pasture on the southwest side of The Gore Road, just southeast of the intersection of The Gore Road and Finnerty Sideroad. Bobolink was only heard calling during the first breeding bird survey. Documentation of a bird twice within the same area at least one week apart is considered evidence of probable breeding. As this species was documented within suitable breeding habitat but only seen once, it was recorded as a possible breeding record. However, this observation should be treated conservatively as a probable breeding record, as Bobolink tend to breed early in the season, and if the singing male had finished breeding by the time the second survey was conducted it would have been less vocal. It was not noted immediately along the road, but was at a distance of approximately 80 m from the road edge. However, this species undoubtedly uses most of the cultural meadow community during nesting as Bobolink are very active during nesting.

4.2.6 Amphibians

Amphibian surveys were conducted on May 25, 2011 at 3 sites across the study area, shown in Figures 4.1A to 4.1D. These stations are associated with the wet features described in Section 4.2.3 (i.e., the SWC1-2, SWM3-2, and MAS2 wetlands). Amphibians were recorded at all of the stations (Culvert #1346, 1347, 1351). Breeding amphibian surveys were conducted according to Environment Canada's Marsh Monitoring Program protocol (Bird Studies Canada, 2003). The locations and timing of these observations are summarized in Table 4.1.

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

Table 4.1 Amphibian Survey Results

Stations	Survey Dates and Species Recorded*
	May 25, 2011
Culvert #1346	Spring Peeper (Code 1-2) and Gray Tree Frog (Code 1-4)
Culvert #1347	Spring Peeper (Code 3)
Culvert#1351	Spring Peeper (Code 1-3)
<p>*numbers in parenthesis refer to the call code and the number of individuals recorded. The first number in the sequence refers to the call codes, which are assigned as follows: Code 1: Calls not simultaneous, number of individuals can be accurately counted. Code 2: Some calls simultaneous, number of individuals can be reliably estimated. Code 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated (too many to count). The second number in the sequence refers to the number of individuals of each species recorded.</p>	

Due to ecological effects of road systems on natural areas and the increased potential for wildlife-vehicle collisions, the TRCA has initiated a Region of Peel Road Ecology Study in order to identify where appropriate mitigation measures will likely minimize impacts of road networks on wildlife movement especially for amphibians associated with wetland and forest habitats. The TRCA has identified The Gore Road between Patterson Sideroad and Finnerty Sideroad as one of the strategic locations in the Peel Urban Road Ecology Study. The Region of Peel has expressed interest in looking at how some mitigation measures can be implemented and will be looking into this further during the detailed design phase of the project. The Region will contact TRCA staff at the start of the detailed design phase to discuss appropriate design and placement (location) of wildlife movement structures. The TRCA has provided a Mitigation and Monitoring Protocol for Wildlife Connectivity along The Gore Road between Patterson Sideroad and Highway 9. A copy of this document is provided in Appendix E.

4.3 Aquatic Environment

Background information available for The Gore Road study area was reviewed with respect to the aquatic conditions within the study area. The documents and/or information sources are provided below:

- Humber River Fisheries Management Plan (DRAFT 2005);
- Natural Heritage Information Center, Ministry of Natural Resources; and
- Aquatic Species at Risk Mapping (DFO 2011), Conservation Ontario/Department of Fisheries and Oceans.

4.3.1 Humber River Watershed

A review of the Humber River Fisheries Management Plan (TRCA, 2005) was completed to determine background conditions relating to the Upper West Humber River. The headwater tributaries of the Humber River flow east under The Gore Road. A total of ten

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

watercourse crossings were determined based on a review of Burnside GIS data and a culvert assessment log (provided by the Region of Peel). Based on The Gore Road Structure and Culvert Inspections Report completed by Burnside in May 2011 (see Appendix L), there are a total of 44 bridge and culvert structures in the study area. Ten culverts convey flow into tributaries of the Upper West Humber River through CSP culverts with one concrete box culvert (No. 082770). All other culverts are associated with driveways and access to adjacent lands.

Culverts nine and ten (identified on Figure 4.1 A) convey flow into tributaries of Palgrave Creek. The Humber River Fisheries Management Plan classifies the watercourses in the study area as “small riverine coldwater” and the main watercourse (Culvert #082770) as “intermediate riverine coldwater” and are generally in good condition. Target species for management in the Upper West Humber River are coldwater species consisting of Brook trout (*Salvelinus fontinalis*), Brown trout (*Salmo trutta*) and Atlantic salmon (*Salmo salar*), with sensitive species consisting of brook trout and mottled sculpin (*Cottus bairdi*). The headwaters of the upper main Humber River are un-impaired but stream health declines downstream due to on-line ponds and increased agricultural activity in floodplain and riparian areas.

The Index of Biotic Integrity (IBI) scores for a station located upstream of the main watercourse crossing The Gore Road from 2000 to 2001 ranked fair (21 to 27).

4.3.2 Natural Heritage

The Ministry of Natural Resources (MNR) Natural Heritage Information Center (NHIC) database was reviewed for Species at Risk in Ontario (SARO) to determine if any designated aquatic species were identified within the study area. No aquatic species occurrences were listed for the study area. MNR was contacted to determine whether or not any aquatic species at risk, listed under the *Endangered Species Act* (i.e., reddsidedace (*Clinostomus elongates*)) were located within the study area. Based on the correspondence provided by MNR dated May 24, 2011 (Appendix D4), two reptile species were identified (Snapping Turtle and Northern Map turtle). No occupied reaches for reddsidedace were identified by MNR.

4.3.3 Aquatic Species at Risk

Maps from Conservation Ontario and Department of Fisheries and Oceans (DFO) were reviewed in the vicinity of the ten culverts along The Gore Road for aquatic Species at Risk (SAR). No aquatic SAR were identified on the mapping within or adjacent to the study area.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

4.3.4 Aquatic Conditions

An Aquatic Conditions assessment of ten culvert crossings was completed to determine the potential for fish habitat, assess available aquatic habitat, potential impacts based on design/construction, and determination of suitable mitigation measures. Ten crossings were inspected for this phase of the project, of which, four (Culvert #1345, 082770, 1352, and 1355) are permanent watercourses with direct fish habitat and six (Culvert # N1, 1346, 1347, 1351, 1353, and 1354) are seasonal providing indirect habitat.

Existing aquatic conditions were determined based on available habitat, morphology, fish presence, surrounding land uses and anthropogenic inputs. The MTO/DFO/OMNR Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings was used to document existing aquatic habitat conditions. No fish sampling was conducted. The watercourse crossings were numbered based on TRCA's identification system (Region of Peel reference numbers in parenthesis).

Crossing #1 (Culvert #1355)

Located at the southern end of the study area, north of Patterson Road, this culvert conveys water west to east under The Gore Road. This watercourse is considered direct fish habitat with permanent flow. The watercourse outlets from an online pond west of The Gore Road with flowing conditions observed during all site visits. Flow is conveyed under The Gore Road via Corrugated Steel Pipe (CSP). The CSP was noted to be a migration barrier based on the elevation of the outlet. The watercourse upstream and downstream of the Gore Road has a defined bed and bank with a mature riparian zone. A seasonal barrier exists on the downstream end of the culvert, although a steep "rocky ramp" may provide upstream access during higher flows. Channel morphology was primarily short riffles with flats and small, low quality pools within a meandering channel. Substrate consisted of sand and gravel with some silt accumulated in areas adjacent to the main flow and in pools. Riparian habitat was characterized by mature white cedar and shrubs downstream of the crossing. Cyprinids were observed during the site visit upstream and downstream of the culvert.

Crossing #2 and 3 (Culvert #1354 and 1353)

Both of these crossings convey water from the west side of The Gore Road. Based on field observations, both crossings are ephemeral and provide in-direct habitat in the form of seasonal water flow to downstream sections. No defined channel was observed although wet soils were present with cattail stands on both sides of The Gore Road at each culvert. Both culverts appeared to be inundated with soil that may cause ponding during high precipitation periods.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

Crossing #4 (Culvert #1352)

This watercourse flows from an on-line pond located on private property west of the Gore Road. Based on field observations this is a permanent watercourse that is direct fish habitat. Cyprinids were observed during field investigations both upstream and downstream of the culvert. Morphology upstream of the culvert is primarily flats with a silty/sand substrate. Downstream of the culvert, a section of large gravel/cobble to dissipate energy from the culvert outlet has been placed. Water in this short section flows through the gravel/cobble and if mitigated may provide better conditions for fish passage. At present a barrier exists at the culvert outlet during low flow conditions. Both banks are stable and no erosion was observed. Good riparian habitat was present upstream and downstream of the culvert offering shade and cover.

Crossing#5 (Culvert #1351)

Based on field observations, this crossing is ephemeral and provides in-direct habitat in the form of seasonal water flow to downstream sections. No defined channel was observed although wet soils were present with cattail stands on both sides of The Gore Road. This crossing conveys water from the west side of The Gore Road that eventually flows into the Upper Humber River.

Crossing#6 (Culvert #082773)

This watercourse is the largest in the study area and most of the drainage features flow into it east of the study area. The crossing structure consists of a large concrete box culvert that conveys flow from west to east under Gore Road. This section of the Upper Humber River has been classified "intermediate riverine coldwater" by the Humber River Fisheries Management Plan (DRAFT 2005) and TRCA. It supports a cold water fish assemblage consisting of brook trout (*Salvelinus fontinalis*), and American brook lamprey (*Lampetra appendix*) based on a review of the TRCA sampling efforts for station HU035WM (HRFMP 2002). The watercourse flows into an on-line pond downstream (east) of The Gore Road. Based on observations made in the field the substrate is characterized by gravel and sand with riffle pool sequences downstream to the on-line pond. Upstream conditions consist primarily of flats with large woody debris and sand and gravel substrate. Riparian habitat is provided by mature white cedar along a slightly meandering channel. A barrier may exist during low flow conditions at the outlet of the culvert (see Appendix F). Baffles were also observed inside the culvert that provides hydraulic breaks in the channel and base of the culvert where substrate would normally get washed through.

Crossing#7 (Culvert #1347)

Crossing #7 conveys water from a small wetland area west of The Gore Road which outlets to the CSP culvert. The watercourse flows east along a marginally defined channel with cattails and grasses. Observations during the site visit confirm this watercourse as ephemeral and dependent on the water levels in the wetland. Fish may

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

be present in the wetland or the channel if water levels are suitable. Substrate consisted of fine grained material on the east side with one large boulder at the outlet of the culvert. The upstream section had a berm across the outlet channel that controlled flow to the culvert from the wetland. The wetland had emergent aquatic species such as cattail, white lily pad, and floating plants such as duckweed (see Appendix F). The watercourse was dry during the July 12, 2011 site visit although the soils at the culvert outlet were wet and minor iron staining was observed. Cattails were present in the channel on the east side of The Gore Road.

Crossing#8 (Culvert #1346)

This CSP culvert conveys flow east of The Gore Road from a wetland area on the west side of the road. This wetland may have been created by the culvert elevation and at present is noted for amphibian breeding habitat. There is no defined channel on the east side of The Gore Road with a large area of cattails present. This watercourse would be classified as ephemeral with in-direct fish habitat that provides a source of water during wet seasons.

Crossing#9 (Culvert N1)

Based on field observations this watercourse has no defined channel and was dry during site visits in May, June and July 2011. A small dug pond located south west of The Gore Road may provide a source of water that flows during extreme wet seasons. The CSP in this location conveys water from the west to the east side of The Gore Road. Vegetative species found in the ditch next to the culvert are primarily grasses and cattails observed on the east side down gradient of the culvert. No direct fish habitat was observed around the culvert.

Crossing#10 (Culvert #1345)

The last culvert crossing in the study area south of Hwy 9 consists of a steel CSP. Observations confirm that permanent fish habitat is present downstream of the culvert with upstream conditions similar to a wetland or seasonally ponded area. Water flows west from wetland type habitat that is bound by The Gore Road where water appears to be held back by the culvert elevation. Downstream of the CSP outlet is a plunge pool created by a perched culvert that is elevated 1.5 m above the water surface. This perched culvert is a barrier to fish movement although maintains the water level in the upstream wetland. Downstream of the plunge pool, a fence has caused a debris jam although water flow is maintained. Substrate upstream of the culvert is fine grained soils typical of wetland habitat with sand and gravel observed downstream of The Gore Road. Due to private property, stream morphology was not collected although a slightly meandering channel may exist.

A copy of the Ministry of Transportation (MTO), Field Investigations, Watercourse Field Records, and Fish Habitat Mapping forms are presented in Appendix F. The MTO

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

protocol was used for field investigations and is accepted by Ministry of Natural Resources and the Department of Fisheries and Oceans. Photos showing upstream and downstream conditions during the site visit can be found in the Photos section of Appendix F.

4.3.5 Constraints

Habitat quality was generally good at all of the culvert crossings with direct fish habitat at Culvert #1, 4, 6 and 10. Seasonal barriers were noted by Burnside at the 4 crossings with direct fish habitat. Culverts that have seasonal conditions (Culvert # 2, 3, 5, 7, 8 and 9) did not show any signs of major erosion. Culvert Inlets that may be filled in from debris and/or soil could be designed to provide better drainage. Areas that have wetland conditions on the west side of The Gore Road (Culvert # 2, 3, 5, 7, 9 and 10) may be affected if the culvert elevations are modified allowing ponded water to drain. TRCA was concerned with changes to those culverts that may affect the wetland conditions (i.e., lowering of culvert inverts to allow positive drainage). During the detailed design phase of the project, these culverts will need to be designed in a way to maintain an invert elevation, which provides positive drainage during seasonally high water and maintains water in the upstream wetlands during low flow conditions.

4.3.6 Opportunities

Opportunities to enhance channel conditions upstream and downstream of the culverts may include, but are not limited to: pre formed scour pools at outlets, removal of accumulated debris to allow for improved fish passage, placement of clean rock to reduce bank erosion at the outlet, rocky ramps for fish passage, and riparian plantings in disturbed areas.

Water velocity must be controlled to reduce scouring and maintain the creation of large plunge pools at the outlet of all the culverts. This can be achieved by adjusting the gradient (slope) of the culvert itself and/or by the placement of a pre-formed scour pool at the culvert outlet. Velocity control is essential to preventing deep scour and sediment generation at the culvert outlet and its subsequent impact downstream.

4.3.7 Recommendations

Culvert design should provide for better alignment of culverts with existing or realigned channels, flow velocity control, and suitable gradient to support fish passage. Detailed erosion and sediment control plans should be developed to prevent entry of sediment into the watercourse. Fish salvage will be required as part of construction activities where pump by-pass or other water diversions are in place. Habitat downstream of the culverts can be improved if flow velocity is controlled and scour at the culvert outlet is

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

prevented. Timing of in-stream works should follow provincial standards for a coldwater classification.

4.4 Hydrogeology and Groundwater Conditions

A review of geology and physiography mapping for the study area indicates that the study area is located in hummocky terrain and surficial geology consists of deposits of fine sand, some gravel and minor silt or clay associated to the Oak Ridges Moraine complex. The sediments of the Oak Ridges Moraine make up the shallow aquifer in the study area. A review of the MOE water well records database indicated that 41 domestic water wells are located within approximately 100 m of The Gore Road between Highway 9 and Patterson Sideroad. 16 of the domestic wells are located in the bedrock and 25 are located in the overburden. The overburden wells range in depth from 3.4 meters to 32.3 metres. There are nine overburden wells with depths less than 10 meters. Shallow overburden wells in the study area obtain water from the Oak Ridges Moraine aquifer.

4.5 Stormwater Drainage/Stormwater Management

Within the study area, road runoff is conveyed primarily through grass-lined ditches on the east and west sides of The Gore Road. Due to the gently rolling topography, as well as the number of wetlands and watercourses (intermittent swales, creeks, etc.), stormwater flow is conveyed in an easterly pattern consistent with the overall drainage pattern of the geographic area.

Burnside staff completed a detailed hydrologic and hydraulic assessment for the existing Gore Road culvert crossings. As such, this stormwater management report (Appendix G) has been prepared to address issues of conveyance, water quality and flooding with the existing culvert crossings as well as identifying potential hydraulic improvements within the study area.

As a result of this analysis, it was determined that all the crossing structures, with the exception of the box culvert at Crossing N3, will need to be removed and replaced to meet the minimum design criteria. A summary of the proposed replacement for each crossing location are listed in Table 4.2 below.

The Gore Road Improvements from Patterson Sideroad to Highway 9
 Project File Report
 November 2013

Table 4.2 Culvert Dimension (Current and Proposed) Summary

Peel Culvert ID	TRCA Culvert ID	Station	Culvert Description	Current Length (m)	Proposed Culvert Description	Proposed Length (m)
1344	N/A	6+307	400 mm dia. CSP	32.4	600 mm dia. CSP	32.4
1345	10	5+128	500 mm dia. CSP	17.6	1,500 mm dia. CSP	19.6
1346	8	4+051	600 mm dia. CSP	23.4	600 mm dia. CSP	23.4
1347	7	3+572	600 mm dia. CSP	25.6	1,500 mm dia. CSP	33.6
1348	N/A	2+448	400 mm dia. CSP	14.4	600 mm dia. CSP	15.4
1349	N/A	2+338	460 mm dia. CSP	12.5	600 mm dia. CSP	15.0
1350	N/A	2+199	460 mm dia. CSP	17.4	600 mm dia. CSP	18.9
1351	5	1+558	800x500 mm Elliptical	18.0	1,200 mm dia. CSP	20.5
1352	4	1+190	800 mm dia. CSP	15.1	2,000 mm dia. CSPs	22.6
1353	3	0+819	700 mm dia. CSP	14.1	2,000 mm dia. CSP	17.1
1354	2	0+690	400 mm dia. CSP	13.8	600 mm dia. CSP	15.8
1355	1	0+428	1000 mm dia. CSP	17.0	2,500 mm dia. CSP	27.0
1356	N/A	0+022	1,000 mm dia. CSP	15.6	1,000 mm dia. CSP	21.1
N3	6	2+890	5,150x2,100 mm Concrete Box	20.2	5,150x2,100 mm Concrete Box	20.2
N2	N/A	4+459	500 mm dia. CSP	18.5	600 mm dia. CSP	20.0
N1	9	4+734	400 mm dia. CSP	15.0	600 mm dia. CSP	19.0

4.5.1 Roadway Swale Improvements

In addition to the proposed crossing replacements, the existing 'v' shaped roadside swales in the study area will be reconstructed to 0.75 m wide flat bottom swales which will provide for improved water quality and quantity within the study area. The original proposed width of the flat bottom swales was set at 1 m however; this was modified to 0.75 m in order to accommodate an additional 0.25 width to the proposed road shoulders. The side slopes of the swales have been assumed to be 2:1 at this preliminary design stage to minimize grading onto private property. The priority will be to avoid grading onto private property but even at 2:1, some back slopes may encroach onto private property. Where this occurs, the Region will consider the following forms of mitigation:

- secure a Permission to Enter (PTE) agreement with the landowner to allow for the grading to occur without any additional compensation;
- consider retaining walls as a means to reduce the limit of grading; and,
- consider an offer to purchase the property impacted by the grading.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

4.5.2 Fluvial Geomorphology Assessment

A Fluvial Geomorphological Assessments was completed by Parish Geomorph in January 2013 for seven of the 16 crossings reviewed in the SWM Report. A copy of the Fluvial Geomorphologic Assessment Report is provided as part of the SWM Report (see Appendix G). With the exception of existing box culvert at Crossing N3, which will remain, the proposed culvert sizes for the other six crossings as noted in Table 4.2, have been established based on the recommendations made in the fluvial geomorphological report. In addition, these six culverts will be buried 300 mm to provide for greater wetted width as compared to unburied culverts as well as increased fish passage.

4.6 Existing Utilities/Services

The study area contains a single row of wooden hydro poles along the eastern side of The Gore Road. Burnside noted that it appears that all above grade utilities (hydro, phone, cable, etc.) appeared to be mounted on the wooden poles.

The utility companies were circulated with plans during the EA Study to confirm the locations of existing and proposed servicing. Information was also gathered from the Region during the early part of the project to confirm the locations of the existing servicing. In general, relocations of existing utilities and municipal services are anticipated with this project including the relocation of hydro poles. This will be confirmed during detailed design.

4.7 Natural Hazards

The TRCA regulates development on hazard lands through the *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation* (O.Reg. 166/06). This regulation, also known as the “Generic Regulation”, includes watercourses, floodplains, erosion-prone slopes, wetlands and the areas directly adjacent to these hazardous features.

It must be recognized that the Generic Regulation limit does not constitute a “no development” zone. It simply identifies a “screening area” where study of the identified feature is required and a permit must be obtained.

Due to the presence of watercourses on or adjacent to the study area, any activity around these features will be subject to regulatory requirements and/or permits issued by the TRCA.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

4.8 Cultural and Built Environment

The Gore Road is classed as a Major Road (as classified in the Region of Peel OP) in the Town of Caledon. The abutting landscape is primarily rural residential and farmland.

Burnside retained Unterman McPhail Associates, Heritage Management Resource Consultants, to undertake a cultural heritage resource assessment of built heritage resources and cultural heritage landscapes for the study area (Appendix H).

A number of cultural heritage landscapes and built heritage resources were identified within and adjacent to the study corridor including roadsides, farm complexes and residences. The historical settlement of Lockton is located adjacent to the south limit of the study corridor. The residence situated at No. 17043 The Gore Road, and located within the historical settlement of Lockton, is located close to the road right-of-way. It will lose some frontage due to property acquisition. With the exception of the residence at No. 17043 The Gore Road, all of the identified built heritage resources identified within or adjacent to the study corridor are set a distance back from the roadside, outside of any impact zone.

The Town of Caledon identified two properties adjacent to The Gore Road study corridor that are included in the report Town of Caledon Built Heritage Resources Report of Findings (October 7, 2008). They are:

- No. 17412 The Gore Road; and,
- No. 17479 The Gore Road.

The Town also confirmed the following five properties are currently included on its built heritage inventory, namely:

- No. 7532 Patterson Side Road;
- No. 17243 The Gore Road;
- No. 17715 The Gore Road;
- Nos. 18460 and 18464 The Gore Road; and,
- No. 19037 The Gore Road.

The Town of Caledon Heritage Register (September 2011) includes one municipally designated property on The Gore Road, namely:

- No. 18696 The Gore Road.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

There is one municipally designated property adjacent to the study corridor on Patterson Side Road, namely:

- No. 7532 Patterson Side Road.

4.9 Archaeology/ Heritage

A Stage 1 Archaeological Assessment was completed by Archaeological Assessments Limited (AAL) in March 2011 (Appendix I1). The results of the assessment indicated the presence of some undisturbed areas located within 200 to 300 m of one or more watercourses within the study area. Potentially undisturbed areas along the corridor are associated with well drained tableland areas; and there is some potential for mid to late 19th century Euro-Canadian homesteads along the corridor. Given the moderate to high archaeological potential of some sections of the road corridor, AAL identified the need to undertake a Stage 2 Archaeological Assessment prior to any ground disturbance or any improvements to the road corridor.

A Stage 2 Archaeological Assessment was completed by AAL in June 2013 (Appendix I2). The physical assessment of the potentially undisturbed sections of the existing and expanded right-of-way was conducted in November 2012 and May 2013. The potentially undisturbed well drained areas were shovel test pitted at 5 m intervals. A few small sections of the proposed expanded right-of-way could not be surveyed by AAL because permission to access them was not granted by the property owners. These properties included 17715, 18243, 18809 and 18878 The Gore Road.

AAL determined that there are no significant archaeological resources present on the lands which were subjected to a Stage 2 Archaeological Assessment. Accordingly, there were no other further concerns for impacts to archaeological resources for the existing right-of-way and for the sections of the proposed expanded right-of-way which were subjected to a Stage 2 assessment. No further archaeological assessment of these areas is required. Some sections of the proposed expanded right-of-way (four properties noted above) will still require a Stage 2 assessment. This work should be planned for the detailed design phase.

In addition to the work completed by AAL, TRCA conducted their own Stage 1 to 2 Archaeological Assessment for sections of their lands within the study area proposed to be impacted by the project. No archaeological sites were found by TRCA for their lands.

4.10 Socio-economic Features

This section profiles the socio-economic characteristics of the Town of Caledon data provided in Statistics Canada's Population Census of 2006 and 2011. Statistics Canada

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

conducts the Census once every five years. As the data collected for the census was shortened in 2011, the information pertaining to labour rates and place of work to work was only available from the 2006 census.

4.10.1 Demographics

The population and employment rates of the Town of Caledon are shown in Table 4.3. At the time of the 2011 census 59,460 people lived in the Town of Caledon. Between 2006 and 2011, the population of Town of Caledon increased by 4.2% while the population of the province had increased by 5.7%.

Table 4.3 Population and Employment Rate in Town of Caledon, 2006 to 2011

Census Year	Population		Employment Rate	
	Total Population	Change in Population (between census periods)	Employment Rate	Unemployment Rate
2006	57,050		71.7%	4.1%
2011	59,460	4.2%	N/A	N/A

Source: Statistics Canada, Population Profiles of Canada (2006 and 2011).

4.10.2 Economic Development

Business services, manufacturing and other services employ over half of the people in Town of Caledon, and represent the greatest source of jobs for local residents, as well as within Ontario (Table 4.4).

Table 4.4 Employment by Industrial Sector in Town of Caledon, 2006

Industrial Sector	Town of Caledon (% of total)	Ontario (% of Total)
Agriculture and other resource-based industries	890 (2.7%)	190,000 (2.9%)
Construction	3,220 (9.8%)	384,775 (5.9%)
Manufacturing	4,965 (15.1%)	899,670 (13.9%)
Wholesale trade	2,705 (8.2%)	307,465 (4.7%)
Retail trade	3,435 (10.4%)	720,235 (11.1%)
Finance and real estate	1,875 (5.7%)	442,610 (6.8%)
Health care and social services	2,080 (6.3%)	611,740 (9.4%)
Educational services	2,100 (6.4%)	433,485 (6.7%)
Business services	6,690 (20.3%)	1,274,345 (19.7%)
Other services	4,960 (15.1%)	1,209,390 (18.7%)
Total - Experienced labour force	32,920	6,473,730

Source: Statistics Canada, Population Profile of Canada (2006).

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013


4.10.3 Dwellings

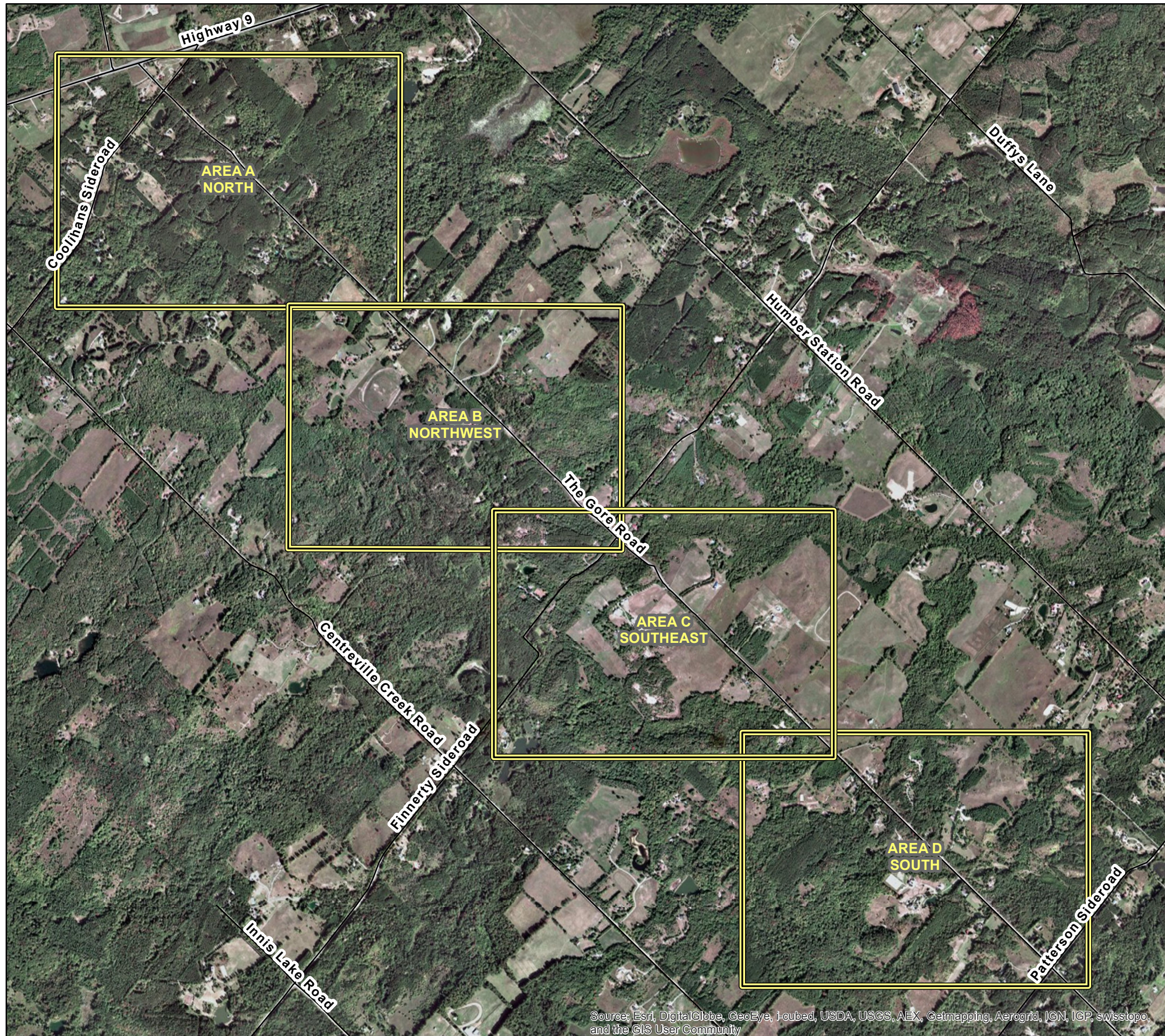
Approximately 52% of the dwellings in Town of Caledon were constructed between 1986 and 2006, compared with 31.4% in Ontario. The average value of dwellings in Town of Caledon in 2006 was \$457,586. This figure is considerably higher than the value of dwellings in Ontario (\$297,479) in the same year.

FIGURE 4.1
 REGION OF PEEL
 TOWN OF CALEDON

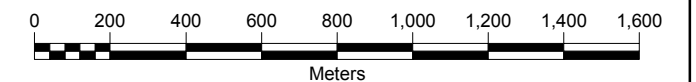
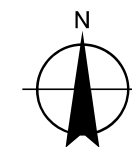
THE GORE ROAD PROJECT FILE REPORT
 NATURAL ENVIRONMENT
 KEY PLAN

Legend

 Natural Environment Figure Areas



Toronto and Region Conservation Authority, 2011.
 Region of Peel, 2011 (Ortho Imagery)



Scale: 1:20,000
 July, 2013
 Project Number: MTB019424

Projection: UTM Zone 17
 Datum: NAD 83

Prepared By: C. Dickie

Verified By: D. Evans



BURNSIDE

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

FIGURE 4.2 A
REGION OF PEEL
TOWN OF CALEDON
THE GORE ROAD PROJECT FILE REPORT
NATURAL ENVIRONMENT
NORTH



Legend

Water Feature Crossing (Bridge / Culvert)

Fish Habitat

- Permanent / Direct
- Seasonal / Indirect

*Water Feature Crossing ID: TRCA Crossin (Region of Peel Crossing #)

— Watercourses

TRCA Drainage Areas

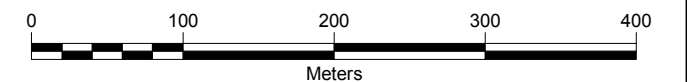
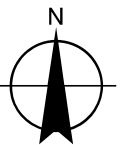
Ecological Land Classifications

- Open Water
- CU - Cultural Community
- CUM1-1 - Dry-Moist Old Field Meadow
- CUP3 - Coniferous Plantation Ecosite
- CUP3-1 - Red Pine Coniferous Plantation
- CUP3-3 - Scots Pine Coniferous Plantation
- CUW1 - Mineral Cultural Woodland Ecosite
- FOC2-2 - Dry-Fresh White Cedar Coniferous Forest
- FOC4-1 - Fresh-Moist White Cedar Coniferous Forest
- FOD5-2 - Dry-Fresh Sugar Maple-Beech Forest
- FOD6-1 - Fresh-Moist Sugar Maple-Lowland Ash
- FOD8-1 - Fresh-Moist Poplar Deciduous Forest
- FOM7-2 - Fresh-Moist White Cedar-Hardwood Mixed
- MAS2-1 - Cattail Mineral Shallow Marsh
- SWC3-2 - White Cedar-Conifer Org. Coniferous Swamp

Wetland

Butternut (*Juglans cinerea*)

Toronto and Region Conservation Authority, 2011.
 Region of Peel, 2011 (Ortho Imagery)



Scale: 1:5,000
 July, 2013
 Project Number: MTB019424

Projection: UTM Zone 17
 Datum: NAD 83

Prepared By: Z. Nevar

Verified By: D. Evans



BURNSIDE

FIGURE 4.2 B
REGION OF PEEL
TOWN OF CALEDON
THE GORE ROAD PROJECT FILE REPORT
NATURAL ENVIRONMENT
NORTHWEST



Legend

Water Feature Crossing (Bridge / Culvert)

Fish Habitat

- Permanent / Direct
- Seasonal / Indirect

*Water Feature Crossing ID: TRCA Crossing (Region of Peel Crossing #)

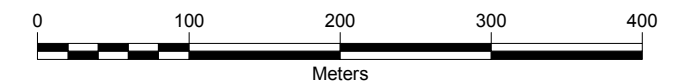
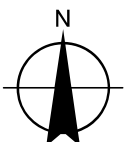
— Watercourses

TRCA Drainage Areas

Ecological Land Classifications

- Open Water
- CU - Cultural Community
- CUM1-1 - Dry-Moist Old Field Meadow
- CUP2 - Mixed Plantation Ecosite
- CUP3 - Coniferous Plantation Ecosite
- CUP3-1 - Red Pine Coniferous Plantation
- CUT1 - Mineral Cultural Thicket Ecosite
- CUT1-1 - Sumac Cultural Thicket
- CUW1 - Mineral Cultural Woodland Ecosite
- FOC2-2 - Dry-Fresh White Cedar Coniferous Forest
- FOD3-1 - Dry-Fresh Poplar Deciduous Forest
- FOD5-10 - Dry-Fresh Sugar Maple-White Birch-Poplar
- FOD5-8 - Dry-Fresh Sugar Maple-White Ash Forest
- FOD7-3 - Fresh-Moist Willow Lowland Forest
- FOM3-2 - Dry-Fresh Sugar Maple-Hemlock Mixed
- FOM4-2 - Dry-Fresh White Cedar-Poplar Mixed
- FOM7-2 - Fresh-Moist White Cedar-Hardwood Mixed
- MAM2-2 - Reed-canary Grass Mineral Meadow Marsh
- MAS2-1 - Cattail Mineral Shallow Marsh
- SWC3-2 - White Cedar-Conifer Org. Coniferous Swamp
- SWM1-1 - White Cedar-Hardwood Mineral Mixed Swamp
- Wetland

Toronto and Region Conservation Authority, 2011.
 Region of Peel, 2011 (Ortho Imagery)



Scale: 1:5,000
 July, 2013
 Project Number: MTB019424

Projection: UTM Zone 17
 Datum: NAD 83

Prepared By: Z. Nevar

Verified By: D. Evans



BURNSIDE

FIGURE 4.2 C
REGION OF PEEL
TOWN OF CALEDON
THE GORE ROAD PROJECT FILE REPORT
NATURAL ENVIRONMENT
SOUTHEAST

- Legend**
- Water Feature Crossing (Bridge / Culvert)**
- Fish Habitat**
- Permanent / Direct
 - Seasonal / Indirect
- *Water Feature Crossing ID: TRCA Crossin (Region of Peel Crossing #)
- Watercourses
- TRCA Drainage Areas
- Ecological Land Classifications**
- CU - Cultural Community
 - CUM1-1 - Dry-Moist Old Field Meadow
 - CUP2 - Mixed Plantation Ecosite
 - CUP3 - Coniferous Plantation Ecosite
 - CUP3-1 - Red Pine Coniferous Plantation
 - CUP3-2 - White Pine Coniferous Plantation
 - CUP3-3 - Scots Pine Coniferous Plantation
 - CUS1 - Mineral Cultural Savannah Ecosite
 - CUT1 - Mineral Cultural Thicket Ecosite
 - CUT1-1 - Sumac Cultural Thicket
 - CUW1 - Mineral Cultural Woodland Ecosite
 - FOC2-2 - Dry-Fresh White Cedar Coniferous Forest
 - FOC4-1 - Fresh-Moist White Cedar Coniferous Forest
 - FOD3-1 - Dry-Fresh Poplar Deciduous Forest
 - FOD4 - Dry-Fresh Deciduous Forest
 - FOD5-10 - Dry-Fresh Sugar Maple-White Birch-Poplar
 - FOD5-8 - Dry-Fresh Sugar Maple-White Ash Forest
 - FOD8-1 - Fresh-Moist Poplar Deciduous Forest
 - FOM4-2 - Dry-Fresh White Cedar-Poplar Mixed
 - FOM7-2 - Fresh-Moist White Cedar-Hardwood Mixed
 - MAM2-2 - Reed-canary Grass Mineral Meadow Marsh
 - MAS2-1 - Cattail Mineral Shallow Marsh
 - SBS1 - Shrub Sand Barren Ecosite
 - SWC1-1 - White Cedar-Mineral Coniferous Swamp
 - SWC3-1 - White Cedar-Org. Coniferous Swamp
 - SWD4-3 - White Birch-Poplar Mineral Deciduous Swamp
 - SWM1-1 - White Cedar-Hardwood Mineral Mixed Swamp
 - SWM4-1 - White Cedar-Hardwood Organic Mixed Swamp
- Wetland

Toronto and Region Conservation Authority, 2011.
 Region of Peel, 2011 (Ortho Imagery)

0 100 200 300 400
 Meters

Scale: 1:5,000
 July, 2013
 Project Number: MTB019424

Projection: UTM Zone 17
 Datum: NAD 83

Prepared By: Z. Nevar
 Verified By: D. Evans

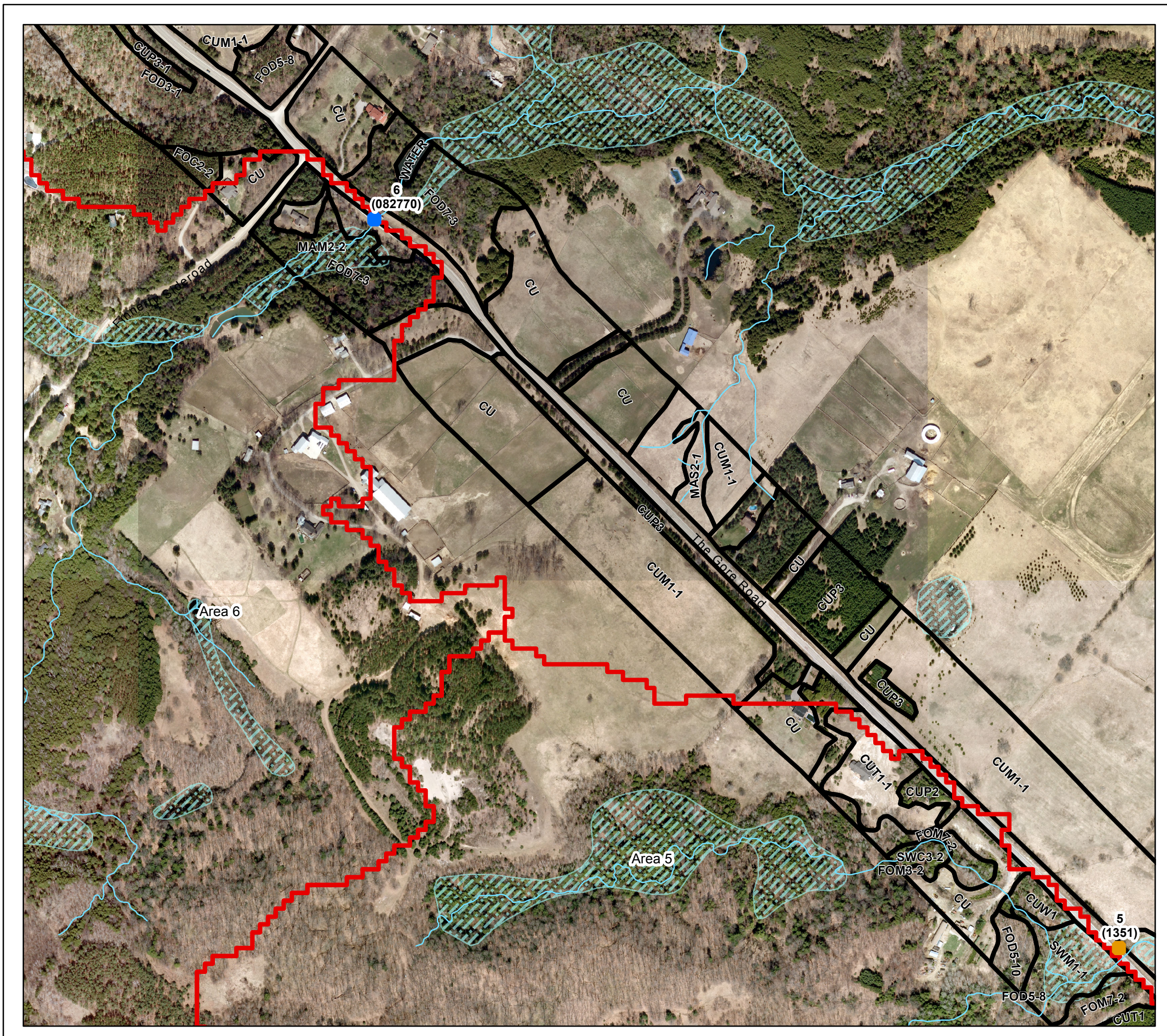


FIGURE 4.2 D
REGION OF PEEL
TOWN OF CALEDON
THE GORE ROAD PROJECT FILE REPORT
NATURAL ENVIRONMENT
SOUTH

Legend

Water Feature Crossing (Bridge / Culvert)

Fish Habitat

- Permanent / Direct
- Seasonal / Indirect

*Water Feature Crossing ID: TRCA Crossin (Region of Peel Crossing #)

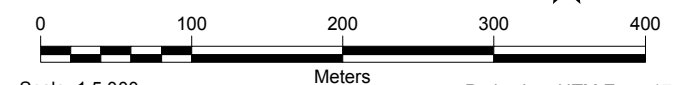
Watercourses

TRCA Drainage Areas

Ecological Land Classifications

- CU - Cultural Community
- CUM1-1 - Dry-Moist Old Field Meadow
- CUP2 - Mixed Plantation Ecosite
- CUP3 - Coniferous Plantation Ecosite
- CUP3-1 - Red Pine Coniferous Plantation
- CUP3-2 - White Pine Coniferous Plantation
- CUP3-3 - Scots Pine Coniferous Plantation
- CUS1 - Mineral Cultural Savannah Ecosite
- CUT1 - Mineral Cultural Thicket Ecosite
- CUT1-1 - Sumac Cultural Thicket
- CUW1 - Mineral Cultural Woodland Ecosite
- FOC2-2 - Dry-Fresh White Cedar Coniferous Forest
- FOC4-1 - Fresh-Moist White Cedar Coniferous Forest
- FOD3-1 - Dry-Fresh Poplar Deciduous Forest
- FOD4 - Dry-Fresh Deciduous Forest
- FOD5-10 - Dry-Fresh Sugar Maple-White Birch-Poplar
- FOD5-8 - Dry-Fresh Sugar Maple-White Ash Forest
- FOD8-1 - Fresh-Moist Poplar Deciduous Forest
- FOM4-2 - Dry-Fresh White Cedar-Poplar Mixed
- FOM7-2 - Fresh-Moist White Cedar-Hardwood Mixed
- MAM2-2 - Reed-canary Grass Mineral Meadow Marsh
- MAS2-1 - Cattail Mineral Shallow Marsh
- SBS1 - Shrub Sand Barren Ecosite
- SWC1-1 - White Cedar-Mineral Coniferous Swamp
- SWC3-1 - White Cedar-Org. Coniferous Swamp
- SWD4-3 - White Birch-Poplar Mineral Deciduous Swamp
- SWM1-1 - White Cedar-Hardwood Mineral Mixed Swamp
- SWM4-1 - White Cedar-Hardwood Organic Mixed Swamp
- Wetland

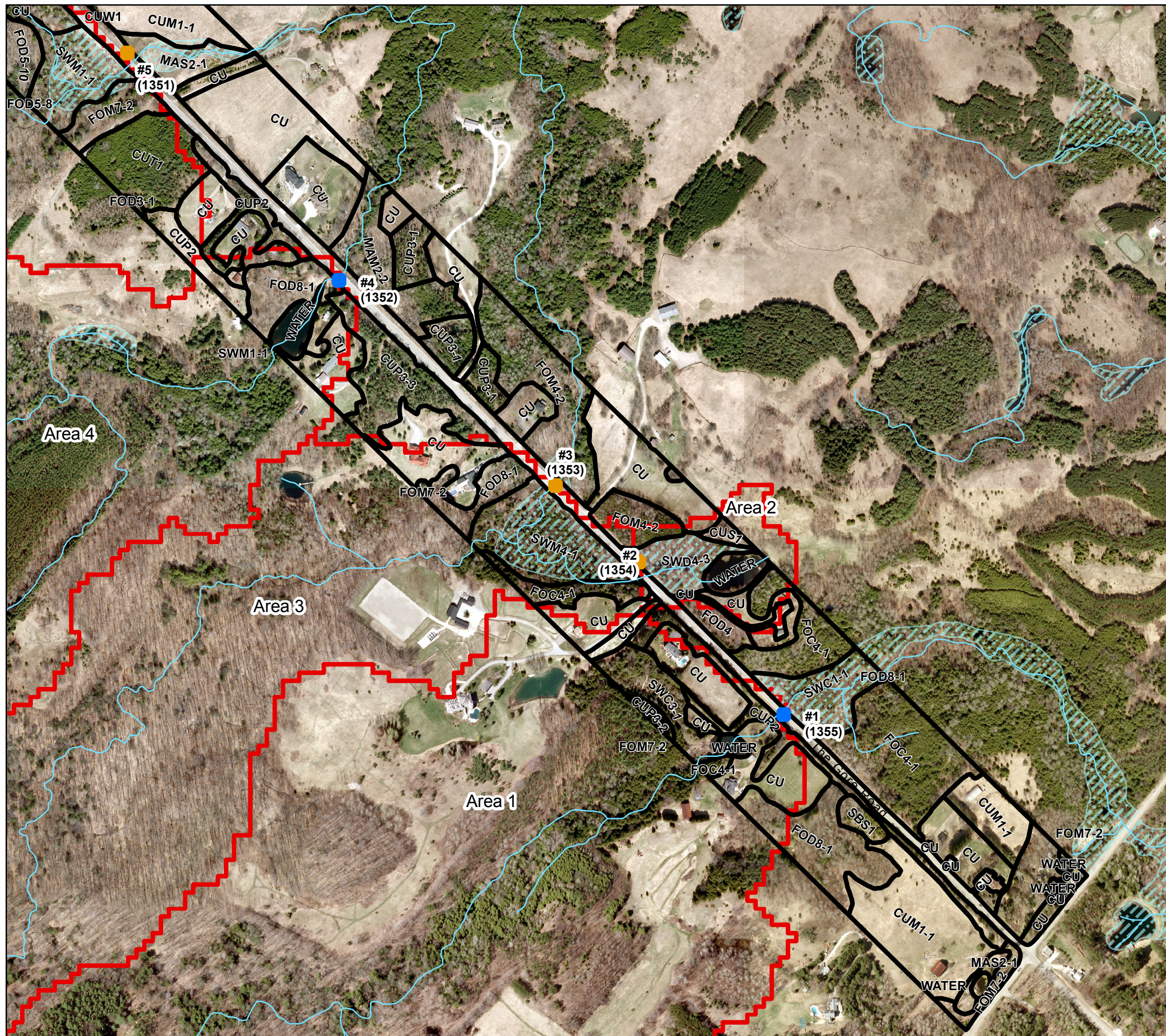
Toronto and Region Conservation Authority, 2011.
 Region of Peel, 2011 (Ortho Imagery)



Scale: 1:5,000
 July, 2013
 Project Number: MTB019424
 Projection: UTM Zone 17
 Datum: NAD 83

Prepared By: Z. Nevar

Verified By: D. Evans



The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

5.0 Evaluation of Alternative Solutions and Selection of the Preferred Solution

5.1 Description of Alternatives

This section identifies the three alternative solutions that were considered to address the 'problem statement' identified along The Gore Road as a part of this Schedule B Municipal Class EA. The alternative solutions were reviewed on the basis of natural environment, social/cultural environment, financial factors and technical factors. A discussion of each alternative is provided below.

5.1.1 Do Nothing

The "Do Nothing" was included to provide a base to which the other alternatives were be compared. This alternative means to take no action in addressing the problem statement. It is part of the Region's responsibility to its citizens to provide a road network that is safe, efficient, and which operates at an acceptable level of service. Accordingly, the "Do Nothing" alternative is an unacceptable course of action to pursue since it would not address mobility and other requirements within the Study Area. It would involve the continued maintenance of the roadway within the study area without any improvements or enhancements.

This alternative was eliminated from further consideration as it does not address the problem / opportunity statement.

5.1.2 Rehabilitate Existing Pavement

This alternative proposes mainly paving improvements to address the current pavement distress. No other improvements to The Gore Road are considered under this alternative. This alternative does not provide an opportunity to review / improve road shoulders and existing drainage along with other aspects such as sight distances.

Although this alternative partially addresses the problem/opportunity statement it does not fully address all items and has not been carried forward.

5.1.3 Two-Lane Full Reconstruction

This alternative provides the opportunity to improve the condition of the road base and address the deteriorating pavement condition as well as providing an opportunity to assess the vertical / horizontal alignment, improve shoulder areas and drainage, and initiate a pilot program for traffic active transportation on The Gore Road. Not only will this alternative fully address the problem/opportunity statement, but it allows for context sensitive design solutions that are compatible with the adjacent land uses.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

5.1.4 Summary of the Preferred Alternative Solution

Based upon the technical and environmental considerations in combination with input received from the various stakeholders including government agencies, utilities and the general public, two-lane full reconstruction of The Gore Road was selected as the preferred alternative solution. The repaving of The Gore Road in combination with improved grades, road shoulders, and drainage was found best to address the identified operational and traffic concerns and accommodate the projected corridor traffic demands. With the implementation of mitigation measures, the preferred alternative will have limited impacts on the natural, socio-economic and built environment.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

6.0 Evaluation of Alternative Design Concepts for Preferred Solution

6.1 Description of Alternative Designs

Based on the preferred solution of a two-lane full reconstruction of The Gore Road, the study team has also evaluated three alternative design concepts based on design speed for the roadway: 70 km/hr throughout, 80 km/hr throughout and a 70 km/hr or higher throughout. The alternative design concepts were evaluated using the following criteria: natural environment, social/cultural environment, financial factors and technical factors. The evaluation of each of the alternatives using the identified criteria is presented below in Table 6.1.

6.2 Preferred Design Concept

Based on the evaluation of alternative design concepts, the preferred design speed for the two-lane reconstructed roadway is 70 km/hr or higher.

Features of the reconstruction include:

- Improved vertical and horizontal alignments.
- Widen and pave shoulder areas to allow for improved road side stops and road base stability and facilitate Active Transportation.
- Initiation of a pilot project shown to systematically reduce run-off-road events. The Region plans to add narrow rumble strips under the edge line pavement marking to add an alert to drivers who may cross into the paved shoulder. This approach will improve The Gore Road for pedestrians, cyclists and motorists. The rumble strips will have a skip pattern applied in order to allow cyclists to enter and exit the paved shoulder.
- A rural cross-section including 3.5 m wide vehicle lanes and 1.75 m paved shoulders with a pavement structure comprised of 150 mm depth of asphalt, 150 mm of granular A and 500 mm of granular B for the majority of the study area;
- A semi-urban cross-section including 3.5 m wide vehicle lanes and 1.75 to 2 m paved shoulders with mountable curbs with the same pavement structure as rural cross-section.
- Temporary construction easements or property acquisition will be required in specific locations along the length of the project to accommodate the proposed typical section, large cuts, and improved road side drainage.
- An estimated 323 trees will need to be removed in the roadside vegetation over the length of the project.

The Gore Road Improvements from Patterson Sideroad to Highway 9
Project File Report
November 2013

Preliminary Road Drawings and Sections of the proposed design area are provided in Appendix J.

6.3 Additional Project Upgrades

In addition to the primary road reconstruction features noted above, the enhancements are proposed for the study area:

- Retaining Walls will be implemented at some locations (see Appendix J) to minimize property grading;
- Driveway grades will be maintained to existing conditions or improved;
- New driveway culverts will be installed at all properties; and,
- All circular cross culverts will be replaced with 600 mm diameter culverts or larger to meet current standards.




6.4 Preliminary Cost Estimate




A Preliminary Cost Estimate for the project including engineering, construction and related costs was prepared in conjunction with the background work and preliminary design drawings prepared as part of this Study. The Preliminary Cost Estimate totalling approximately \$9,860,000 for the proposed improvements to The Gore Road (not including property acquisition costs) is detailed in Appendix K.







6.5 Geotechnical Investigation

V.A. Wood Associates Limited was retained by Burnside to carry out the geotechnical investigation of the study area. The geotechnical investigation assessed the current road conditions and provided recommendations for the alternative solutions of road rehabilitation or full reconstruction. The geotechnical report showed that full reconstruction of the roadway was the preferred solution since rehabilitation of the road surface through repaving would not provide a long term solution based on the general poor condition of the pavement through the study area and some areas of severe pavement damage (with possible failure of the subgrade). The geotechnical investigations were used in the preparation of the preliminary design and cost estimates. A copy of the geotechnical investigation report is provided in Appendix M.

Table 6.1 Criteria for Evaluating Alternatives

CRITERIA FOR EVALUATING ALTERNATIVES		70 km/h Design Speed	80 km/h Design Speed	70 km/h or Higher Design Speed
A	Natural Environment <i>Rating:</i>	 Most Preferred	 Least Preferred	 Partially Preferred
1	Designated Features	<p>Minimal impact over existing conditions. Works would occur mainly within existing right-of-way.</p> <p>The Caledon Hill Complex Life Science Site and candidate Life Science Area of Natural and Scientific Interest (ANSI) is located in the study area crossing The Gore Road several times. Any works in these areas will be subject to permitting and approval requirements as established by TRCA based on the area and function of any impacted features.</p> <p>The lands within the study area are identified as 'Natural Core Areas' within the Oak Ridges Moraine Conservation Plan (ORMCP) which allows for the provision of transportation facilities and related structures providing environmental impacts are minimized.</p>	<p>High impact over existing conditions. In a large number of areas works would extend beyond the existing right-of-way.</p> <p>The Caledon Hill Complex Life Science Site and candidate Life Science Area of Natural and Scientific Interest (ANSI) is located in the study area crossing The Gore Road several times. Any works in these areas will be subject to permitting and approval requirements as established by TRCA based on the area and function of any impacted features.</p> <p>The lands within the study area are identified as 'Natural Core Areas' within the Oak Ridges Moraine Conservation Plan (ORMCP) which allows for the provision of transportation facilities and related structures providing environmental impacts are minimized.</p>	<p>Moderate impact over existing conditions. Works would occur mainly within existing right-of-way with some works beyond the existing right-of-way.</p> <p>The Caledon Hill Complex Life Science Site and candidate Life Science Area of Natural and Scientific Interest (ANSI) is located in the study area crossing The Gore Road several times. Any works in these areas will be subject to permitting and approval requirements as established by TRCA based on the area and function of any impacted features.</p> <p>The lands within the study area are identified as 'Natural Core Areas' within the Oak Ridges Moraine Conservation Plan (ORMCP) which allows for the provision of transportation facilities and related structures providing environmental impacts are minimized.</p>
2	Water Quality and Quantity	Minimal impact provided that erosion/sediment controls are in place during construction to safeguard water quality. Works would occur mainly within existing right-of-way. Overall improvement with the replacement of the existing culverts.	Moderate impact provided that erosion/sediment controls are in place during construction to safeguard water quality. In a number of areas works would extend beyond the existing right-of-way. Overall improvement with the replacement of the existing culverts.	Minimal impact provided that erosion/sediment controls are in place during construction to safeguard water quality. Works would occur mainly within existing right-of-way with some works beyond the existing right-of-way. Overall improvement with the replacement of the existing culverts.
3	Floodplain Lands	Minimal impact to adjacent lands. Construction that may occur within the floodplain will be subject to TRCA regulations and permitting requirements. Flood storage and conveyance in project-affected fill-regulated areas not anticipated to be negatively affected. Flood conveyance is expected to improve.	Moderate impacts to adjacent lands. Construction that may occur within the floodplain will be subject to TRCA regulations and permitting requirements. Flood storage and conveyance in project-affected fill-regulated areas not anticipated to be negatively affected. Flood conveyance is expected to improve.	Minimal impact to adjacent lands. Construction that may occur within the floodplain will be subject to TRCA regulations and permitting requirements. Flood storage and conveyance in project-affected fill-regulated areas not anticipated to be negatively affected. Flood conveyance is expected to improve.
4	Terrestrial Habitat	Minimal impact to adjacent lands. Works may be required outside of the existing ROW resulting in potential habitat loss/change/disturbance.	Moderate impact to adjacent lands. Works may be required outside of the existing ROW resulting in potential habitat loss/change/disturbance. Significantly more than 323 trees will need to be removed and replaced based on a 3:1 restoration ratio.	Minimal impact to adjacent lands. Works may be required outside of the existing ROW resulting in potential habitat loss/change/disturbance. An estimated 323 trees will need to be removed and will be replaced based on a 3:1 restoration ratio.

CRITERIA FOR EVALUATING ALTERNATIVES	70 km/h Design Speed	80 km/h Design Speed	70 km/h or Higher Design Speed
5 Aquatic Habitat	Minimal Impacts to aquatic habitat. Potential impacts on aquatic habitat dependent upon repair activities. In-water works would be required. Opportunity to improve aquatic habitat. No in-water works will occur during the coldwater timing window from September 16 th to June 14 th . Timing window has been confirmed with TRCA.	Moderate Impacts to aquatic habitat. Potential impacts on aquatic habitat dependent upon repair activities. In-water works would be required. Opportunity to improve aquatic habitat. No in-water works will occur during the coldwater timing window from September 16 th to June 14 th . Timing window will be confirmed with TRCA.	Minimal Impacts to aquatic habitat. Potential impacts on aquatic habitat dependent upon repair activities. In-water works would be required. Opportunity to improve aquatic habitat. No in-water works will occur during the coldwater timing window from September 16 th to June 14 th . Timing window will be confirmed with TRCA.
B Socio-economic/ Cultural Environment <i>Rating:</i>	 Partially Preferred	 Least Preferred	 Most Preferred
1 Compatibility with Surrounding Land Uses (Aesthetics)	Minimal impact to existing land uses as works would primarily occur within the existing right-of-way. Maintains the rural characteristics and aesthetics of the corridor.	Increased impact to existing land uses, as works would occur outside of the existing right-of-way. Significant impact to rural characteristics and aesthetics of the corridor.	Minimal impact to existing land uses as works would primarily occur within the existing right-of-way. The rural character of the study area will be maintained.
2 Conformity to Local Municipal plans	Addresses the need to maintain The Gore Road as an Arterial Road and accommodates Active Transportation needs. Does not fully address safety requirements. Does not conform to Transportation Association of Canada (TAC) standards.	Addresses the need to maintain The Gore Road as an Arterial Road and accommodates Active Transportation needs. Conforms to TAC standards.	Addresses the need to maintain The Gore Road as an Arterial Road and accommodates Active Transportation needs. Partially conforms to TAC standards.
3 Effect on Property / Land Acquisition	Minimal impact over existing conditions. Property acquisition will be kept to a minimum with some temporary construction easements and property required outside of the existing right-of-way. In general, the road reconstruction activities would occur within the existing The Gore Road right-of-way with associated grading activities extending beyond the existing right-of-way.	Option with highest impact over existing conditions as 80 km/h design conditions (including active transportation facilities and improved ditches) cannot be accommodated within the existing 30 m wide road right-of-way for The Gore Road as documented in the Region of Peel Official Plan and would require an Official Plan amendment. Temporary construction easements and property acquisition would be required.	Moderate impact over existing conditions. Temporary construction easements and property acquisition will be minimized where possible. Road reconstruction activities (including active transportation and improved ditches) would occur within the existing 30 m wide right-of-way with associated grading activities extending beyond the existing right-of-way.
4 Heritage Resources (archaeological features, built heritage, and cultural heritage landscapes)	Minimal impact over existing conditions. One designated property was identified within the study area in close proximity to the existing right-of-way, 17043 The Gore Road Built Heritage Resources (BHR). To avoid potential impacts, landscaping associated with the improvements will be designed to minimize any potential disruption effects, i.e., visual, and be in keeping with the character rural character of the study area and to minimize impacts on existing resources	Increased impact over existing conditions as extensive works outside of the existing right-of-way would be required. A Stage 1 Archaeological Assessment was completed for the study area and found that there was potential for locating historical remains within the study area limits due to some undisturbed areas and within 200-300 metres of a watercourse. A Stage 2 Archaeological Assessment was completed for the majority of areas with archaeological potential and no archaeological resources were found. A few small sections of the proposed expanded right-of-way could not be surveyed because permission to	A Stage 1 Archaeological Assessment was completed for the study area and found that there was potential for locating historical remains within the study area limits due to some undisturbed areas and within 200-300 metres of a watercourse. A Stage 2 Archaeological Assessment was completed for the majority of areas with archaeological potential and no archaeological resources were found. A few small sections of the proposed expanded right-of-way could not be surveyed because permission to access them was not granted by the property owners. These properties included 17715, 18243, 18809 and 18878. A Stage 2 Archaeological Assessment will need to be completed for these

CRITERIA FOR EVALUATING ALTERNATIVES	70 km/h Design Speed	80 km/h Design Speed	70 km/h or Higher Design Speed
		<p>access them was not granted by the property owners. These properties included 17715, 18243, 18809 and 18878. A Stage 2 Archaeological Assessment will need to be completed for these properties prior to any ground disturbance or construction activities.</p> <p>Potential to impact The Gore Road and the Lockton Historical Settlement Cultural Heritage Landscapes (CHL). One designated property was identified within the study area in close proximity to the existing right-of-way, 17043 The Gore Road Built Heritage Resources (BHR).</p>	<p>properties prior to any ground disturbance or construction activities.</p> <p>One designated property was identified within the study area in close proximity to the existing right-of-way, 17043 The Gore Road Built Heritage Resources (BHR).</p> <p>To avoid potential impacts, landscaping associated with the improvements will be designed to minimize any potential disruption effects, i.e., visual, and be in keeping with the character rural character of the study area and to minimize impacts on existing resources.</p>
5 Nuisance Impacts (noise, traffic)	Minimal impact over existing conditions. Moderate temporary noise and traffic disruptions due to construction. The overall capacity of The Gore Road will remain the same therefore no long term impacts with respect to noise are expected.	Increased temporary noise and traffic disruptions due to construction. The overall capacity of The Gore Road will remain the same therefore no long-term impacts with respect to noise are expected.	Minimal impact over existing conditions. Moderate temporary noise and traffic disruptions due to construction. The overall capacity of The Gore Road will remain the same therefore no long term impacts with respect to noise are expected.
C Financial Factors Rating:	 Most Preferred	 Least Preferred	 Partially Preferred
1 Estimated Capital Costs and Total Estimated Cost (25 year planning horizon)	Lowest expense for potential road reconstruction. Moderate expense associated with utility relocations.	Highest expense for potential road reconstruction. Highest expense associated with utility relocations	Moderate expense for potential road reconstruction. Moderate expense associated with utility relocations.
D Technical Factors Rating:	 Least Preferred	 Most Preferred	 Partially Preferred
1 Addresses Technical Safety Concerns/Strategies	Accommodates or exceeds future operational requirements. Does not fully address requirements to be maintained as an Arterial Road. Accommodates Active Transportation needs for The Gore Road. . Does not conform to TAC standards	Accommodates or exceeds future operational and safety requirements for The Gore Road to be maintained as an Arterial Road. Accommodates or exceeds Active Transportation needs. Provides improved shoulder areas for improved road stability and safe stopping. Conforms to TAC standards.	Addresses safety requirements for The Gore Road. Accommodates future operational requirements to be maintained as an Arterial Road and Active Transportation needs. Provides improved shoulder areas for stopping and improved road stability.
RECOMMENDED ALTERNATIVE	Not Preferred	Not Preferred	Preferred

Least Preferred to Most Preferred



7.0 Impacts and Mitigation

During the project study various issues were raised with respect to the proposed project. The following measures should be implemented in order to mitigate negative impacts of the proposed project on the environmental features of the study area:

7.1 Surface Water/Hydrology & Soils and Sedimentation/Stormwater Management

Effect

- A. Potential for sediments to enter watercourse or wet areas as a result of the following project activities:
 - stockpiling
 - excavation
 - construction.

- B. Potential for localized water quality impacts as a result of spills.

Mitigation

- A. The footprint of disturbed area will be minimized as much as possible, for example, vegetated buffers will be left in place adjacent to watercourses/ wet areas to the maximum extent possible.

A detailed erosion and sediment control plan will be developed during detailed design prior to construction. Implementation of the erosion and sediment control measures will conform to recognized standard specifications such as Ontario Provincial Standards Specification (OPSS) and the requirements of the TRCA.

Stockpiled material will be stored at a safe distance from the watercourses and wet areas to ensure that no deleterious substances enter the water.

Sediment and erosion control measures (silt curtains, silt fence, rock check dams) will be installed and will be maintained during the work phase and until the site has been stabilized. Control measures should be inspected daily and following rain events during the resident inspection period by a Certified Inspector of Sediment and Erosion Control to ensure they are functioning and are maintained as required. If control measures are not functioning properly, no further work will occur until the problem is resolved.

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

Any temporary mitigation measures will be installed prior to the commencement of any clearing, grubbing, excavation, filling or grading works and will be maintained on a regular basis, prior to and after runoff events.

- B. All equipment fuelling and maintenance will be done at a safe distance from the watercourses and wet areas to ensure that no deleterious substances enter the waterway.

The contractor will be required to develop spill prevention and contingency plans for construction and operational phases of the project. Personnel will be trained in how to apply the plans and the plans will be reviewed to strengthen their effectiveness and ensure continuous improvement. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. A hydrocarbon spill response kit will be on site at all times during the work. Spills will be reported to the Ontario Spills Action Center at 1-800-268-6060.

7.2 Groundwater

Effect

- A. Potential for localized groundwater quality impacts as a result of spills.
- B. Potential for temporary localized groundwater supply impacts as a result of temporary dewatering. The proposed road works is unlikely to impact the shallow groundwater wells in the area. However, short-term dewatering may be necessary with replacement of culverts and the potential for impacts to surrounding wells will depend on their vicinity to the construction activities.

Mitigation

- A. Refueling of equipment and fuel storage should be conducted in designated areas away from the watercourses or wet areas with spill protection provided.
- B. Should it be determined that a private water supply has been adversely affected by the dewatering activities, the contractor will arrange for provision of alternative drinking water supplies until such time as the dewatering activities have been completed and monitoring confirms that the water level in the affected well has returned to static conditions.

7.3 Noise/Vibration/Air Quality

Effect

- A. Temporary nuisance noise and vibration during construction activities. Increased dust in air from construction activities.

Mitigation

- A. Noise control measures, such as restricted hours of operation, the use of appropriate machinery/mufflers, will be implemented where required. Vehicles/machinery and equipment should be in good repair, equipped with emission controls, as applicable, and operated within regulatory requirements. Dust control measures will be implemented as required during construction.

7.4 Fish and Fish Habitat

Effect

- A. Potential water quality impairments (sediment loading; fuels and lubricants from machinery). In-water works will be required.

Mitigation

- A. Sediment and erosion control measures (such as silt fence barriers, turbidity curtains etc.) will be installed and maintained during the construction phase and until the site has been stabilized. Control measures will be inspected daily and following rain events during the resident inspection period by a Certified Inspector of Sediment and Erosion Control to ensure they are functioning and are maintained as required. If control measures are not functioning properly, no further work will occur until the problem is resolved. All temporary erosion and sediment control measures will be installed in accordance with recognized provincial standards. Extra silt fence/turbidity curtain will be on site, should additional sediment control be required.

Prevent any in-water operation of heavy equipment and minimize operation of the same on the banks of the watercourse. Any stockpiled material will be stored and stabilized away from the watercourse. All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering the water.

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

All disturbed areas of the work site should be stabilized immediately and re-vegetated as soon as conditions allow.

No in-water works will occur during the coldwater timing window from September 16 to June 14.

Discussions will be required with TRCA and MNR during detailed design to confirm appropriate mitigation measures as well as opportunities for enhancements. Opportunities may include, but are not limited to: pre formed scour pools at outlets, removal of accumulated debris to allow for improved fish passage, placement of clean rock to reduce bank erosion at the outlet, rocky ramps for fish passage, and riparian plantings in disturbed areas.

All the crossing structures, with the exception of the box culvert at Crossing N3, will need to be removed and replaced to meet the minimum design criteria. Six of the new culverts (Crossings 1345, 1347, 1352, 1353, 1355 and 1356) are proposed to be buried to accommodate a greater wetted width as compared to an unburied culvert as well as an increased opportunity for fish passage.

7.5 Archaeology/Heritage

Effect

- A. Potential for locating historical remains within the study area limits due to some properties that were unable to be surveyed during the Stage 2 assessment. No designated properties were identified within the study area.
- B. There will be some minor tree removal. Generally fencing will not be disturbed. However, if some sections of rail fencing located within areas of property acquisition are affected by the undertaking, they will be rebuilt or replaced.
- C. There will be temporary noise during the construction activities and increased dust in the air from construction activities. Some grading work may occur outside the existing right-of-way (ROW). There will be some property acquisition that may affect agricultural land. The historical settlement of Lockton is located adjacent to the south limit of the study corridor. The residence situated at No. 17043 The Gore Road, and located within the historical settlement of Lockton, is located close to the road right-of-way. It will lose some frontage due to property acquisition.

Mitigation

- A. A Stage 2 Archaeological Assessment will be completed at properties not previously assessed during the course of the EA study, prior to any ground disturbance or construction activities. Provisions of the OPPS will be followed if any archaeological artifacts are found during reconstruction activities.
- B. The existing rural character of The Gore Road, such as mature tree lines and rail fencing, will be protected along the length of the study corridor where possible. Avoid mature trees and tree lines where possible to preserve the existing character of the roadscape. A photographic documentation of the linear corridor of the roadscape should be prepared prior to construction and a report provided to the Town of Caledon.
- C. A Cultural Heritage Impact Assessment report should be prepared for No. 17043 The Gore Road prior to any construction activities to determine if the residence located at No. 17043 The Gore Road and associated with the historical settlement of Lockton is of heritage value or interest. If the residence is determined to be of heritage value, mitigation shall include consideration of moving the building back on its site, protection from construction activities and monitoring of vibration impacts in the vicinity of the residence. If the building is vacated as a result of the road improvements, it shall be properly secured and protected from vandalism and maintained in good condition. This report shall be provided to the Town of Caledon.

A Cultural Heritage Documentation Report should be prepared prior to construction activities to document with photographs the context of the historical settlement hamlet of Lockton. The report will include a physical description of the settlement, an annotated photographic documentation of the associated heritage resources with photo key plans, and a location map. This report shall be provided to the Town of Caledon.

7.6 Vegetation, Wetland and Wildlife/Habitat

Effect

- A. Loss of vegetation, wetland and Habitat. The project is primarily proposed in previously disturbed areas within the right-of-way (ROW) where limited vegetation/habitat exists. Based on the results of the tree inventory by Aboud & Associates, it is estimated that 323 trees will need to be removed during the road reconstruction. Tables 7.1 and 7.2 below summarize the anticipated wetland and vegetation loss resulting from the road reconstruction based on the preliminary design plans. The extent of areas impacted will need to be reassessed at the detailed design phase upon completion of the final design plans.

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

- B. Impact to wildlife movement and loss of wildlife (primarily deer and amphibians) due to wildlife-vehicle collisions.

Mitigation

- A. Minimize disturbance to existing vegetation and wetland habitats. Grading within evaluated wetlands should be avoided. The movement of equipment and machinery should be kept to the construction side of the road ROW and environmentally sound practices will be followed when works occur within or adjacent to wetland habitat. Any stockpiled material will be stored and stabilized away from wetlands. All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering the wetland area.

During the detailed design phase of the project, the MNR should be consulted to further refine proposed grading in evaluated wetlands. Discussions should include a review of alternative slope designs and ways to minimize impacts from alternation of wetland drainage.

Sediment and erosion control measures (such as silt fence barriers) will be installed and maintained during the construction phase and until the site has been stabilized. Control measures will be inspected regularly, as identified in Section 8.0, to ensure they are functioning and are maintained as required. If control measures are not functioning properly, no further work will occur until the problem is resolved. All temporary erosion and sediment control measures will be installed in accordance with recognized provincial standards. Extra silt fence/turbidity curtain will be on site, should additional sediment control be required.

Disturbed areas should be stabilized and re-vegetated upon project completion and restored to a pre-disturbed state. Topsoil should be stockpiled separately and used for restoration to facilitate natural regeneration of native species.

Removed trees will be replaced at a 3:1 compensation ratio. A restoration/compensation plan should be prepared during the detailed design phase. This plan should include detailed species lists and planting locations for all restoration activities. Compensation methodology (3:1 replacement) follows Region of Peel standards. Detailed landscape/restoration designs are recommended to be comprised of a blend of large trees, small trees and shrubs to meet the required replacement ratio based on restoration area specific goals and functions (e.g. aesthetics, mitigation of impacted areas, enhancement of diversity of native woody plant species and variety in plant community structure). It has been demonstrated that there is sufficient area within the public right of way of the Gore Road to receive

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

the required number of plants. If it is determined that sufficient area will not be available as detailed design progresses, further discussion with adjacent landowners will be required to assess the suitability (e.g. public vs. private, ease of access during installation and long-term maintenance, landscape/ecological functions) of adjacent lands to receive plantings.

Detailed planting layout and specifications are to follow Appendix C "Planting Standards & Maintenance Practices" of the Region of Peel Streetscape Toolbox (July 2010). The standards include analyzing soils within the right-of-way to identify undesirable planting conditions and amending (e.g. fertility, texture, compaction, toxins) as required to encourage plant vitality.

Discussions will be required with TRCA during detailed design to confirm appropriate mitigation measures as well as opportunities for enhancements.

The primary measure used to avoid the incidental take of migratory birds is to conduct all vegetation clearing outside of the identified breeding bird window for the specific study area (avoidance). For Southern Ontario this window typically covers the period from May 1 to August 8.

- B. During the detailed design phase of the project, the Region of Peel will investigate opportunities in collaboration with the TRCA to implement mitigation measures to help reduce impacts to wildlife movement especially for amphibians associated with wetland and forest habitats. These efforts will be in keeping with the TRCA's proposed Mitigation and Monitoring Protocol for Wildlife Connectivity along The Gore Road between Patterson Sideroad and Highway 9 (see Appendix E).

Mitigation measures to prevent deer-vehicle collisions may include the consideration of technologies and/or management approaches to improve driver safety and awareness within the study area that will be assessed further during the detailed design phase of the project. Based on recommendations included in the MNR report (see Appendix A2), these may include:

- Increasing the size of deer crossing signs south of Coolihan's Sideroad and adding dusk and dawn flashers to warn drivers of ungulate hazards in that area;
- Erecting exclusion fencing where there is found to be a higher than average number of deer-vehicle collisions, with consideration of adjacent habitat that may attract ungulates to the roadside (such as woodlands, fields, creeks).

During the detailed design, MNR should be consulted regarding the use of wildlife fencing.

The Gore Road Improvements from Patterson Sideroad to Highway
November 2013

Table 7.1 Summary of Wetland Area Loss

ELC Community (Wetland type)	Wetland Lost (ha)	Total Community Area (ha)	%
Reed-canary Grass Mineral Meadow Marsh Type, MAM2-2	0.1027	1.4717	6.98
Cattail Mineral Shallow Marsh Type, MAS2-1	0.0450	2.5974	1.73
White Cedar Mineral Coniferous Swamp Type, SWC1-1	0.0924	0.8935	10.34
White Cedar Organic Coniferous Swamp Type, SWC3-1	0.0000	0.7582	0.00
White Cedar-Conifer Organic Coniferous Swamp Type, SWC3-2	0.0298	1.2750	2.34
White Birch – Poplar Mineral Deciduous Swamp Type, SWD4-3	0.0434	0.6113	7.11
White Cedar – Harwood Mineral Mixed Swamp Type, SWM1-1	0.0753	1.0061	7.49
White Cedar – Hardwood Organic Mixed Swamp Type, SWM4-1	0.0690	1.5002	4.60
Total	0.4577	10.1135	

The Gore Road Improvements from Patterson Sideroad to Highway
November 2013

Table 7.2 Summary of Vegetation Area Loss

ELC Community	Vegetation Lost (ha)	Total Community Area (ha)	%
Dry-Moist Old Field Meadow Type, CUM1-1	0.0387	16.4201	0.24
Mixed Plantation Ecosite, CUP2	0.1232	2.0440	6.03
Red Pine Coniferous Plantation Type, CUP3-1	0.1205	11.4237	1.05
White Pine Coniferous Plantation Type, CUP3-2	0.0000	0.0558	0.00
Scots Pine Coniferous Plantation Type, CUP3-3	0.1983	4.7758	4.15
Mineral Cultural Savannah Ecosite, CUS1	0.0000	0.1444	0.00
Mineral Cultural Thicket Ecosite, CUT1	0.0271	1.1977	2.26
Sumac Cultural Thicket Type, CUT1-1	0.0267	1.2201	2.19
Mineral Cultural Woodland Ecosite, CUW1	0.0356	0.5364	6.65
Dry-Fresh White Cedar Coniferous Forest Type, FOC2-2	0.0602	2.5601	2.35
Fresh-Moist White Cedar Coniferous Forest Type, FOC4-1	0.1059	5.5412	1.91
Dry-Fresh Poplar Deciduous Forest Type, FOD3-1	0.1009	4.6436	2.17
Dry-Fresh Deciduous Forest Ecosite, FOD4	0.0398	0.2729	14.58
Dry-Fresh Sugar Maple – Beech Deciduous Forest Type, FOD5-2	0.0000	0.9359	0.00
Dry-Fresh Sugar Maple-White Ash Deciduous Forest Type, FOD5-8	0.0000	0.6334	0.00
Dry-Fresh Sugar Maple – White Birch – Poplar Deciduous Forest Type, FOD5-10	0.0000	0.3994	0.00
Fresh-Moist Sugar Maple – Lowland Ash Deciduous Forest Type, FOD6-1	0.0017	0.2841	0.59
Fresh-Moist Willow Lowland Deciduous Forest Type, FOD7-3	0.0895	4.2922	2.08
Fresh-Moist Poplar Deciduous Forest Type, FOD8-1	0.0942	4.4291	2.13
Dry-Fresh Sugar Maple – Hemlock Mixed Forest Type, FOM3-2	0.0000	0.0011	0.00
Dry-Fresh White Cedar – Poplar Mixed Forest Type, FOM4-2	0.1055	8.0326	1.31
Fresh-Moist White Cedar – Hardwood Mixed Forest Type, FOM7-2	0.0817	3.4011	2.40
Shrub Sand Barren Ecosite, SBS1	0.0000	0.1949	0.00
Total	1.2495	73.4400	

7.7 Land Use/Land Acquisition

Effect

- A. In general, the road reconstruction activities would occur within the existing The Gore Road right-of-way, however, temporary construction easements for working areas and some property acquisition to facilitate active transportation, improved ditches and improved vertical alignment will be required.

Mitigation

- A. Temporary construction easements and property acquisition will be minimized where possible. Any disturbed areas not required for the rehabilitation of The Gore Road will be restored to their original state where possible.

7.8 Human Health and Safety

Effect

- A. Potential safety hazard from construction activities, heavy equipment and increased traffic.

Mitigation

- A. The contractor will be required to implement a Health and Safety Plan (OHSA 1990).

8.0 Follow-up Commitments

The Region of Peel will remain in contact with various agencies including the TRCA to ensure that all requisite permits are obtained and construction associated with the improvements to The Gore Road is conducted according to recognized standards.

The following monitoring requirements should be in place and carried out throughout the duration of the project. The monitoring period should extend from just before mobilization by the contractor and ending one or two years following completion of the works depending on the length of the construction contract maintenance period.

- Preconstruction photographs, records and contact with existing residents should be made.
- Erosion and sedimentation controls should be inspected daily and following rain events during the resident inspection period by a Certified Inspector of Sediment and Erosion Control. Controls requiring repair or replacement should be addressed immediately.
- Traffic management conditions are to be assessed on a daily basis and adjustments made as necessary to ensure safe vehicle operation on the roadway.
- The boundaries of the road construction project are to be inspected weekly to ensure all works and materials are kept within the assigned limits of the project.
- One week following site restoration, review all seeding and sodding and landscaping to check for washouts or areas requiring remediation.
- During the contractor's maintenance period, all new vegetation and natural restoration must continue to be watered and monitored.

These monitoring activities should be carried out by on-site personnel and may take the form of photographs, inspection records, diary notes or correspondence. The records should be kept on file for a minimum of two years following completion of the works.

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

9.0 Public Consultation

Public consultation is a key component of the Municipal Class EA process. Agencies, which may have been interested in the proposed project, received a Notice of Study Commencement. These agencies were asked to comment on the following: their required level of involvement in this Class EA study, how this Class EA study might affect their mandated areas of responsibility, and how their concerns or comments could be addressed. The following departments/agencies received the commencement notice:

- Canadian Environmental Assessment Agency;
- Canada Transport Agency;
- Department of Fisheries and Oceans;
- Environment Canada;
- Health Canada;
- Parks Canada
- Transport Canada;
- Indian and Northern Affairs Canada;
- Ministry of Aboriginal Affairs;
- Ministry of Environment – EAAB;
- Ministry of Environment – Central Region,
- Ministry of Natural Resources– Aurora District;
- Ministry of Agriculture and Environmental Land Use & Policy;
- MMAH – Central Municipal Services Office;
- MMAH – Oak Ridges Moraine Policy Team;
- Ministry of Public Infrastructure and Renewal – Places to Grow;
- Ministry of Transportation – Central Region;
- Ministry of Tourism and Culture – Central Region;
- Niagara Escarpment Commission;
- Ontario Provincial Police;
- Ontario Realty Corporation;
- Union of Ontario Indians;
- Metis Nation of Ontario;
- Alderville First Nation;
- Beausoleil First Nation;
- Chippewas of Georgina Island First Nation;
- Chippewas of Mnjikaning First Nation (Rama);
- Curve Lake First Nation;
- Hiawatha First Nation;
- Mississaugas of the New Credit First Nation;
- Mississaugas of Scugog Island First Nation;

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

- Saugeen Ojibway First Nation;
- Six Nations of the Grand River;
- Toronto and Region Conservation Authority;
- Town of Caledon;
- Peel Regional Police;
- Peel District School Board;
- Peel Fire and Emergency Services;
- Region of Peel Ambulance Services;
- Dufferin-Peel Catholic District School Board;
- Dufferin-Peel Roman Catholic Separate School Board;
- Coalition of Concerned Citizens;
- The Humber Watershed Alliance;
- Caledon Countryside Alliance;
- Canada Pacific Railway;
- GO Transit;
- Ontario Power Generation;
- Bell Canada;
- BLINK Communications Inc.;
- MTS-Allstream;
- Rogers Communications;
- Telus communications;
- Enbridge Gas Distribution Inc.;
- Enbridge Pipelines Inc.;
- Hydro One Networks;
- Trans Canada Pipelines; and
- Trans-Northern Pipelines Inc.

A complete list of agency contacts is provided in Appendix D3.

The Notice of Commencement (NOC) was published in the Caledon Enterprise on November 9 and 16, 2010. The NOC was also sent to all stakeholders within the study area on The Gore Road. The Notice of Commencement newspaper advertisement and copies of the letters submitted to review agencies and stakeholders is provided in Appendix D1.

9.1 Summary of Issues and Resolutions

Forty formal agency comments were submitted in response to the Notice of Commencement. These comments can be found in Appendix D4 and are summarized in Table 8.1.

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

Table 9.1 Summary of Agency Comments and Responses

Agency	Comment	Response
BLINK Communication	November 10/10 – NOC comment form indicated that they have no concerns at the current time.	Comment noted.
Mississauga Fire & Emergency Services	November 10/10 – Advised that Fire & Emergency Services should be removed from the mailing list since study area is outside their territory. Advised that Peter Dundas from Region of Peel Ambulance Services should be circulated.	Comment noted.
Peel District School Board	November 12/10 – NOC comment form received requesting that they be kept informed.	Comment noted.
Ontario Provincial Police	November 15/10 – NOC comment form indicated that they wish to be kept informed, however they had no additional comments at the time.	Comment noted.
Trans Canada Pipeline	November 15/10 – NOC comment form indicated that they have no concerns at the current time.	Comment noted.
Town of Caledon	November 16/10 – NOC comment form indicated that careful consideration should be given to designing the intersection of The Gore Road and Hwy 9. November 30/10 – Email received indicating concerns with deteriorating pavement condition, sub-standard shoulder areas, lack of proper ditching, and visibility restrictions. February 21/12 – Memo providing items to follow-up on with respect to road improvements.	Comment noted. May 17/12 – Letter from Region of Peel responding to questions raised in February 21/12 memo.
Toronto and Region Conservation Authority	November 16/10 – Email received in response to the draft terms of reference. Noted that natural features, regulation limits and flood plain data was sent to the Region in May 2010. Indicated that a site visit with the TRCA is required in order to identify natural features that need to be considered in the preferred design.	November 23/11 – Email sent providing a list of reports available for comment including Stage 1 Archaeological Assessment, Tree Inventory, Butternut Health Assessment, Streetscaping, Breeding

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

Agency	Comment	Response
	<p>June 17/11 - Email received confirming site meeting with Region, Burnside and TRCA staff.</p> <p>June 27/11 – NOC comment form received indicating that a site visit was conducted. The findings of the site visit were provided in the “watercourse crossing table” as well as defined on a map showing the locations of the 10 watercourses within the study area.</p> <p>August 16/11 – Transmittal received indicating that the watercourse crossing table was updated to reflect the cold water timing window (June 15 – September 15). A second email of the same date was received indicating that a hydraulic analysis is required for any crossing that has an upstream drainage area greater than 50 ha.</p> <p>January 26/12 – Email asking for clarification of revised property requirements.</p> <p>December 19/11 – Letter received that included information that needs to be addressed in the various reports being prepared.</p> <p>January 4/12 – Letter received providing comments on the Geotechnical report. Indicated that potential hydrogeology issues will need to be resolved during detailed design. Environmental impacts will need to be mitigated and address in the EA and detailed design.</p> <p>February 22, 2013 – Letter received providing update to comments provided in December 19, 2011 based on receipt of draft SWM Report.</p>	<p>Bird Survey, Stormwater/Drainage Report, Existing Conditions Background Report, Cultural Heritage Report, PIC materials, Model Data, Landscape Plans, and proposed design works.</p> <p>January 16/12 – Email sent providing a copy of the preliminary design.</p> <p>January 31/12 – Email responding to January 26/12 email clarifying property requirements.</p> <p>March 2/12 – Letter sent via email providing responses to December 19/11 letter.</p>

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

Agency	Comment	Response
Indian & Northern Affairs Canada – Specific Claims Branch	November 18/10 – Email received indicating that local First Nations should be contacted directly. Web link provided to identify First Nations within the vicinity of the study area.	Comment noted.
Peel Regional Police Corporate Planning and Resources	November 18/10 – NOC comment form received indicating that they believe a positive benefit from this project will be the safe movement of the ever increasing flow of traffic on The Gore Road.	Comment noted.
Enbridge Gas Distribution Inc.	November 26/10 – Email received indicating that there is buried plant in several areas throughout the study area. January 5/11 – Buried plant was identified in the Hwy 9 corridor only. No plant in the study area.	Comment noted. Comment noted.
Dufferin – Peel Catholic District School Board	November 26/10 – NOC comment form received requesting that they be kept informed.	Comment noted.
Ministry of Environment Central Region	December 6/10 – Letter received provided a list of items to be addressed in the EA including ecosystem protection and restoration, surface water, groundwater, air quality, dust and noise, contaminated soils, mitigation and monitoring, planning and policy, class EA process, First Nations consultation. They also requested a draft copy of the EA prior to filing for 30 days to review and a final copy of the PFR and Notice of Completion.	Comment noted.
Parks Canada	December 8 / 10 – NOC comment form indicated that they have no concerns with this project.	Comment noted.
Telus Communication	December 16/10 – NOC comment form indicated that they have no concerns at the current time.	Comment noted.
Chippewas of Mnjikaning First Nation (Rama)	January 3/11 – Letter received indicating that all correspondence will be forwarded to their lawyer, Ms. Karry Sandy-McKenzie, for review	Comment noted.

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

Agency	Comment	Response
Ministry of Natural Resources Aurora District – Forester	November 11/10 – Email noting NOC received and that study area includes a number of sensitive areas and requested appropriate study and mitigation measures will be undertaken including search for sensitive species. January 5/12 – Responded to a request from Burnside for information regarding the Managed Forest Tax Incentive Program. Provided a link to the programs website.	Comment noted. Comments noted.
Ministry of Aboriginal Affairs (MAA) – Aboriginal and Ministry Relationships	January 11/11 – Letter received identifying First Nation and other Aboriginal Affairs departments that need to be consulted.	Comment noted
Transport Canada Ontario Region	January 17/11 – Email received indicating that a CEAA Screening should be prepared for any works within navigable waterways.	Comment noted.
Ministry of Natural Resources Aurora District – Species at Risk Biologist	May 24/11 – Letter received identifying Butternut, Bobolink, Snapping Turtle and sensitive plant species within the vicinity of the study area. A historic record of the Northern Map Turtle was also noted. A permit may be required if any works pose a harm to these species. May 10/13 – Email from J. Burkart noting Notice of PIC received advising to report and SAR to office. Noted tree removal and wetland disturbance should be avoided / minimised.	Comment noted. Comment noted.
Ministry of Transportation Central Region	July 26/11 – Email received advising that MTO has completed some existing condition analysis (collision, geometrics, operational analysis) at the intersection of Hwy 9 and The Gore Road. It was also noted that they are currently identifying design alternatives. November 30/11 – Email received indicating that a preferred alternative had not been identified to date.	July 26/11 – Email response sent to MTO from the Region, indicating that Burnside have been asked to focus on Patterson Road to Coolihans Sideroad, allowing tie in to the MTO design. The Region has requested to be kept informed of any progress of the MTO study.

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

Agency	Comment	Response
	January 17/13 – Email sent to S.Rook from J.Arcaro (consultant for MTO) providing an updated preliminary design drawing for Highway 9 / The Gore Road intersection showing separate right and left turn land on The Gore Road at the intersection.	
Rogers Communication	November 25/11 – NOC comment form indicated that they have no concerns at this time, but would like to be updated should plans change. January 02/12 – Email indicated buried plant in the Hwy 9 corridor only. No plant in the study area.	Comment noted. Comment noted.
Indian & Northern Affairs Canada – Litigation Management and Resolution Branch	December 9/11 – Letter received identifying the “Six Nations of the Grand River of Indians v. Attorney General For Canada and Her Majesty the Queen in the Right of Ontario, Ontario Superior Court of Justice, files in Brantford, court reference number 406/95 court case”; and the “Alderville Indian Band, Beausoleil Indian Band, Chippewas of Georgina Island Indian Band, Chippewas of Rama Indian Band, Hiawatha Indian Band, Mississaugas of Sugog Indian Band v. HMQ and Ontario (Third Party), Federal Court of Canada, Filed in Montreal, court reference #T-195-92 court case”.	Comment noted.
Infrastructure Ontario	December 14/11 – NOC comment form received indicating that there were no Ontario Realty Corp. lands in the vicinity of the study area.	Comment noted.
Hydro One Networks Inc.	December 17/11 – NOC comment form indicated that they have no concerns with the current plan. November 11/12 – Email received updating contact. May 10/13 – Email noting there are no Hydro One Transmission Facilities in subject area. A preliminary assessment, however no further	PIC / Preliminary design info to be sent to verify that there are no further concerns. Comment noted. Comment noted.

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

Agency	Comment	Response
	consultation required if no changes to current information.	
Bell Canada	January 10/12 – Email received indicating that there is no current plan to update plant throughout the study area. Bell currently has aerial and buried plant throughout the study area.	Comment noted. Bell plant will need to be relocated, but is considered minor in nature and a relocation should be straight forward.
Hydro One Inc.	January 16/12 – Email sent from Burnside summarizing earlier phone conversation. Hydro One has no future plans to upgrade its network along The Gore Road. Hydro One noted that, to be conservative, the Region should allow up to one year for Hydro One to develop a relocation plan. November 15/12 – Email providing markup of project area noting several poles will need to be changed to allow for proposed grading work and few moved to allow widening/ditching. November 19/12 – Email asking for clarification if there is a specific offset for poles from travelled portion of road. Second email clarifying that vast majority of poles can be returned to original locations after construction and poles. Only poles where property is being purchased will need to move.	Comment noted. November 16/12 – Email response asking for property required for pole relocations (if any). November 19/12 – Email noting that poles within 3 m from edge of driving lane or proposed ditch will need to be removed.
Peel Regional Paramedic Services	May 9/13 – Requested to be kept aware of closures, detours or hazards that would limit or impede access to area.	May 10/13 – Advised that Regional Paramedic Services would be kept apprised of any situation that may affect their services.
Alderville First Nation	July 11/13 – In accordance with Alderville First Nation Consultation Protocol, proposed project is deemed a level 3, having minimal potential to impact First Nations' rights. Asked to be kept apprised of any archaeological findings, burial sites or any environmental impacts, should any occur.	Comment noted.

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

A total of 20 comments have been received from public stakeholders in response to the Notice of Commencement (Appendix D5). Concerns were expressed with respect to visibility issues, speeding, heavy truck and vehicle traffic, pedestrian safety, safety entering and exiting driveways, drainage issues with culverts that need to be replaced, impacting the aesthetics and the natural environment of the existing area. The public also provided positive feedback related to the improvements south of the study area and would like to see them implemented in their area such as protective barriers and paving driveway entrances.

A draft copy of this Project File Report was provided to several agencies for review and comment including the Region of Peel environmental assessment, planning, traffic safety and active transportation staff, Toronto and Region Conservation Authority, Ministry of Environment Central Region, Ministry of Natural Resources Aurora District and the Town of Caledon Planning and Engineering Services Public Works Department. Correspondence relative to the draft Project File Report with these agencies is provided in Appendix D4.

9.2 Public Information Centre

A Notice of Public Information Centre (PIC) was sent to all agencies who may have been interested in the proposed project. The Notice of PIC was published in the Caledon Enterprise on May 9, 14, 16 and 21, 2013. The NOC was also sent to agencies and stakeholders that had expressed an interest in the project. The PIC was held on May 23, 2013 from 6:30 p.m. to 8:30 p.m. at the Caledon Community Complex. A PIC Summary Report was prepared and is included in Appendix D2. The PIC Summary Report includes a copy of the Notice of PIC, display boards, and comment received from the PIC.

Attendees were greeted, asked to sign the registration sheet, and were provided with a comment form. A total of 22 people attended the PIC. Six project team members from the Region and five project team members from Burnside were present. The Region and Burnside staff were available for questions during the course of the drop-in centre.

Participants were requested to provide input by completing the available comment forms. If individuals wished to take comment forms home to fill out later, they were requested to return their comments, at the address provided on the comment sheet, by June 6, 2013. General agreement with the preliminary design was provided by the attendees.

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

A total of one comment form was received and responded to by the Region (Appendix D2). Key issues addressed within the written response relate to:

- Impacts to property (due to grading, tree removal, increased noise, dust, and loss of land); and,
- Safety concerns related to sightlines at property entrance.

9.3 The Notice of Completion

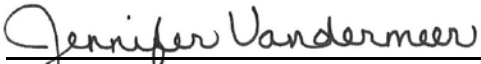
Completion of this Municipal Class EA will be prepared and published in the Caledon Enterprise. The Notice will also be mailed to all agencies and stakeholders that had expressed an interest in the project.

If concerns arise regarding this project which cannot be resolved in discussion with the Region, a person or party raising the objection may request the proponent to voluntarily conduct a higher level study (i.e. Schedule B project to Schedule C or Schedule B or Schedule C project to an individual environmental assessment). If the Region declines this request, the person/party with the concern may request that the Minister of Environment make an Order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses individual Environmental Assessments. Requests must be received by the Minister within 30 calendar days of the Notice of Completion.

If the Minister does not receive Part II orders regarding this project, then the project will continue forward to detailed design/approvals and ultimately construction subject to budget availability.

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

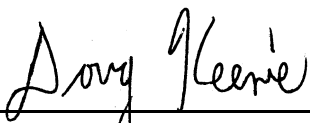
Written by:

Signature  Date November 1, 2013
Jennifer Vandermeer, P.Eng.
Environmental Engineer
R.J. Burnside & Associates Limited

Signature  Date November 1, 2013
Dominique Evans
Environmental Technologist
R.J. Burnside & Associates Limited

Reviewed and Approved by:

Signature  Date November 1, 2013
Leonard Rach, P.Eng
Project Manager
R.J. Burnside & Associates Limited

Signature  Date November 1, 2013
Doug Keenie, P.Eng
Project Director
R.J. Burnside & Associates Limited

The Gore Road Improvements from Patterson Sideroad to Highway 9
November 2013

10.0 References

Archaeological Assessments Ltd. (March 2011). Report on the Stage 1 Archaeological Assessment of The Gore Road Improvements, From Patterson Side Road to Highway 9, Town of Caledon, Regional Municipality of Peel.

Burnside (May 2011). The Gore Road Structure and Culvert Inspections Report.

Lee, H.T., et al. (1998). Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer branch. SCSS Field Guide FG-02.

Ministry of Natural Resources. Natural Heritage Information Centre. Accessed at <http://nhic.mnr.gov.on.ca/MNR/nhic/queries/geographic.cfm>.

North-South Environmental Inc. (November 2011). The Gore Road Breeding Bird Survey.

Region of Peel (August 2010). Road Safety Audit – The Gore Road EA Project #10-4385 Reconstruction from Patterson Sideroad to Highway 9.

Regional Municipality of Peel (August 2010). The Gore Road Class EA Study Reconstruction from Patterson Sideroad to Highway #9 – Traffic Analysis Report.

Statistics Canada. (N.D.). 2006 Census Data. Downloaded January 18, 2011 from <http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm>

Statistics Canada. (N.D.). 2001 Census Data. Downloaded January 18, 2011 from <http://www12.statcan.ca/english/Profil01/CP01/Index.cfm?Lang=E>

Unterman McPhail Associates (November 2011). Existing Conditions: Built Heritage & Cultural Heritage Landscapes.

Unterman McPhail Associates (November 2011). Cultural Heritage Resources Assessment Report – Built Heritage Resources & Cultural Heritage Landscapes.