

4 EXISTING CONDITIONS

4.1 PROVINCIAL POLICY FRAMEWORK

4.1.1 Provincial Policy Statement

The Provincial Policy Statement, 2005 (PPS), issued under Section 3 of the Planning Act, provides policy direction related to land use planning and development in Ontario. Five general principles are established in the PPS that are further elaborated on in a detailed set of policies that generally address the following matters:

1. *Building Strong Communities;*
2. *Wise Use and Management of Resources; and*
3. *Protecting Public Health and Safety.*

The PPS provides the following policies regarding the provision of transportation infrastructure to support future urban development:

PPS Section 1.6 Infrastructure and Public Service Facilities

1.6.5 Transportation Systems

- 1.6.5.1 *Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs.*

PPS Section 1.7 Long-Term Economic Prosperity

1.7.1 Long term economic prosperity will be supported by:

- d. *providing for an efficient, cost-effective, reliable multi-modal transportation system that is integrated with adjacent systems and those of other jurisdictions, and is appropriate to address projected needs.*
- e. *planning so that major facilities (such as airports, transportation/transit/rail infrastructure and corridors, intermodal facilities, sewage treatment facilities, waste management systems, oil and gas pipelines, industries and resource extraction activities) and sensitive land uses are appropriately designed, buffered and/or separated from each other to prevent adverse effects from odour, noise and other contaminants, and minimize risk to public health and safety.*

Also of immediate importance in the Burnhamthorpe Road EA Study are the PPS policies related to natural heritage (s. 2.1) and natural hazards (s. 3.1).

4.1.2 Greenbelt Plan

The lands within the Study Area south of Highway 407, just east of Bronte Road are designated Protected Countryside within the Greenbelt Plan area and Parkway Belt West Plan area. Section 4.2 of the Greenbelt Plan provides the policies that apply to lands falling within the Protected Countryside with respect to infrastructure.

4.2.1 General Infrastructure Policies

- *All existing, expanded or new infrastructure subject to and approved under the Canadian Environmental Assessment Act, the Environmental Assessment Act, the Planning Act, the Aggregate Resources Act, the Telecommunications Act or by the*

National or Ontario Energy Boards, or which receives a similar environmental approval, is permitted within the Protected Countryside, subject to the policies of this section and provided it meets one of the following two objectives:

- *It supports agriculture, recreation and tourism, rural settlement areas, resource use or the rural economic activity that exists and is permitted within the Greenbelt; or*
 - *It serves the significant growth and economic development expected in southern Ontario beyond the Greenbelt by providing for the appropriate infrastructure connections among urban growth centres and between these centres and Ontario's borders.*
- *The location and construction of infrastructure and expansions, extensions, operations and maintenance of infrastructure in the Protected Countryside, are subject to the following:*
 - *Planning, design and construction practices shall minimize, wherever possible, the amount of the Greenbelt, and particularly the Natural Heritage System, traversed and/or occupied by such infrastructure;*
 - *Planning, design and construction practices shall minimize, wherever possible, the negative impacts and disturbance of the existing landscape, including, but not limited to, impacts caused by light intrusion, noise and road salt;*
 - *Where practical, existing capacity and coordination with different infrastructure services is optimized so that the rural and existing character of the Protected Countryside and the overall urban structure for southern Ontario established by the Greenbelt and any provincial growth management initiatives are supported and reinforced;*
 - *New or expanding infrastructure shall avoid key natural heritage features or key hydrologic features unless need has been demonstrated and it has been established that there is no reasonable alternative; and*
 - *Where infrastructure does cross the Natural Heritage System or intrude into or result in the loss of a key natural heritage feature or key hydrologic feature, including related landform features, planning, design and construction practices shall minimize negative impacts and disturbance on the features or their related functions, and where reasonable, maintain or improve connectivity.*

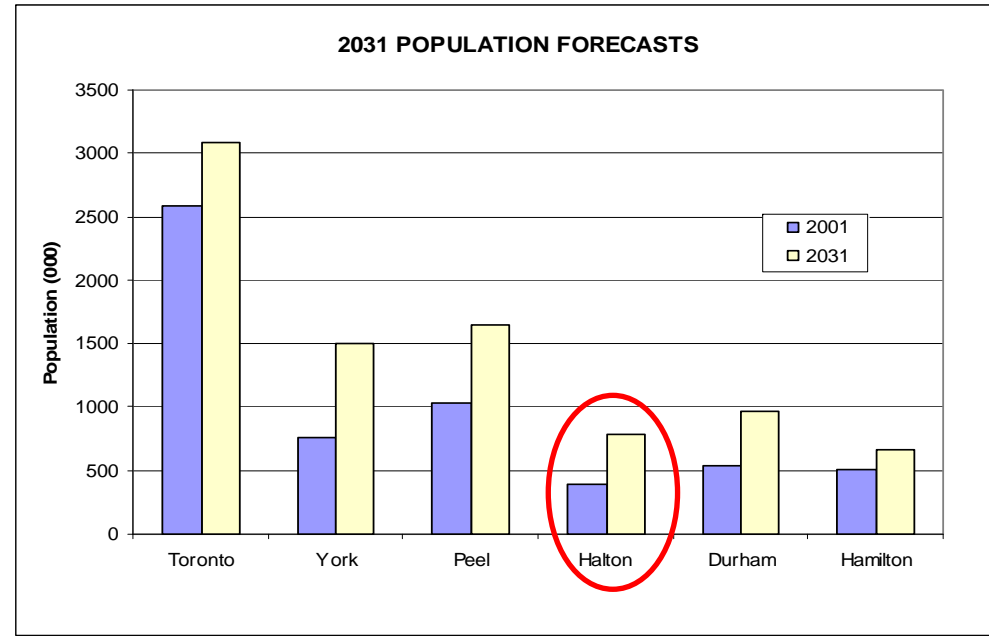
4.1.3 The Growth Plan for the Greater Golden Horseshoe

The Ministry of Infrastructure and Renewal's Growth Plan for the Greater Golden Horseshoe (Growth Plan), established under the Places to Grow Act, implements the Province's vision for managing growth and developing stronger communities. The Growth Plan guides decisions on a wide range of issues including economic development, land-use planning, urban form, housing, natural heritage and natural resource protection, provincial infrastructure planning, and the development of municipal official plans and local servicing and implementation strategies.

The Growth Plan builds on other key Provincial initiatives including the Greenbelt Plan and the PPS. The Growth Plan addresses areas of common interest over the entire Greater Golden Horseshoe. It also sets out criteria and the process for the completion of five sub-area growth strategies to address common policy issues at a geographic scale

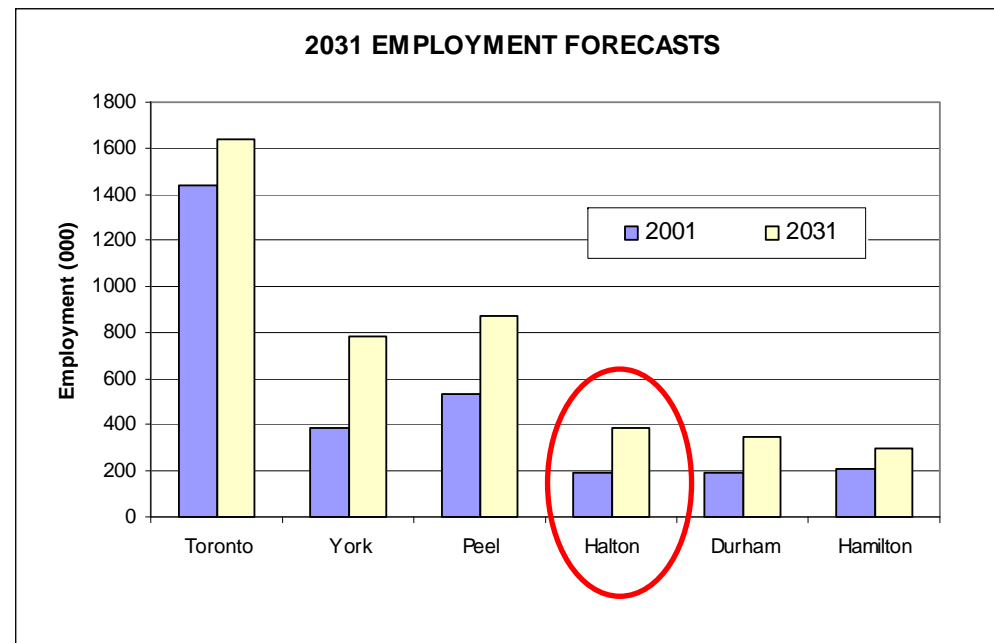
beyond municipal boundaries. Halton is expected to double its population to 780,000 by 2031, and the number of jobs will increase to 390,000. **Exhibit 4-1** and **Exhibit 4-2** illustrate the population and employment forecasts for Greater Golden Horseshoe municipalities to the year 2031.

Exhibit 4-1: 2031 Population Forecasts



Source: Growth Plan for the Greater Golden Horseshoe

Exhibit 4-2: 2031 Employment Forecasts



Source: Growth Plan for the Greater Golden Horseshoe

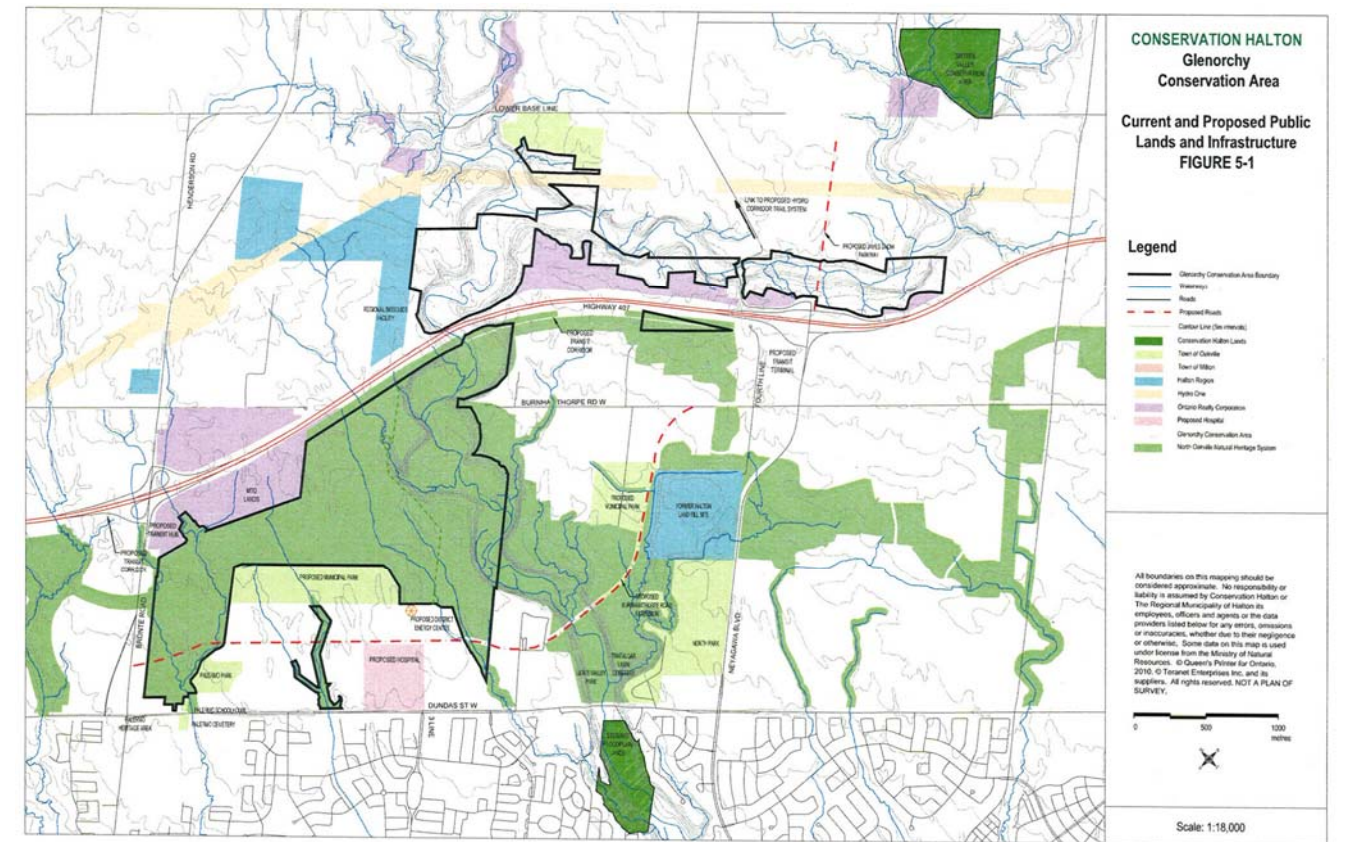
4.1.4 The Ministry of Natural Resource's Greenspace Protection

On November 5, 2004, the Ontario Ministry of Natural Resources (MNR) announced public open space protection of 303 ha (750 ac) of the Oakville Land Assembly lands. The Oakville Land Assembly (OLA) is an area of 451 ha (1,115 ac) of Provincially owned land bounded by Highway 407 to the north, Dundas Street to the south, Sixteen Mile Creek to the east and Bronte Road to the west. The OLA forms the majority of the western portion of the Study Area for this project. Conservation Halton partnered with the Government of Ontario to protect these lands, known now as the Glenorchy Conservation Area.

A master plan for the Glenorchy Conservation Area was approved by the Conservation Halton Board of Directors in February 2010. The NNOTC is recognized and illustrated in the Glenorchy Master Plan. Section 5.1.1.2 of the master plan recognizes the re-alignment of Burnhamthorpe Road (NNOTC) such that it passes through the Glenorchy Conservation Area in two places, as illustrated in **Exhibit 4-3**. The master plan indicates that Conservation Halton will work with Halton Region and other appropriate agencies to ensure that the environmental impact of the realignment of Burnhamthorpe Road (NNOTC) is minimal, that site rehabilitation is thorough, or that comparable compensation is made.

Of the remaining 147 ha (365 ac) OLA lands outside of the MNR protected area, 20 ha (50 ac) have been designated for a future hospital site, 15 ha (38 ac) have been reserved for a potential rapid transit system along Highway 407, and 112 ha (277 ac) will be made available for purchase.

Exhibit 4-3: Glenorchy Conservation Area - Current & Proposed Public Lands & Infrastructure



4.2 NATURAL ENVIRONMENT

Existing conditions of the natural environment within the Study Area were identified based on a review of secondary source information and desktop analysis. Field investigations were completed to supplement existing secondary source information to ensure that data was comparable across the Study Area and, at the same time, detailed enough to facilitate an impact assessment of the alternative methods. Field work was completed during the period between June 2004 and June 2006. Where feasible, field investigations focused on potential alignments crossing the Sixteen Mile Creek valley, including tableland portions that support natural area contiguous with the valleylands.

The following existing documentation was reviewed:

- Gartner Lee Limited 2002. Rationale and Methodology for Determining Significant Woodlands in the Regional Municipality of Halton: Technical Background Paper #6. April 2002.
- Gartner Lee Limited 2004. Widening of the Queen Elizabeth Way between Trafalgar Road and Third Line, Oakville, Ontario. June 2004.
- Gore & Storrie Limited and Ecoplans Limited 1996. Sixteen Mile Creek Watershed Plan. February 1996.
- Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Science Station, Science Development and Transfer Branch. SCSS Field Guide FG-02.
- LGL Environmental Research Associates 1999. North Oakville Natural Heritage Inventory and Analysis. Project TA-2242. May 1999.
- Marshall Macklin Monaghan Limited and LGL Environmental Research Associates 1992. Joshua's Creek Watershed Plan Study. May 1992.
- Parish Geomorphic 2002. Trafalgar Moraine Delineation. January 2002.
- SNC – Lavalin Ferroviaire 1999. Highway 407 West Section, Freeman Interchange to Oakville Link with Highway 403: Fish and Habitat, 1999 Review of Existing Conditions. September 1999.
- Town of Oakville 2006. North Oakville Creeks Subwatershed Study (NOCSS). August 2006.

Vegetation

Field investigations were completed on nine occasions between June 10, 2005 and June 2, 2006 to document existing flora species and classify vegetation communities within the Sixteen Mile Creek Valley and associated tablelands. Vegetation community descriptions were based on the Ecological Land Classification (ELC) System for Southern Ontario (Lee *et al.*, 1998). This is the provincially accepted standard for classifying vegetation communities in Ontario; based on this standard, vegetation communities were identified down to Vegetation type where possible. Information regarding the structure and composition of these vegetation units included information describing dominant species, cover, community structure, community disturbance and other notable features. Vegetation communities were visited twice during each of the Spring, Summer and Autumn seasons to document the peak flowering season for all Terrestrial and Wetland Community Series encountered. All field investigations were preceded by air-photo interpretation and classification to the broad ELC category of Community Series where possible.

Breeding Birds

Breeding bird surveys were carried out by Gartner Lee Limited (GLL) biologists on six dates in the Spring (May to June) of 2004, 2005 and 2006. During the spring season, breeding birds are present on breeding territories and are readily identified by song and other breeding behaviours. Completion of six surveys provided diligent coverage of Sixteen Mile Creek Valley and optimized chances of compiling a complete record of all birds present. The survey method was based on the Ontario Breeding Bird Atlas. Birds identified during walking surveys that optimized coverage

of the valley. All species seen or heard were recorded by location and were considered to be breeding species unless otherwise noted (i.e., some species observed during the May 1, 2006 visit were considered migrants).

Amphibians

GLL ecologists conducted nocturnal amphibian calling surveys at 11 stations throughout Sixteen Mile Creek Valley and adjacent tablelands. Each site was visited on two separate occasions in an attempt to record the presence of amphibian species which call at different times during the breeding season. The methodology was based on the Marsh Monitoring Protocol and the call count manual by the Ontario Task Force on Declining Amphibian Populations, modified to include two site visits (Gartshore *et al.*, 2000). At each station all calling frogs and toads were recorded. Species and numbers of individuals were documented. When too many individuals of one species were calling, making it difficult to detect and separate individuals and, to estimate their number, they were recorded as a chorus.

Gartshore *et al.* (2000) recommend three site visits and provide the following date and night-time air temperature guidelines to inform timing of the surveys in Southern Ontario:

- Survey #1 - April 1 to 15; 5 to 12 degrees Celsius;
- Survey #2 - May 1 to 15; 10 to 20 degrees Celsius; and,
- Survey #3 - June 1 to 15; 17 to 28 degrees Celsius.

AECOM ecologists tracked weather conditions and amphibian calling activity to optimise survey efforts. As a result, two surveys were completed on the following dates and night-time air temperatures:

- a) Survey #1 – May 1; 7 degrees Celsius; and,
- b) Survey #2 – June 22; 20 degrees Celsius.

Call surveys were coupled with mapping of all incidental observations.

Snakes

Correspondence with the OMNR (2006c) identified a recent record (1988) of the provincially significant milksnake (*Lampropeltis triangulum*) at one location near Sixteen Mile Creek valley. Milksnakes are considered a relatively secretive snake species and are frequently discovered beneath objects in direct sunlight, absorbing heat from the underside (Environment Canada 2006).

GLL established 22 artificial cover habitats on March 16, 2006 to establish fixed sampling stations throughout Sixteen Mile Creek valley and associated tablelands. Artificial cover habits were constructed of black landscaping geotextile typically used for weed suppression purposes, and were fixed to the ground using a textile pegs, rocks and logs as necessary. All cover sampling stations were a minimum of 1 m long by 0.5 m wide.

The results of the natural environment review are summarized in the following sub-sections.

4.2.1 Fisheries and Aquatic Habitat

Past studies are summarized in the following sections to characterize watercourses throughout the Study Area. In addition to these watercourses, a number of poorly defined agricultural swales and ditches are located throughout the Study Area. These systems receive intermittent flow, and for a variety of reasons do not provide sufficient habitat to support fish (LGL 1999). A number of permanent and ephemeral ponds also exist throughout the Study Area.

Sixteen Mile Creek

Sixteen Mile Creek is the largest watercourse in the Study Area and is designated “Greenlands A” and “Greenlands B” in Halton Region’s Official Plan. It includes three main branches forming a confluence north of Burnhamthorpe Road between Neyagawa Boulevard and Regional Road 25. Upstream reaches of the two western branches exhibit cool to coldwater temperatures and support brook trout and brown trout residents and migratory occurrences of rainbow trout. Tributaries of the eastern branches support resident populations of the nationally rare, redbreasted dace (Town of Oakville, 2002). The middle and east tributaries occurring to the north of Highway 407 (north of the Study Area) support resident populations of redbreasted dace (*Clinostomus elongates*) (Town of Oakville 2006f).

Sixteen Mile Creek becomes a deeply incised warm to cool water stream within the Study Area and supports resident populations of smallmouth bass and migratory runs of rainbow trout, Chinook salmon and coho salmon (LGL 1999).

Gore & Storrie and Ecoplans (1996) completed a benthic community analysis for the entire course of Sixteen Mile Creek. Results indicate a continuum of relatively undisturbed water with low turbidity in the upper reaches to nutrient enriched and turbid water in the lower reaches.

Morrison Creek

Morrison Creek originates in two branches south of Burnhamthorpe Road within the Study Area and eventually feeds into Sixteen Mile Creek. Both branches are ploughed through in large sections. The western reach supports flow throughout most of the year, although the water course is dammed immediately above and below Dundas Street (Town of Oakville 2006f). Flow within the eastern reach is intermittent (Town of Oakville 2002). Reports of redbreasted dace downstream of the Study Area indicate potential coldwater habitat in the lower reaches of Morrison Creek (LGL 1999).

McCraney Creek

McCraney Creek functions primarily as an ephemeral agricultural swale with little natural vegetation cover or fish habitat (LGL 1999 and Town of Oakville 2006). LGL (1999) report no fisheries potential for the agricultural swales. McCraney creek is channelized and ploughed throughout the Study Area, except within the lower reaches (near Dundas Street), where limited riparian vegetation occurs.

Taplow Creek

Taplow Creek functions primarily as an ephemeral agricultural swale devoid of any substantial vegetation cover with the exception of on small woodlot (LGL 1999 and Town of Oakville 2006). The Town of Oakville (2003) identifies four fish inventories (Trichon *et al.* 1992, Marshall Macklin Monaghan & LGL 1992, SNC Lavalin – Ferrovia 1999, and LGL 1999) along this reach.

Glen Oaks

Glen Oaks functions primarily as an ephemeral agricultural swale void of any substantial vegetation cover (LGL 1999 and Town of Oakville 2003). The Town of Oakville (2003) identifies four fish inventories (Trichon *et al.* 1992, Marshall Macklin Monaghan & LGL 1992, SNC Lavalin – Ferrovia 1999, and LGL 1999) along this reach.

Shannon’s Creek

Shannon’s Creek functions primarily as an ephemeral agricultural swale within the Study Area (LGL 1999 and Town of Oakville 2003). Little fisheries information exists for this reach and no fish potential has been identified (LGL 1999).

Munn’s Creek

Munn’s Creek functions primarily as an ephemeral agricultural swale within the Study Area (LGL 1999 and Town of Oakville 2003). Little fisheries information exists for this reach and no fish potential has been identified (LGL 1999).

Joshuas Creek

Joshuas Creek is the second largest system in the Study Area and is designated as “Greenlands A” in Halton Region’s Official Plan. Marshall Macklin Monaghan and LGL (1992) and LGL (1999) recorded only warm water tolerant fish species in this watercourse, indicating limited fisheries potential. Upper reaches of Joshua’s Creek experience seasonal flow and little groundwater contribution to baseflow (LGL 1999); lower reaches occurring within the Oakville urban matrix have been altered and channelized. The Town of Oakville (2006f) report indicates intermittent to near permanent flow with little groundwater contribution. The presence of white sucker indicates at least limited spawning access from Lake Ontario (LGL 1999).

Fourteen Mile Creek

The headwaters of Fourteen Mile Creek originate primarily west of the Study Area, with a main branch and tributary running through the southwest portion of the Study Area. Fourteen Mile Creek runs in a north – south direction, ultimately out-letting into Lake Ontario. Creek portions occurring within the Study Area cross are buffered by cultural meadow and forest communities. The main branch and tributary form a confluence immediately upstream of an online pond at Dundas Street. Water temperatures recorded on May 23, 2002 ranged between 22 degrees Celsius in the agricultural fields south of Highway 407, and 23 degrees Celsius in the meadow communities north of Dundas Street (Town of Oakville 2003a). Previous studies report the presence of redbreasted dace (LGL 1999; Town of Oakville 2006f) in the watershed.

4.2.2 Vegetation and Terrestrial Habitat

Existing land use is dominated by agriculture and includes approximately ten percent coverage of scattered woodlots and wetlands (Town of Oakville 2002). A variety of other habitat types exist including pasture, hedgerow, pioneer communities and prairie ecosystems (LGL 1999 and Gore & Storrie and Ecoplans 1996). The Study Area is bound by dense urban developments to the south and fragmented by regional roads throughout. Vegetated creek corridors maintain connectivity between habitat patches throughout the Study Area and on adjacent lands.

LGL (1999) reports a pre-settlement forest cover over the entire extent of the Study Area with dry sites dominated by oak (*Quercus spp.*) and hickory (*Carya spp.*) species and fresh sites by mixed hardwood stands. Pockets of savannah and tallgrass prairie communities have suspected historical occupation of dry regions along the south-facing valley slopes of Sixteen Mile Creek within the Study Area (historically maintained by erosional processes, drought, and periodic fire).

Oak and hickory species are currently well represented in the Study Area, however shade-tolerant hardwood regeneration, including Sugar Maple (*Acer saccharum spp. Saccharum*), American Beech (*Fagus grandifolia*) and White Ash (*Fraxinus Americana*) is compromising historical community composition. Dry valley rims and bluffs along Sixteen Mile Creek, and dry tablelands include some species with prairie and savannah affinities. Fresh sites support hardwood associations including:

- Sugar Maple
- Red Maple (*Acer rubrum*)
- Shagbark Hickory (*Carya ovata*)
- Basswood (*Tilia Americana*)
- Red Oak (*Quercus rubra*)
- Bur Oak (*Quercus macrocarpa*)

- White Oak (*Quercus alba*)
- American Beech
- White Ash
- Ironwood (*Ostrya virginiana*)
- Muscle-wood (*Carpinus caroliniana*).

Green Ash (*Fraxinus pennsylvanica*), Yellow Birch (*Betula alleghaniensis*) and White Birch (*Betula papyrifera*) are abundant on lower slopes and fresh to moist depressions. Poorly drained depressions in upland habitats support swamp communities dominated by Swamp Maple (*Acer x freemanii*), Black Ash (*Fraxinus nigra*), Green Ash and thicket species including shrub Willows (*Salix spp.*), Dogwoods (*Cornus spp.*), Winterberry (*Ilex verticillata*) and Buttonbush (*Cephalanthus occidentalis*).

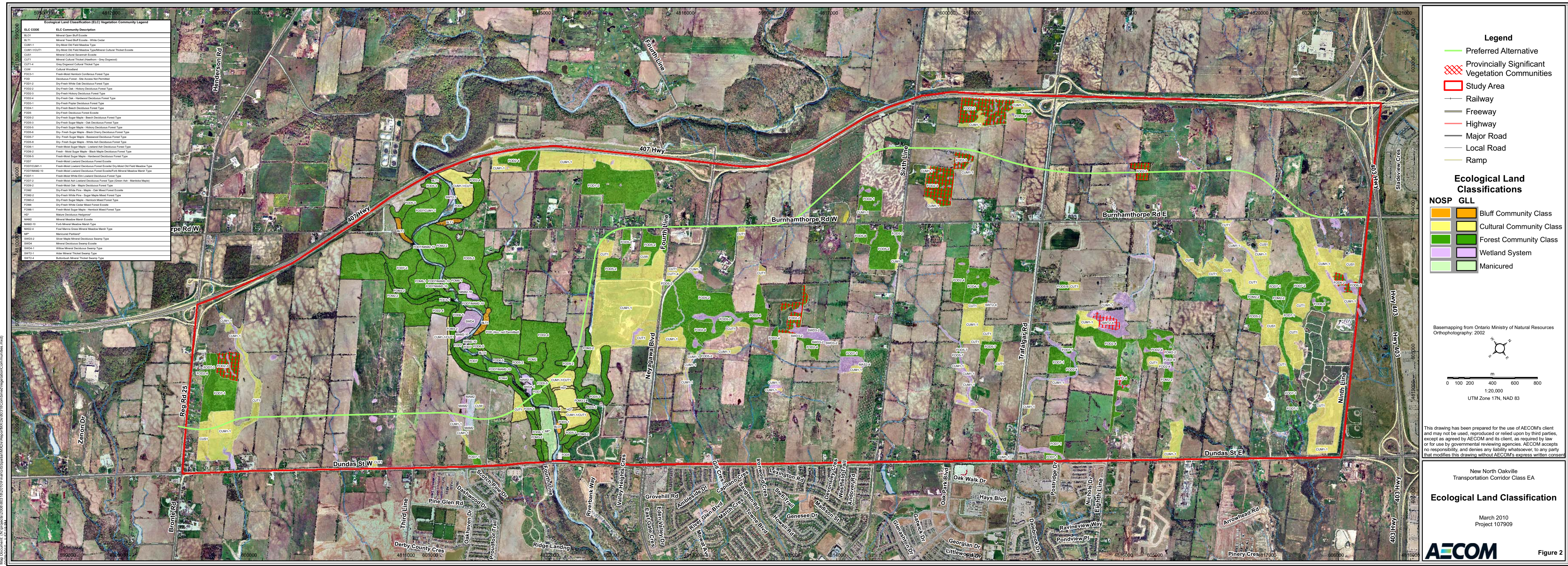
Previous studies provide ELC community classification developed by Lee *et. al.* (1998) (LGL 1999; Natural Resource Solutions 2002; Town of Oakville 2003); LGL 1999 provides community series ELC mapping for the entire Study Area; Natural Resource Solutions (2002) and the Town of Oakville (2003) provide vegetation type ELC mapping for selected natural areas south of Highway 407. LGL (1999) and the Town of Oakville (2002 and 2003) report three significant vegetation communities within the Study Area: Dry-Fresh Oak-Hickory Deciduous Forest (FOD2-2), Dry-Fresh Hickory Deciduous Forest (FOD 2-3) and Buttonbush Mineral Thicket Swamp (SWT2-4), are ranked uncommon and rare, respectively, by the Natural Heritage Information Centre (NHIC) database. Community series ELC mapping was obtained from Conservation Halton.

All but one woodlot surveyed by the Town of Oakville in 2002 and 2003 were considered significant woodlands according to criteria established for Halton Region by Gartner Lee Limited (2002). It should be noted that Halton Region uses four of the seven criteria recommended by Gartner Lee Limited (2002). Woodlot surveys using the Region accepted criteria would not identify significant woodlots.

LGL (1999) and the Town of Oakville (2002 and 2003) report four provincially significant vegetation communities within the Study Area (with corresponding NHIC database rankings):

- Dry-Fresh Oak-Hickory Deciduous Forest (FOD2-2, rare to uncommon);
- Dry-Fresh Hickory Deciduous Forest (FOD2-3, rare to uncommon);
- Fresh-Moist Sugar Maple-Black Maple Deciduous Forest (FOD6-2, rare to uncommon); and,
- Buttonbush Mineral Thicket Swamp (SWT2-4, rare to uncommon)

All other Vegetation Types are common and widespread in southern Ontario according to the NHIC database (ranked S4 or S5). **Exhibit 4-4** provides a map with all vegetation communities within the Study Area.



Ecological Land Classification (ELC) Vegetation Community Legend

ELC CODE	ELC Community Description
BL01	Mineral Open Bluff Ecotope
BL01	Mineral Open Bluff Ecotope - White Cedar
CUM1-1	Dry-Most Old Field Meadow Type
CUM1-1CUT1	Dry-Most Old Field Meadow Type/Mineral Cultural Thicket Ecotope
CUS1	Mineral Cultural Thicket (Hawthorn - Grey Dogwood)
CUT1	Mineral Cultural Thicket (Hawthorn - Grey Dogwood)
CUT1-4	Grey Dogwood Cultural Thicket Type
CLW	Cultural Woodland
FO03-1	Fresh-Most Hemlock Coniferous Forest Type
FO03	Deciduous Forest - Site Access Not Permitted
FO02-1	Dry-Fresh White Oak Deciduous Forest Type
FO02-2	Dry-Fresh Oak - Hickory Deciduous Forest Type
FO02-3	Dry-Fresh Hickory Deciduous Forest Type
FO02-4	Dry-Fresh Oak - Hardwood Deciduous Forest Type
FO03-1	Dry-Fresh Poplar Deciduous Forest Type
FO04-1	Dry-Fresh Beech Deciduous Forest Type
FO05	Dry-Fresh Deciduous Forest Ecotope
FO05-2	Dry-Fresh Sugar Maple - Beech Deciduous Forest Type
FO05-3	Dry-Fresh Sugar Maple - Oak Deciduous Forest Type
FO05-5	Dry-Fresh Sugar Maple - Hickory Deciduous Forest Type
FO05-6	Dry-Fresh Sugar Maple - Black Cherry Deciduous Forest Type
FO05-7	Dry-Fresh Sugar Maple - Basswood Deciduous Forest Type
FO05-8	Dry-Fresh Sugar Maple - White Ash Deciduous Forest Type
FO06-1	Fresh-Most Sugar Maple - Lowland Ash Deciduous Forest Type
FO06-2	Fresh-Most Sugar Maple - Black Maple Deciduous Forest Type
FO06-5	Fresh-Most Sugar Maple - Hardwood Deciduous Forest Type
FO07	Fresh-Most Lowland Deciduous Forest Ecotope
FO07/CUM1-1	Fresh-Most Lowland Deciduous Forest Ecotope/Dry-Most Old Field Meadow Type
FO07/MAM2-10	Fresh-Most Lowland Deciduous Forest Ecotope/Forb Mineral Meadow Marsh Type
FO07-1	Fresh-Most White Elm Lowland Deciduous Forest Type
FO07-2	Fresh-Most Ash Lowland Deciduous Forest Type (Green Ash - Maritima Maple)
FO07-3	Fresh-Most Oak - Maple Deciduous Forest Type
FO07-4	Dry-Fresh White Pine - Maple - Oak Mixed Forest Ecotope
FO07-5	Dry-Fresh White Pine - Sugar Maple Mixed Forest Type
FO08-2	Dry-Fresh Sugar Maple - Hemlock Mixed Forest Type
FO08-4	Dry-Fresh White Cedar Mixed Forest Ecotope
FO08-1	Fresh-Most Sugar Maple - Hemlock Mixed Forest Type
HD	Mature Deciduous Hedgerow
MAM2	Mineral Meadow Marsh Ecotope
MAM2-10	Forb Mineral Meadow Marsh Type
MAM2-4	Forb Mineral Meadow Marsh Type
MP	Mineral Pasture
SWD3-2	Shrub Marsh Mineral Deciduous Swamp Type
SWD4	Mineral Deciduous Swamp Ecotope
SWD4-1	Willow Mineral Deciduous Swamp Type
SWT2-1	Alder Mineral Thicket Swamp Type
SWT2-4	Butcherbush Mineral Thicket Swamp Type

- Legend**
- Preferred Alternative
 - Provincially Significant Vegetation Communities
 - Study Area
 - Railway
 - Freeway
 - Highway
 - Major Road
 - Local Road
 - Ramp

Ecological Land Classifications

NOSP	GLL	Community Class
		Bluff Community Class
		Cultural Community Class
		Forest Community Class
		Wetland System
		Manicured

Basemapping from Ontario Ministry of Natural Resources Orthophotography, 2002

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New North Oakville
Transportation Corridor Class EA

Ecological Land Classification

March 2010
Project 107909

4.2.3 Wetlands and Environmentally Sensitive Areas

Sixteen Mile Creek Regionally Significant Life Science ANSI/Sixteen Mile Creek Valley ESA

The Sixteen Mile Creek Valley has been designated as a regionally significant Life Science ANSI since 1984. It is also considered an ESA by the Region of Halton. This corridor is considered to have the highest quality and largest valley forest types within the Trafalgar Moraine and Peel Plain Physiographic Regions.

In general, valley slopes with southern aspects support high quality deciduous forests and prairie communities. Observed species with southern affinities include black maple (*Acer saccharum ssp. nigrum*), white oak, black oak (*Quercus velutina*), chinquapin oak (*Quercus muehlenbergii*), shagbark hickory, bitternut hickory (*Carya cordiformis*), sassafras (*Sassafras albidum*), and moonseed (*Menispermum canadense*). Valley slope forests with northern exposures and tableland communities are dominated by sugar maple, red oak, and white pine (*Pinus strobus*), and also include white birch and eastern hemlock (*Tsuga canadensis*) as common associates. Floodplain communities are dominated by shrub willow and dogwood communities.

Oakville-Milton Wetlands and Uplands Candidate Life Science ANSI

A large number of small wetlands (under 2 ha) are scattered throughout the Study Area (as shown on **Exhibit 4-6**) including pitted depression wetlands associated with the Trafalgar Moraine. All North Oakville – Milton Wetlands are isolated or palustrine wetland types occurring exclusively on mineral substrates and are typically dry by midsummer.

Trafalgar Moraine Candidate Earth Science ANSI

The moraine is relatively well drained, forming the headwaters of Fourteen Mile Creek, McCraney Creek, Shannon's Creek, Munn's Creek, Morrison Creek, and Joshua's Creek. The east branch of Sixteen Mile Creek originating north of 407 ETR is deflected in a westerly course upon approaching the moraine. It then converges with the main branch of Sixteen Mile Creek, cutting through the moraine and exposing the Queenstone Shale bedrock. This creates the effect of gorges, with unique vegetation niches, within the Study Area.

Provincially Significant Wetlands

Recent evaluation by MNR classified some of the wetlands within the Study Area as Provincially Significant Wetlands (PSW).

Exhibit 4-5 shows the locations of ANSIs and wetlands within North Oakville and vicinity.

Exhibit 4-5: North Oakville & Vicinity Wetlands & ANSIs

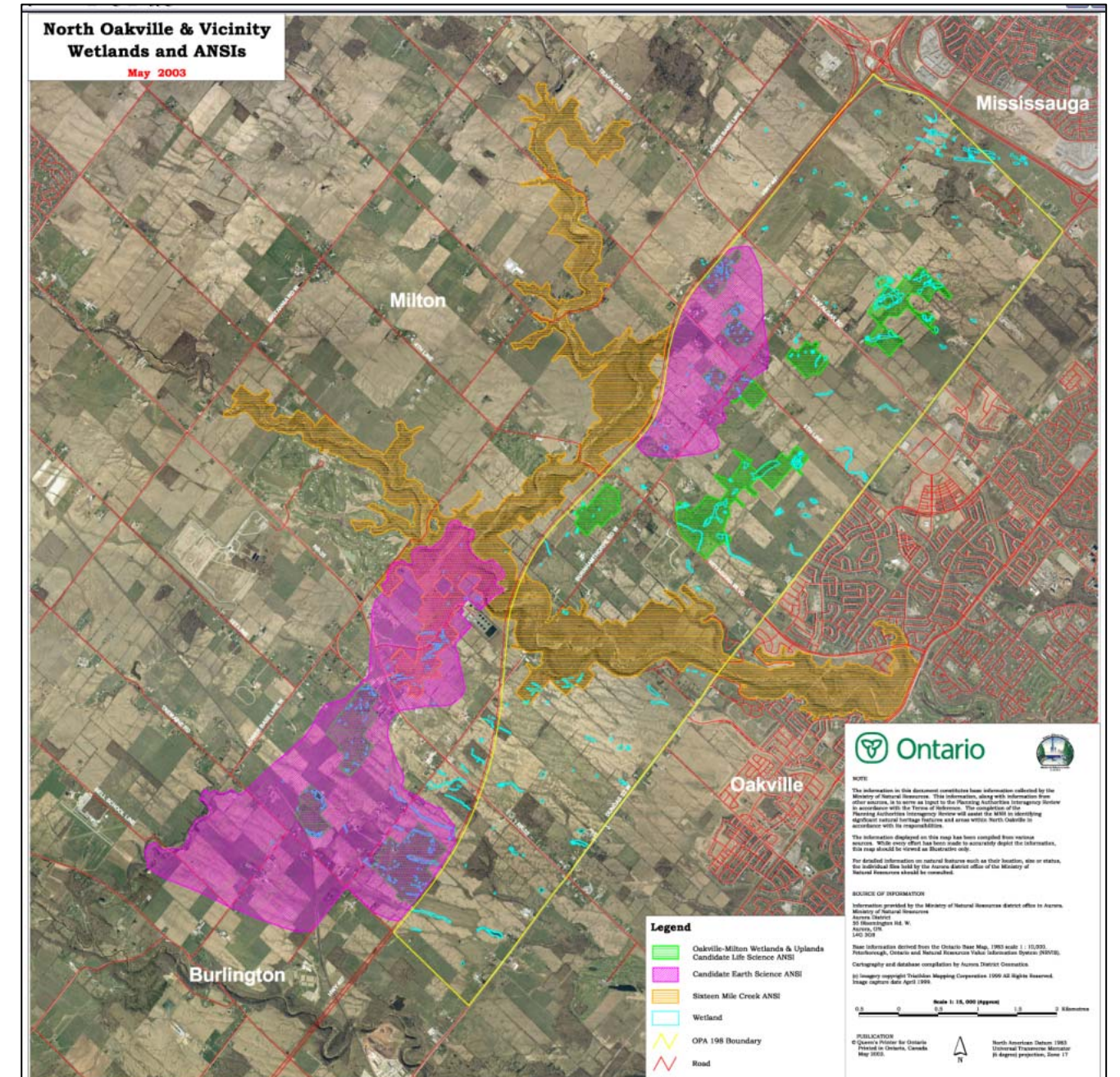
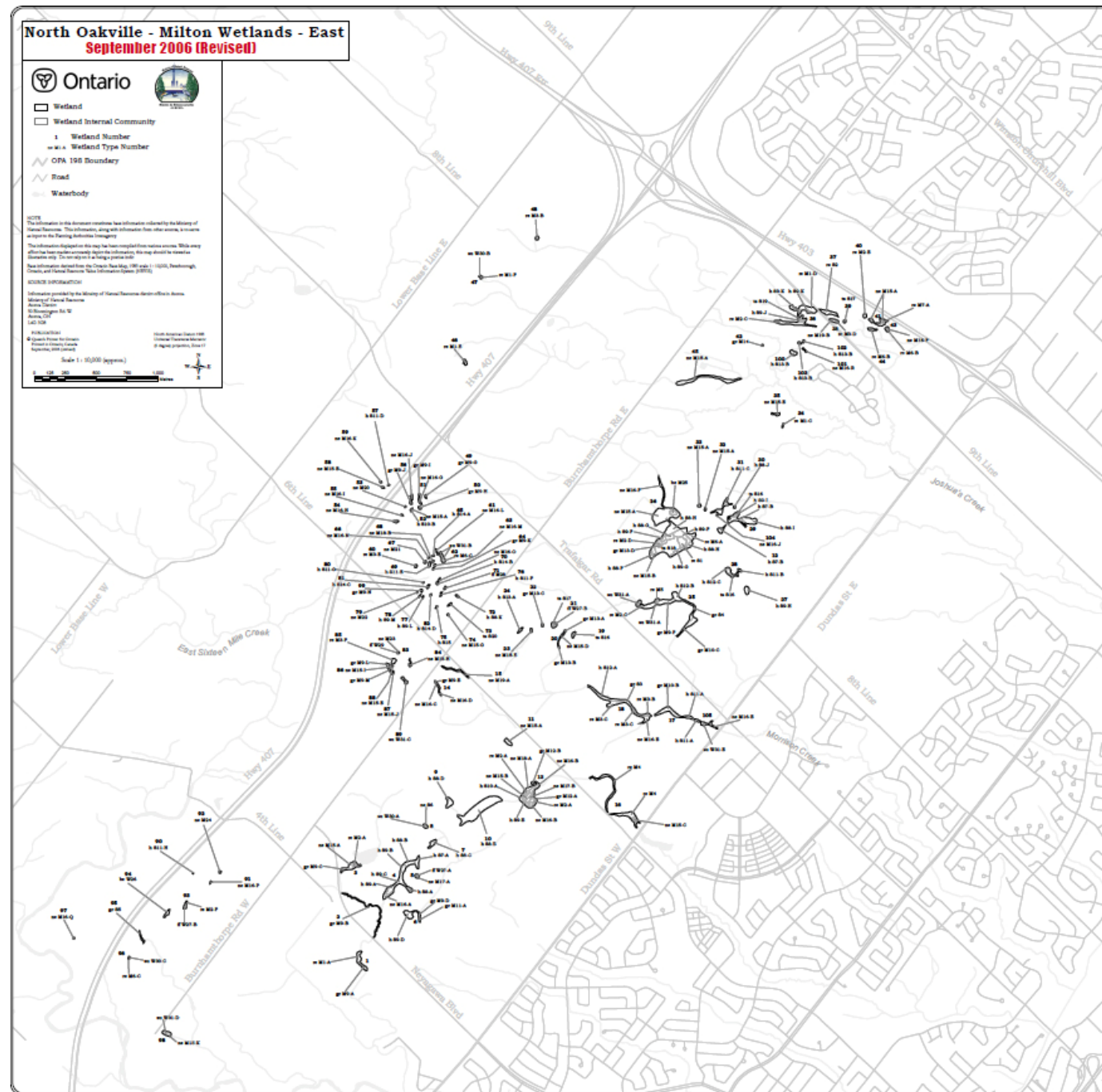


Exhibit 4-6: North Oakville – Milton Wetlands



4.3 SIGNIFICANT SPECIES

The table below summarizes the rare species in the Study Area presented by organism type, including vascular plants, breeding birds, mammals, reptiles, Lepidoptera, Odonata and fish, and scale of significance, including national provincial, regional, and local. Data includes secondary source information presented in preceding sections and results of GLL surveys of the Sixteen Mile Creek valley and associated tablelands. Only the highest scale of significance is presented for each species (for example, Broad-leaved Puccoon [*Lithospermum latifolium*] is provincially rare, regionally rare and locally rare, however, it is only counted at the provincially level of significance).

	Scale of Significance											Total Species*	
	National		Provincial		Regional		Local		Area-Sensitive				
	SS	GLL	SS	GLL	SS	GLL	SS	GLL	SS	GLL	SS	GLL	
Flora	1	1	7	6	53	26	42	3	NA	NA	103	36	
Breeding Birds	4	0	0	0	7	0	NA	NA	21	10	28	0	
Mammals	1	0	3	0	7	0	0	0	NA	NA	11	0	
Reptiles	7	0	1	0	0	0	0	0	NA	NA	8	0	
Lepidoptera	1	1	1	0	0	0	0	0	NA	NA	2	1	
Odonata	NA	0	NA	0	NA	0	NA	0	NA	NA	NA	0	
Fish	1	NA	1	NA	2	NA	2	NA	NA	NA	6	NA	
Total Species	15	2	14	6	68	26	61	3	11	10	158	37	

Notes: SS – Secondary Sources
 * - Area-sensitive birds not included in calculation of TOTAL Species

4.3.1 Surface Water

In 2002 and 2003 the Town of Oakville reviewed and updated previous hydrological analyses in North Oakville. The undertaking included continuous flow monitoring, cross-section and creek velocity measurements at Joshua’s Creek, Morrison Creek, Shannon’s Creek and Munn’s Creek. The monitoring results suggest all creeks were dry throughout June, July and August.

Based on North Oakville Creeks Subwatershed Study (NOCSS) findings, only East Morrison Creek and Fourteen Mile Creek had temperature issues/concerns associated with them. With respect to the proposed NNOTC realignment, East Morrison Creek is far enough away not to be detrimentally impacted. Monitoring of temperatures in Fourteen Mile Creek for approximately one year is recommended. Discharge to sub-surface rock filtration systems (i.e. trenches) should be implemented to provide maximum temperature benefits. Shading of runoff where possible is also recommended.

4.3.2 Soils

Physiographically, the Study Area is located within the geological domain known as the “South Slope”. The South Slope is the southern slope of the Oak Ridges Moraine including a strip south of the Peel Plain, and is predominantly a moraine till plain which, in the Study Area, is known as the Trafalgar Moraine. The moraine till plain was formed following the retreat of the Wisconsin ice sheet which covered the area during the Pleistocene Epoch. After deglaciation and during the draining of the glacial lakes north of the Trafalgar Moraine, several deep river valleys were formed by erosion of the overburden and bedrock.

The overburden in the Study Area consists generally of unsorted, unstratified heterogeneous mixtures of clayey silts, sands and gravels of glacial till origin. The till is generally classified as a clayey silt of low plasticity and forms the

matrix for the sands and gravels which are variable in proportion. The overburden varies in thickness but is typically less than a few metres except within the creek valleys; the major one within the Study Area being the Sixteen Mile Creek.

The creek valley is relatively wide and the valley slopes are typically 30 m to 40 m in height in the Study Area. Based on the available borehole information from the design/construction of the bridges at Highway 407 and Dundas Street, it is expected that there would be typically less than 4 m or so of overburden within the floodplain area at the base of the valley itself but that there could be between 6 m and 12 m of the till deposits at the crest of the valley slopes. The overburden is underlain by shale bedrock of the Queenston Formation which consists of red-brown shale containing limestone/siltstone interbeds. In some areas of the Sixteen Mile Creek valley, it is known that there are infilled bedrock valleys where there can also be relatively poor quality bedrock.

4.3.3 Topographic Depressions and Wet Features

The North Oakville Creeks Subwatershed Study identifies numerous topographic depressions as shown on **Exhibit 4-7**. It was determined that the primary function of these depressions was surface storage but that these features are generally less than 1.0m in depth. Some of these depressions are in areas that are currently used for other purposes (e.g. recreation, agriculture), and as a result have been significantly modified from their original form and function. A limited number of these features are part of a drainage network, but many are not connected to the overall drainage network unless overflow occurs as a result of significant rainfall exceeding the storage volume of a given depression.

Alignment of the proposed New North Oakville Transportation Corridor will be designed to minimize impacts on existing topographical depressions and wet features. However, where the alignment cannot be designed to completely avoid existing topographic depressions that provide natural storage, proposed SWM facilities intended to service the proposed NNOTC and adjacent development should be designed to compensate for the loss in natural storage volume. It is recommended based on the findings of the NOCSS that the permanent pool storage volume(s) of the affected facilities be increased in size to provide the necessary compensatory storage under ultimate conditions as part of the detail design process.

4.3.4 Geomorphology

Defined Features

The geomorphic survey and assessment for the NNOTC alignment followed a risk-based approach on a site-specific basis to determine the appropriate crossing structure size from a geomorphic perspective. For defined channels (i.e., defined bed and banks), the risk assessment process considered parameters such as channel size (i.e., a scalar approach), valley setting, meander belt width, meander amplitude and channel stability (i.e., rapid assessment results from the NOCSS). For defined channels that display a sinuous, meander geometry, the governing meander amplitude in the immediate vicinity of the crossing would represent the minimum span from a geomorphic perspective to avoid in-stream works. While this amplitude may also coincide with the meander belt width, this is often not the case as a crossing is located along a sinuous section of channel where the relevant amplitudes do not represent those driving the belt width dimension. Within the Study Area, however, the few defined channels that were identified for geomorphic input have been heavily modified as a result of historical land practices. As such, the minimum span should be based on three times the average bankfull channel width (as identified through the NOCSS). This span is deemed sufficient to support the geomorphic form and function of the channel while minimizing future maintenance requirements.

Undefined Features (Bankfull channel could not be discerned)

For the majority of the crossing locations along the proposed NNOTC alignment, rapid assessment results from the NOCSS indicated that the features were poorly defined, with little to no flow observed at the time of survey. Given that the drainage features themselves did not display defined bed or banks, the geomorphic design parameters identified above did not apply. Moreover, these features tended to have been highly modified through historic land use practices. Consequently, providing a recommended structure size for these sites from a geomorphic perspective was deemed inappropriate. As such, the minimum required span for these sites was deferred to dimensions identified through integration of the remaining team disciplines.

Bank Stability

Based on the rapid assessment results presented in the NOCSS, all of the drainage features identified for geomorphic input were deemed to be stable or 'in regime'. Consequently, bank erosion is not deemed to be a concern at any of the culvert sites. Moreover, the majority of these features were deemed to be undefined and, as such, lacked a discernable bank. Those features that were identified as defined channels lacked a confined valley system and were not identified as an area of concern with respect to erosion on a reach basis. Channel stability classifications established as part of the NOCSS are shown on **Exhibit 4-8** and **Exhibit 4-9**.

Exhibit 4-7: Topographic Depressions and Wet Features

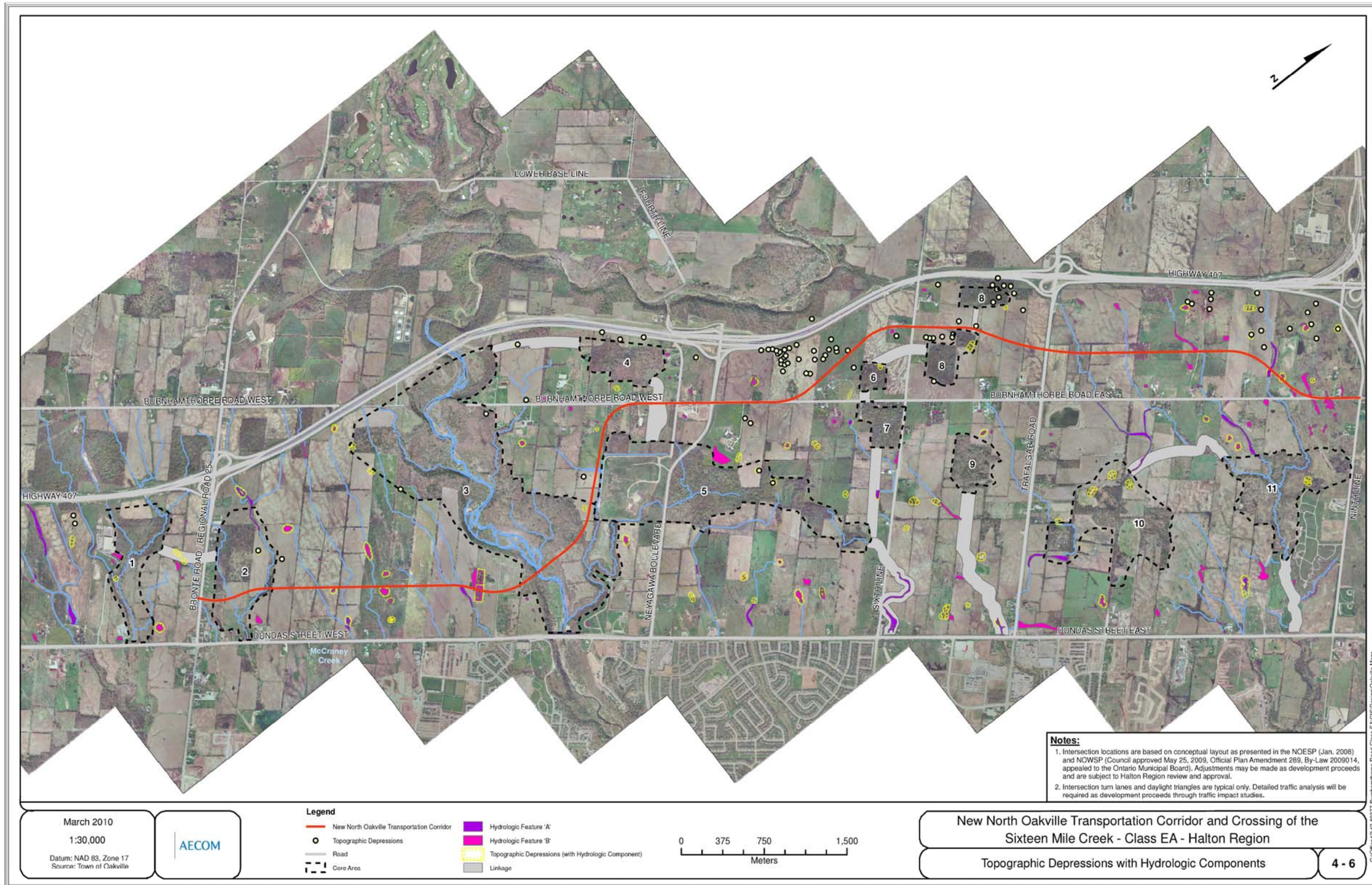


Exhibit 4-8: Channel Stability - West Study Area

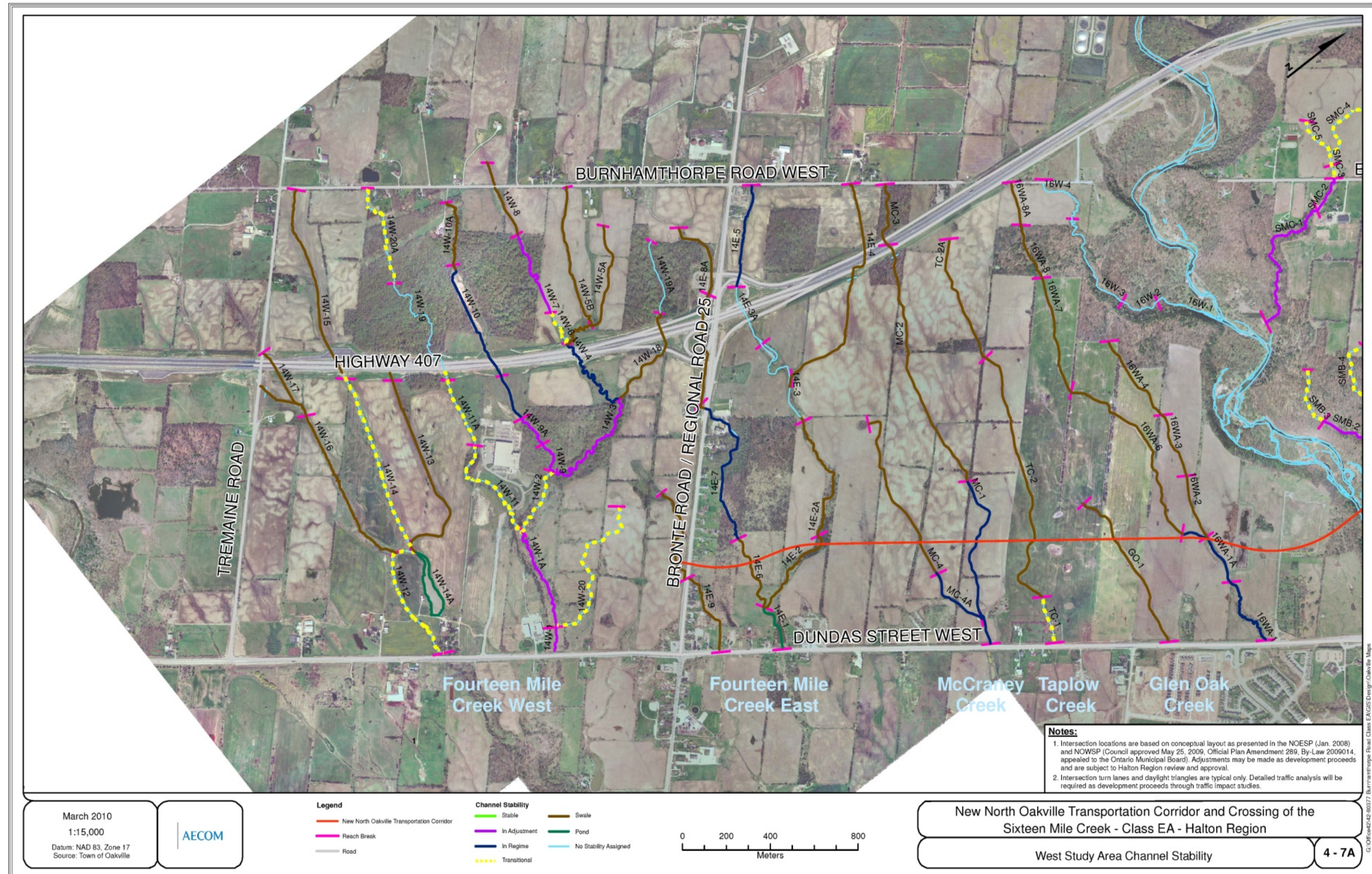
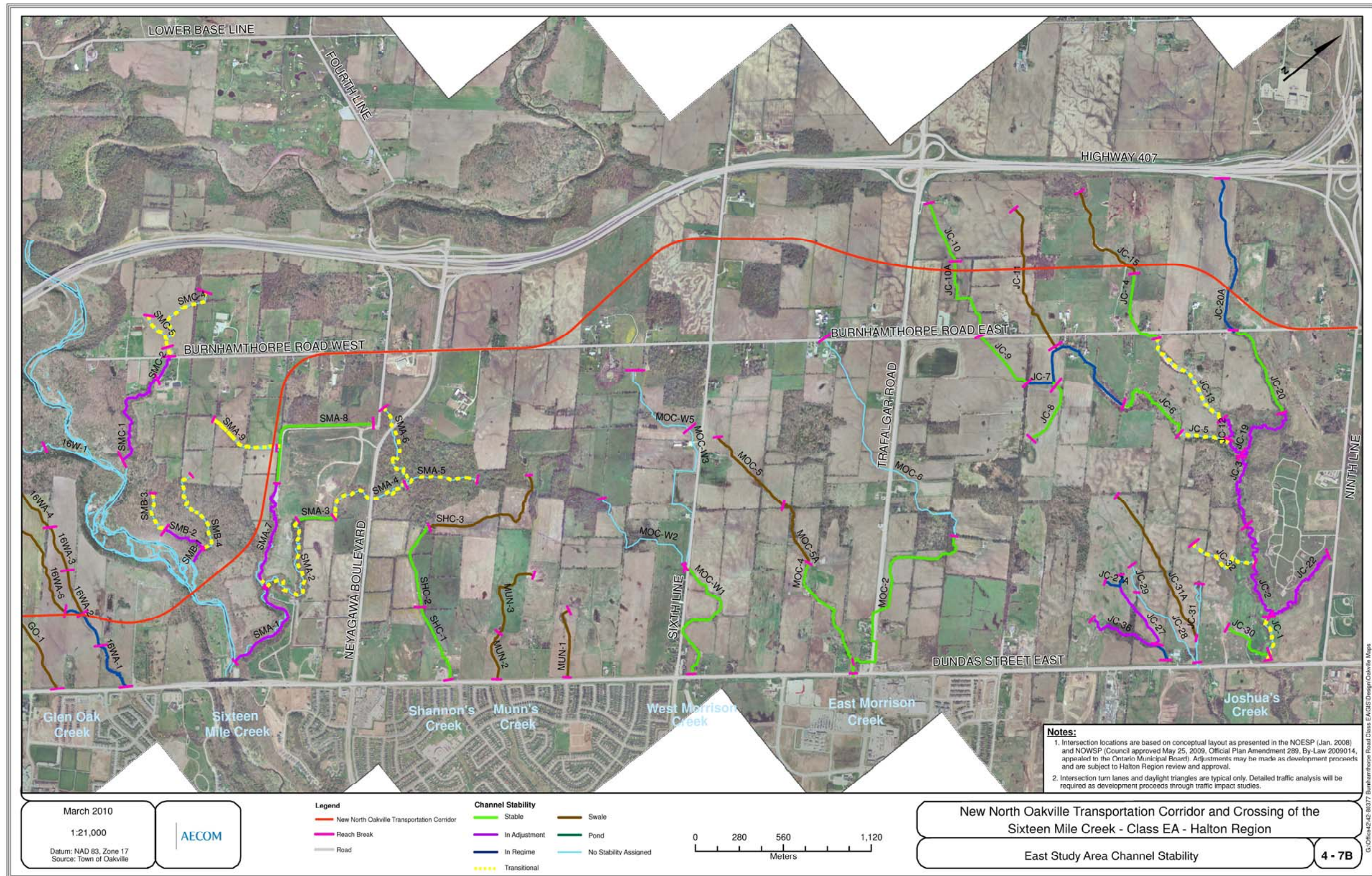


Exhibit 4-9: Channel Stability - East Study Area



4.4 SOCIAL ENVIRONMENT

4.4.1 Existing Land Use

Existing categories of land use in the Study Area include agriculture, residential, recreational/open space, commercial, utility/service and community/institutional uses. The majority of the lands are currently used for agriculture, including fieldcrops and some livestock operations (horses and limited cattle). Most notable among the agricultural uses are the equestrian ranches located along Burnhamthorpe Road, some of which include a service component (e.g. training, lessons and/or trail rides). In addition, there are numerous small livestock and cash crop farm operations located throughout the Study Area.

Residential uses in the Study Area include scattered farm dwellings and clusters of rural non-farm dwellings (single detached), with the largest housing concentration located in the Palermo hamlet area along Bronte Road and Dundas Street. In total there are approximately 140 dwellings located in the Study Area, at least 60 of which front on Burnhamthorpe Road.

Community/institutional uses in the area include community centres, schools, places of worship and cemeteries. Specifically, there are three cultural/community facilities, including the Hindu Temple located on the east side of Bronte Road, the Islamic Circle of North America facility located on the north-west side of Burnhamthorpe Road east of Trafalgar Road, and Kingdom Hall located on the west side of Ninth Line. There are also two schools in the area, King's Christian Collegiate located at the southwest corner of Burnhamthorpe Road and Neyagawa Boulevard, and Fern Hill School located on the west side of Ninth Line. In addition, there are places of worship located on Dundas Street, Sixth Line, Trafalgar Road and Ninth Line, and two large cemeteries (Glen Oaks Memorial Gardens and Trafalgar Lawn).

There are also several examples of recreational/open space land uses in the Study Area, including golf courses, driving ranges, parks and trails. There are more than 125 hectares of municipal parkland (including valleylands and undeveloped parkland), which are used for two parks including North Park and Lions Valley Park, both located near Dundas Street and Neyagawa Boulevard. Facilities at North Park were limited to a leash-free dog area, however, a future sports park development is approved for this location. Lions Valley Park provides parking and access to the trail system along Sixteen Mile Creek. Private recreational open space uses include a golf course and driving ranges.

Utility/service uses in the Study Area include the water treatment plant, hydro transmission corridor and transformer station located north of Bronte Road and west of Highway 407, a closed landfill site located on the west side of Neyagawa Boulevard to the south-west of Burnhamthorpe Road, the municipal water tower located to the south-west of Trafalgar Road and Burnhamthorpe Road, as well as several communications towers. Also, an EA has recently been completed for a future North Operations Yard for Oakville.

There are limited examples of commercial land uses in the Study Area: scattered restaurants, gas stations/auto service centres and rural commercial uses such as building supply yards, topsoil and firewood sales. No industrial uses exist in the Study Area, with the possible exception of light manufacturing activities that may be associated with some farm operations.

In addition to the above land use activities, the Study Area's rural landscape is characterized by many natural features, including numerous woodlots of varying size, scattered treelines and hedgerows, as well as many creeks and valleylands. The most dominant natural feature is the valley of Sixteen Mile Creek, which flows from west to east across the southerly portion of the Study Area. These features are described in greater detail in **Section 4.2** of this report.

To the northeast of the Study Area, there are numerous arterial commercial and industrial uses located beyond Highway 403 in the City of Mississauga. To the southeast, the Study Area is bound by new residential subdivisions and two commercial/retail centres located along the south side of Dundas Street. Adjacent to the extreme southwest corner, rural/agricultural and open space uses exist adjacent to the village of Palermo. Along the southwest boundary, lands formerly used for agriculture, rural residential and utility/service uses have been redeveloped as a new subdivision.

The area immediately to the west of Highway 407 is dominated by large wooded areas along the Sixteen Mile Creek corridor. There is a golf course located at the intersection of Lower Base Line and 4th Line, and another located at the northeast corner of Bronte Road and Lower Base Line. A wide hydro corridor runs parallel to Highway 407 from Bronte Road to Ninth Line.

In general, lands to the south and east of the Study Area are developed for urban uses, while lands to the north and west are undeveloped rural/agricultural lands and natural open space.

4.4.2 Regional Municipality of Halton Official Plan Policies

Halton Region's Official Plan provides clear direction as to how physical development should take place in Halton Region to meet the current and future needs of its people. The Official Plan outlines a long term vision for the Region's physical form and community character. To pursue that vision, it sets forth goals and objectives, describes an urban structure for accommodating growth, states the policies to be followed, and outlines the means for implementing the policies.

4.4.3 Livable Oakville

The Town of Oakville's Official Plan is referred to as "the Livable Oakville Plan". The Livable Oakville Plan:

1. establishes the desired land use pattern for lands within the Town, south of Dundas Street and north of Highway 407, to 2031;
2. coordinates land use and infrastructure requirements to ensure that the anticipated growth can be accommodated;
3. establishes a framework and policy context for decision making that provides certainty for the planning process; and,
4. conforms or does not conflict with provincial plans, has regard to matters of provincial interest, and is consistent with provincial policy statements.

The mission of the plan is to enhance the Town's natural, cultural, social and economic environments by ensuring that environmental sustainability, cultural vibrancy, economic prosperity and social well-being are incorporated into growth and development decisions.

The North Oakville East and West Secondary Plans are not part of this Plan and provide a separate policy framework with a land use pattern and policies for the lands between Dundas Street and Highway 407.

4.4.4 North Oakville Secondary Plan

The North Oakville Secondary Plan is comprised of two documents:

- North Oakville East Secondary Plan (NOESP) – The Planning Area is comprised of the Glenorchy and Joshua’s Meadows residential communities / employment districts and approximately 53 hectares of the Sixteen Hollow residential community/employment district.
- North Oakville West Secondary Plan (NOWSP) - The Planning Area is comprised of the 407 West and Sixteen Hollow industrial districts / employment lands.

The NOESP was approved by the Ontario Municipal Board in January 2008. The NOWSP was Council approved May 25, 2009, Official Plan Amendment 289, By-law 2009014 and appealed to the Ontario Municipal Board.

The two Secondary Plans provide land use designations that establish the general pattern of development and an overall vision for the existing and future use of the North Oakville East and West Planning Areas, which includes a range of designations, permitted uses and densities, including:

North Oakville East Secondary Plan:

- ‘Dundas Urban Core Area’ along the North Side of Dundas Street is intended to allow the creation of a band of mixed use development at medium and high densities with a clustering of retail and service commercial development and/or high density buildings at the intersections with north/south streets;
- ‘Neyagawa Urban Core Area’ at the intersection of Neyagawa Boulevard and Burnhamthorpe Road, creation of a secondary core area at the intersection of Neyagawa and a new east-west Major Arterial/Transit Corridor. The intent of this Core Area is to permit the provision of convenience commercial, institutional and employment uses to serve adjacent neighbourhoods, as well as related residential development, where a mix of dense residential, commercial and civic uses are permitted;
- ‘Trafalgar Urban Core Area’ along Trafalgar Road is intended to provide for the creation of a major Node - a dense, mixed use development concentration that is pedestrian and transit oriented. This area will link to and complement the Uptown Core to the south of Dundas Street;
- ‘Transitional Areas’ serving as an interface and buffer between the more intensive concentration of industrial, office and service employment uses located in the Employment District designation, and adjacent residential uses;
- Employment Districts’ along the southerly side of Highway 407 permitting a full range of employment uses;
- ‘Natural Heritage System Areas’ where watercourses, valleylands, woodlots and other natural features/open space are to be preserved;
- ‘Neighbourhood Areas’ located throughout the Planning Area are intended to accommodate a range of medium density residential development including live/work units and limited commercial and civic uses focused at a central neighbourhood activity node to serve neighbourhood residents;
- ‘Cemetery Areas’ to recognize existing cemeteries in the Planning Area; and
- ‘Community Park Area’ intended to accommodate the highest intensity of recreational use and level of facility development.

North Oakville West Secondary Plan:

- ‘Natural Heritage System Area’ designation reflects the Natural Heritage component of the Natural Heritage and Open Space System, including the Glenorchy Conservation Area. The primary purpose of the Natural Heritage component of the System is to protect, preserve and, where appropriate, enhance the natural environment;
- ‘Palermo Village North Urban Core Area’ designation is designed to ultimately provide for the creation of a “Secondary Transit Node”, in conjunction with the Palermo Village Community Centre south of Dundas St. This Node will be a dense, mixed use development concentration that is pedestrian and transit oriented; and
- ‘Employment District’ designation is to protect for, and establish a range of development opportunities for employment generating industrial, office and service employment uses. It will also include a Health Oriented Mixed Use Node on the north side of Dundas St. at Third Line.

The Secondary Plans emphasize walkable neighbourhoods, accessible transit systems, transit-oriented development, recognition of the natural environment and connectivity between the east and west sides of Sixteen Mile Creek. The Secondary Plans targets a range of residential densities, low density (45-55%) with some designations permitting medium (20-25%) and high density (20-35%). In total, the residential designations of the Secondary Plans provide a population capacity estimated at 45,000 to 55,000 for the NOESP and 700 to 1,000 for the NOWSP, and the employment areas target the creation of as many as 25,000 jobs for the NOESP and 10,200 for the NOWSP.

The North Oakville Secondary Plans provide policies to address a number of issues, such as air and energy efficiency, streetscape design, the provision of community services and infrastructure, natural and cultural heritage preservation, and the review of development applications.

The Secondary Plans also identify, in greater detail, the environmental features and constraints to development in the Study Area (e.g. watercourses, flood-prone areas, woodlands, valleylands, etc.). Also of note, the Secondary Plan identifies conceptual road alignments to provide transportation service to the proposed land use designations; included among these is the alignment for the New North Oakville Transportation Corridor (the subject of this Class EA) shown as an extension of Burnhamthorpe Road crossing Sixteen Mile Creek north of Dundas Street. Existing Burnhamthorpe Road will be designated as a Character Road facility with the exception of the existing Burnhamthorpe Road corridor that will be utilized as part of the New North Oakville Transportation Corridor.

4.5 CULTURAL ENVIRONMENT

4.5.1 Archaeological Resources

In May 2005, Archeoworks Inc. conducted a Stage 1 archaeological assessment of the Study Area. The assessment results are summarized below with further details provided in the Archeoworks Inc. Archaeological Assessment Report provided in **Appendix E**.

Pre-survey Research

Pre-survey research encompasses all archaeological research that can be conducted without physical site testing. This research was undertaken to identify archaeological sites within the proposed development area and to assess the property’s archaeological potential.

Registered Archaeological Sites

In order to compile an inventory of archaeological resources for this Study Area, two sources of information were consulted: the site record forms for registered sites housed at the *Ministry of Tourism, Culture and Recreation (MTCR)* and published and unpublished documentary sources.

Physiographic Description

An investigation of the Study Area's physiography was conducted by reviewing *The Physiography of Southern Ontario (3rd Edition)*, a volume published by the *Ministry of Natural Resources*. This investigation was conducted to aid the researcher in developing an argument for archaeological potential based on the environmental conditions of each subject property. Environmental factors such as close proximity to water, soil type, and nature of the terrain, for example, can be used as predictors to determine where human occupation may have occurred in the past.

Review of Historical Land Use

To assess the Study Area's potential for the recovery of historic remains, several types of documents held at the *Archives of Ontario* were reviewed in order to gain an understanding of the land-use history (i.e.: names of individuals occupying which property, family details, personal information, etc.). These include early surveyors' maps, specifically the *Tremaine Map* series for the Counties in Ontario, as well as the *Illustrated Historical Atlases* for the Counties of Ontario.

Field Review

The final component of a Stage 1 investigation includes site visit information. The visual inspection is necessary to review the physiography of the land and the conditions of the Study Area (i.e. disturbed, low and wet, undulating). Each area of disturbance within the Study Area was photo-documented to help confirm the background research establishing the archaeological potential for the Study Area.

The review of Ministry of Culture site registry files found that a total of 36 sites have been registered within 300 metres or closer to the Study Area and a long cultural history of occupation ranging in date from early Aboriginal to late Euro-Canadian and in complexity from only an isolated artifact to a multifaceted village.

This high amount of archaeological activity within the Study Area can be attributed to the close proximity of water courses including McCraney Creek, Sixteen Mile Creek, Munn's Creek, Morrison Creek and Joshua's Creek. In terms of archaeological potential, potable water is arguably the single most important resource necessary for any extended human occupation or settlement. Since water sources have remained relatively stable in southern Ontario since post-glacial times, proximity to water can be regarded as a useful index for the evaluation of archaeological site potential. Indeed, distance from water has been one of the most commonly used variables for predictive modeling of site location.

The *Ministry of Culture's* primer on archaeology, land use planning and development in Ontario stipulates that undisturbed lands within 300 metres of a primary water source, and undisturbed lands within 200 metres of a secondary water source, are considered to be of high archaeological potential (1997: pp12-13). In this context, Sixteen Mile Creek, Morrison Creek and Joshua's Creek, following and bisecting the Study Area, represent significant potential for the location and recovery of additional prehistoric Aboriginal archaeological resources within the Study Area boundaries.

In addition, the Study Area has a long history of historical land use, both for rural settlement and agricultural purposes. Three historic villages: Palermo, Munn's Corners and Trafalgar, fall within the boundaries of the Study Area.

Based on the visual documentation of suitable topography, the close proximity of known archaeological sites, historical documentation and the close proximity of several watercourses, additional significant sub-surface prehistoric Aboriginal and 19th century Aboriginal and Euro-Canadian sites may be discovered at any undisturbed location within the Study Area.

Archaeological Assessment of the ORC Lands

In May 2006, a Stage 1-3 Archaeological Assessment of the Ontario Realty Corporation Property, Oakville Assembly Lands, Part of Lots 25, 26, 27, 28 and 29, Concession 1 NDS, Township of Trafalgar, Town of Oakville was undertaken on behalf of the Ontario Realty Corporation. The results of the Stage 1-3 assessment indicated that the Oakville Assembly Lands do not contain any significant archaeological resources. Accordingly, the report recommended that the archaeological conditions attached to this property be cleared to allow development.

4.5.2 Built and Cultural Heritage Resources

A review of primary and secondary sources and historical mapping reveals the nineteenth century Euro-Canadian settlement and agricultural development of the Study Area and its survival throughout the twentieth century. Numerous buildings and structures and cultural landscape features dating from the nineteenth century and of 40 years of age or older in the twentieth century have survived to the present day. Some of these features and landscapes are relatively unchanged and in original use, while others are unused or abandoned, or altered and adapted to a new use. Although rate of change in the Study Area increased somewhat during the last quarter of the twentieth century, the rural character has been maintained. In contrast, during this period the former Trafalgar Township, now part of the Town of Oakville, south of Dundas Street West, has evolved from a rural agricultural area to a residential subdivision. Highway 407 was built between 1999-2001, entering the Study Area north of Burnhamthorpe Road West in the west, travelling in a southwesterly direction to Regional Road 25.

Generally the rural nature of the Study Area is characterized by active farm complexes with associated agricultural fields, fencing, treelines, windbreaks and laneways as well as former farmhouses, rural residences and the 19th century historical settlements of Palermo, Munn's Corners and Trafalgar. Some traces remain of the 19th century hamlets of Glenorchy and Snider's Corners. Throughout most of the Study Area many farmsteads are set well back from the road with fences enclosing the fields adjacent to the road; others are placed close to the road right-of-way.

Two cemeteries are located within the Study Area, namely, the Glen Oaks Memorial Gardens at No. 3164 Ninth Line and the Trafalgar Lawn Cemetery at Highway 5 (Dundas Street) at Fourth Line. The Trafalgar Lawn Cemetery is over forty years old. Two early cemeteries are located south of Dundas Street adjacent to the Study Area boundary, namely, the Munn's Pioneer Cemetery in Munn's Corners, which is designated under Part IV of the *Ontario Heritage Act*; Knox Presbyterian Church and Cemetery located at No. 1150 Dundas Street West, which is designated under Part IV of the *Ontario Heritage Act*; and the Palermo Cemetery located at No. 2521 Dundas Street West.

Sixteen Mile Creek played an important part in the settlement of Trafalgar Township as a transportation route and as a power source for early saw and gristmills. The east to west concession roads and north to south sideroads form a grid pattern in the landscape. Regional Road 25 (Bronte Road), a paved four-lane arterial road, is located on the west side of the Study Area. Lower Base Line Road on the northern boundary in the western section of the Study Area is a narrow, winding, rural two-lane gravel road characterized by steep creek valleys, a water crossing and treelines. Highway 407 forms the northern boundary in the eastern section. Ninth Line is a two lane improved paved road on the eastern boundary of the Study Area. The Study Area is bounded by Dundas Street (Regional Road 5) to the south.

Several distinctive roadscapes are found within the Study Area. Fourth Line is a narrow, paved, rural road with no shoulders to the north and south of Highway 407. Sixth Line has open vistas on both sides of the road across agricultural land. Eighth Line consists of a section of open road at Dundas Street West and a right-of-way with

associated treelines and fencerows at Burnhamthorpe Road. Burnhamthorpe Road is a narrow, undulating paved road with two lanes lined with treelines, fencerows, hedgerows and generally grassy ditches with narrow gravel shoulders. Dundas Street, which formed the base line for the survey of the Trafalgar Township and was opened in the late 1790s as a military road and early settlement route in Upper Canada, is a major four lane arterial road running along the southern boundary.

The cultural heritage resources identified within the Study Area are considered to be of varying degrees of heritage value, interest and merit. These attributes do not necessarily mean that all heritage resources must be preserved, but careful consideration should be given in regard to their management and conservation during the process of planning change. Numerous properties within the Study Area have been listed or designated by the Town of Oakville. The Cultural Heritage Assessment Report (May 2007) prepared by Unterman McPhail is provided in **Appendix F** with a complete list of cultural heritage resources identified within the Study Area.

5 ALTERNATIVE SOLUTIONS

Alternative solutions represent transportation planning options for addressing the identified transportation problems and opportunities. The problem and opportunity statement has identified the need for transportation system capacity improvements in an east-west direction from Bronte Road to Ninth Line, including crossing the Sixteen Mile Creek.

Alternative solutions typically include improvements to existing roads or building new roads; improving transit; transportation systems management (optimizing transportation performance); and transportation demand management (reducing travel demand).

Alternative solutions were assessed on the basis of a comprehensive set of factors and criteria that reflected the following considerations:

- Provincial and federal government legislation, policies and guidelines;
- Municipal policy (Region of Halton, and Town of Oakville);
- Existing and future natural, social, economic, cultural and engineering conditions within the Study Area;
- Issues and concerns identified during consultation with ministries, agencies, municipalities, ratepayer and interest groups and the general public; and
- Project Team investigations and expertise.

A two step process was used for the assessment of alternative solutions. First, a long list of alternatives was assessed/screened based on the effectiveness of each to address the identified problem/opportunity using only one factor, transportation. The alternative solutions that had potential to address the identified problem/opportunity were carried forward to a short list of alternatives and were assessed against a broader range of factors and criteria. This is explained further in **Sections 5.1 and 5.2**.

The assessment used a methodology called the “reasoned argument assessment” that is well established and endorsed by regulatory agencies and practitioners of the Environmental Assessment process. It features:

- An examination of the relative significance of impacts by factor and criteria;
- An assessment of the differences in net impacts associated with the alternative solutions. The differences define the advantages and disadvantages of each alternative solution; and
- A presentation of key trade-offs between the various assessment factors and criteria and the reasons why one alternative is preferred over the others.

5.1 LONG LIST OF ALTERNATIVE SOLUTIONS

The following “long list” of alternative solutions was identified as having potential to address the problems and opportunities within the Study Area. Road system expansion alternatives include those east-west transportation corridors that have both reasonable proximity to the Study Area and potential to address problems/opportunities. The degree of widening for each alternative is defined on the basis of the number of additional lanes that could reasonably be added to existing corridors and the capacity required to adequately accommodate future east-west travel demand through the Study Area.

Do Nothing

- Included as a benchmark for the assessment of the other alternatives
- Involves no physical and/or operational modifications to transportation infrastructure in the Study Area

Transportation System Improvements (non-expansion)

- Transportation Demand Management (TDM) - reduce auto usage (e.g. car pooling, land use planning)

- Transportation Systems Management (TSM) - maximize existing road capacities for all modes (e.g. signal optimization, transit signal priority, intersection improvements, transit queue jump lanes)
- Transit Service Enhancements (e.g. service increases that do not trigger major road expansion such as increased frequency of service and new routes)

Provide Transit Supportive/Dedicated Infrastructure

- Reserved Bus Lanes, Light Rail Transit

Road System Expansion (Bronte Road to Ninth Line)

- Widen Highway 407 – the 407 corridor has provision to expand the freeway up to 10 lanes
- Widen Dundas Street to 10 lanes
- Widen Lower Baseline to 4 lanes
- Widen Burnhamthorpe Corridor to 4 lanes (existing or new alignment)

5.2 SCREENING THE LONG LIST OF ALTERNATIVE SOLUTIONS

The following transportation criteria were identified through consultation with Project Team members, Technical Agencies Committee members and the Stakeholder Group. These criteria were used to “screen-out” unsuitable alternative solutions based on the identified transportation problems/opportunities for this EA so that a short list of alternative solutions could be identified and carried forward for a more detailed evaluation/assessment. The purpose of this step is to ensure that only the alternative solutions that adequately address the transportation identified problems/opportunities are carried through to the detailed assessment.

The following is a list of the transportation criteria used in the screening:

- **Accommodation of future travel demand** - year 2021 travel forecasts based on approved population and employment targets.
- **Traffic operations** – considers traffic flow, accessibility to properties and infiltration to local roads.
- **Travel safety** - considers all modes of travel including motorized, cycle and pedestrian.
- **Emergency services** - response time and accessibility to planned development.
- **Road network compatibility** - provides for continuity and connectivity of the road system in accordance with Halton Region’s Transportation Master Plan.
- **Transit network connectivity** - provides for and connects to planned transit system.
- **Commercial goods movement** - provides for truck traffic through and to planned employment areas.
- **Accommodation of pedestrian/cyclists** - provides effective and safe amenities and limits barriers to travel.

Exhibit 5-1 details the screening of the long list of alternative solutions.

On the basis of the screening results, three alternative solutions were carried forward for a more detailed assessment including widening Dundas Street, widening the Burnhamthorpe corridor and “Do Nothing”. Although the “Do Nothing” alternative solution does not address the identified transportation problems/needs, it is carried forward for further assessment as a benchmark for comparison.

Exhibit 5-1: Screening the Long List of Alternative Solutions

	DO NOTHING	ROAD SYSTEM EXPANSION (Bronte Road to Ninth Line)				TRANSPORTATION SYSTEM IMPROVEMENTS (NON-EXPANSION)			
		Upgrade Capacity of Adjacent Roads			Burnhamthorpe Corridor Widening (4 Lanes) Existing or New Alignment	Transit Supportive/ Dedicated Infrastructure	Transportation Demand Management (TDM)	Transportation Systems Management (TSM)	Transit Services Enhancement
		Highway 407 Improvements (addition of one lane in each direction)	Dundas Street Widening (10 Lanes)	Lower Baseline Widening (4 Lanes)					
Accommodation of Future Travel Demand	<ul style="list-style-type: none"> Regional and local roadways in the Study Area cannot accommodate current or future travel demands at an acceptable level of service. 	<ul style="list-style-type: none"> Highway 407 designed to accommodate longer distance trips. Tolls an impediment to attracting local travel demand. Regional and local roadways in the Study Area cannot accommodate current or future local travel demands at an acceptable level of service. 	<ul style="list-style-type: none"> Widening to 10 lanes would be required if transit ridership through the Study Area remains at the current ridership levels in the Town of Oakville (approximately 7-8%). Provides required capacity to accommodate forecasted travel demand through Study Area. 	<ul style="list-style-type: none"> Does not on its own provide required capacity to accommodate travel demand within the Study Area as it is too far removed from planned population and employment to be effective. 	<ul style="list-style-type: none"> Provides required capacity to accommodate forecasted travel demand through the Study Area. 	<ul style="list-style-type: none"> Requires new infrastructure to support east-west bus rapid transit or light rail transit (e.g. widening Dundas Street to 8 lanes). Requires extensive transit system/network improvements to support higher order east-west service. Without a significant travel behavioural change, does not address forecasted transportation deficiencies. 	<ul style="list-style-type: none"> Does not reduce demand to the extent required to address forecasted deficiencies within Study Area. TDM is an important component of the Region's Transportation Master Plan required to reduce auto dependency and maximize effectiveness of the transportation infrastructure. 	<ul style="list-style-type: none"> Does not provide required capacity to accommodate travel demand within the Study Area. It is, however, a necessary component of the Region's Transportation Master Plan (TMP) to maximize effectiveness of the transportation infrastructure. 	<ul style="list-style-type: none"> Does not reduce demand to the extent required to address forecasted deficiencies within the Study Area. Increased congestion on regional and local roadways is an impediment to the effectiveness of transit improvements.
Traffic Operations	<ul style="list-style-type: none"> Recurring congestion and delay will increase over time. Accessibility to properties will degrade. Traffic infiltration on local roads will increase. 	<ul style="list-style-type: none"> Recurring congestion and delay will increase over time on local roadways. Accessibility to properties will degrade. Traffic infiltration on local roads will increase over time. 	<ul style="list-style-type: none"> Restrictions to local access will be required. Limited dedicated turn lanes and turn restrictions required at crossing roads. Grade separations at major intersections may be necessary. 	<ul style="list-style-type: none"> Lower Baseline would operate effectively but other roads would operate under recurring congestion and delay. Traffic infiltration on local roads will increase. 	<ul style="list-style-type: none"> A grid of 4 and 6 lane arterial roads provides improved traffic operations over an 8 to 10 lane corridor – allows for access, provides for turning movements and removes requirements for grade separations. 	<ul style="list-style-type: none"> Without a significant travel behavioural change: <ul style="list-style-type: none"> recurring congestion and delay will occur; accessibility to properties will degrade; and traffic infiltration on local roads will increase. 	<ul style="list-style-type: none"> Recurring congestion and delay will occur. Accessibility to properties will degrade Traffic infiltration on local roads will increase 		
Travel Safety	<ul style="list-style-type: none"> Traffic congestion will increase in the Study Area over time. Potential for collisions will increase over time due to degraded operations, especially at intersections. 	<ul style="list-style-type: none"> Potential for collisions on local and regional roadways will increase over time due to degraded operations, especially at intersections. 	<ul style="list-style-type: none"> A widened Dundas Street will be less safe during off-peak hours due to increased travel speed. In addition, stop-controlled accesses to a 10 lane road may be less safe than that of a 6 lane road. 	<ul style="list-style-type: none"> Does not improve travel safety within the Study Area. Improving the road surface may lead to speed increase and associated increase in safety risk. 	<ul style="list-style-type: none"> Reduced traffic congestion in the Study Area will result in improved travel safety. 	<ul style="list-style-type: none"> Transit improvements will reduce vehicle usage, and accordingly, the reduced exposure to risk will improve road safety. 	<ul style="list-style-type: none"> TDM measures will reduce vehicle usage, and accordingly, the reduced exposure to risk will improve road safety. 	<ul style="list-style-type: none"> Minor short-term improvements to traffic operations within the Study Area may reduce potential for collisions. 	<ul style="list-style-type: none"> Transit improvements without adequate road improvements may result in higher road safety risk.

Exhibit 5-1: Screening the Long List of Alternative Solutions

	DO NOTHING	ROAD SYSTEM EXPANSION (Bronte Road to Ninth Line)					TRANSPORTATION SYSTEM IMPROVEMENTS (NON-EXPANSION)		
		Upgrade Capacity of Adjacent Roads			Burnhamthorpe Corridor Widening (4 Lanes) Existing or New Alignment	Transit Supportive/ Dedicated Infrastructure	Transportation Demand Management (TDM)	Transportation Systems Management (TSM)	Transit Services Enhancement
		Highway 407 Improvements (addition of one lane in each direction)	Dundas Street Widening (10 Lanes)	Lower Baseline Widening (4 Lanes)					
Emergency Services	<ul style="list-style-type: none"> As regional and local roadway congestion increases in the Study Area, emergency response times will increase. 	<ul style="list-style-type: none"> Improvement in response times to areas in close proximity to Highway 407 interchanges. 	<ul style="list-style-type: none"> Improvement in response times to areas along Dundas Street. 	<ul style="list-style-type: none"> Does not improve emergency response times in Study Area as it is too far removed from planned population and employment to be effective. 	<ul style="list-style-type: none"> Improves emergency response times in the Study Area by providing an alternate east-west route. 	<ul style="list-style-type: none"> With increased infrastructure to serve increased transit levels, response times will improve. 	<ul style="list-style-type: none"> Potential for improvements in response times depends on success of demand management programs in reducing automobile use. 	<ul style="list-style-type: none"> Minor short-term improvement to response times possible with improvements to intersections, etc. 	<ul style="list-style-type: none"> Minor short-term improvement to response times possible with reduced auto usage.
Road Network Compatibility (with the Transportation Master Plan)	<ul style="list-style-type: none"> Inconsistent with the proposed system and function of roads recommended in the TMP. 	<ul style="list-style-type: none"> Inconsistent with the proposed system and function of roads recommended in the TMP. 	<ul style="list-style-type: none"> A widening beyond 8 lanes (including 2 lanes for HOV) is inconsistent with the function and character of Dundas Street as recommended in the TMP. 	<ul style="list-style-type: none"> Lower Baseline improvements are inconsistent with the system and function of roadways recommended by the TMP. 	<ul style="list-style-type: none"> Consistent with the system and function of roadways recommended by the TMP. 	<ul style="list-style-type: none"> Consistent with the objectives of the TMP. Inconsistent with the system and function of roads recommended by the TMP. 	<ul style="list-style-type: none"> Consistent with the objectives of the TMP. Recommended in conjunction with the system and function of roads in the TMP. 	<ul style="list-style-type: none"> Consistent with the objectives of the TMP. Recommended in conjunction with the system and function of roads in the TMP. 	<ul style="list-style-type: none"> Consistent with the objectives of the TMP. Recommended in conjunction with the system and function of roads in the TMP.
Transit Network Connectivity	<ul style="list-style-type: none"> A network of transit routes is required to effectively serve approved development in the Study Area. 	<ul style="list-style-type: none"> A Highway 407 transitway is planned for inter-regional service. A network of local transit routes is required to serve North Oakville and link to the Highway 407 transitway. 	<ul style="list-style-type: none"> A network of transit routes is required to serve approved development in the Study Area. 	<ul style="list-style-type: none"> Does not address transit network connectivity as it is too far removed from approved development in the Study Area. 	<ul style="list-style-type: none"> The transit network will be improved by an east-west connection along the Burnhamthorpe Corridor. A new alignment could provide improved connectivity to the approved development area west of Regional Road 25. 	<ul style="list-style-type: none"> Improved transit supportive infrastructure can address transit network connectivity if appropriately located to serve approved development in the Study Area. 	<ul style="list-style-type: none"> Reduction in automobile use will allow the existing transit network to operate more efficiently in the short term. 	<ul style="list-style-type: none"> TSM improvements provide minor contribution to transit network effectiveness in short term. 	<ul style="list-style-type: none"> Improved transit services without additional infrastructure will not address transit network connectivity.
Commercial Goods Movement	<ul style="list-style-type: none"> Commercial goods movement in the Study Area will degrade over time with increased congestion and delay. 	<ul style="list-style-type: none"> Trucks deterred from Highway 407 due to tolls. Does not serve commercial goods movement within the Study Area. 	<ul style="list-style-type: none"> Provides effective east-west connection within Study Area. Provides direct connection to Highway 403 and Highway 407. 	<ul style="list-style-type: none"> Does not serve commercial goods movement requirements as it is too far removed from the Study Area. 	<ul style="list-style-type: none"> Somewhat effective at serving long distance commercial goods movement through the Study Area. Serves as a local connection between approved developments in Study Area. 	<ul style="list-style-type: none"> Commercial goods movement in the Study Area will degrade over time with increased congestion and delay. 			

Exhibit 5-1: Screening the Long List of Alternative Solutions

	DO NOTHING	ROAD SYSTEM EXPANSION (Bronte Road to Ninth Line)				TRANSPORTATION SYSTEM IMPROVEMENTS (NON-EXPANSION)			
		Upgrade Capacity of Adjacent Roads			Burnhamthorpe Corridor Widening (4 Lanes) Existing or New Alignment	Transit Supportive/ Dedicated Infrastructure	Transportation Demand Management (TDM)	Transportation Systems Management (TSM)	Transit Services Enhancement
		Highway 407 Improvements (addition of one lane in each direction)	Dundas Street Widening (10 Lanes)	Lower Baseline Widening (4 Lanes)					
Accommodation of Pedestrian/ Cyclists	<ul style="list-style-type: none"> Existing east-west and other Study Area roadways do not exclusively accommodate pedestrians and cyclists. Provision for cyclists and pedestrians within existing corridors may be limited by right-of-way. 	<ul style="list-style-type: none"> Freeway does not provide for pedestrians and cyclists. Land use planning and urban design for North Oakville places greater emphasis on walking, cycling and transit to make a more liveable community. Highway 407 as an east-west corridor does not address those goals. 	<ul style="list-style-type: none"> Difficult to safely accommodate efficient pedestrian and cyclist crossing of a 10 lane road. A 10 lane road is less appropriate for on-road cycling. Pedestrian and cyclist opportunities would need to be well-separated from the roadway (more costly and requires additional right-of-way). A 10 lane road presents a significant barrier between communities and to crossing pedestrians and cyclist traffic. 	<ul style="list-style-type: none"> May be an opportunity to accommodate pedestrians and cyclists along upgraded Lower Base Line; however pedestrian and cycling opportunities for existing and future residents of North Oakville are not provided under this option. 	<ul style="list-style-type: none"> Opportunity to accommodate pedestrians and cyclists (sidewalks, bike lanes, on-road routes, etc.) along an upgraded Burnhamthorpe Corridor. 	<ul style="list-style-type: none"> Does not directly impact pedestrian and cycling opportunities; however, these modes are generally encouraged by increased transit since access to a wider area may be achieved without reliance on private automobiles. 	<ul style="list-style-type: none"> Pedestrian and cycling opportunities are generally encouraged as alternative modes under a TDM Strategy. 	<ul style="list-style-type: none"> Does not directly impact pedestrian and cycling opportunities. 	<ul style="list-style-type: none"> Does not directly impact pedestrian and cycling opportunities; however, these modes are generally encouraged by increased transit since access to a wider area may be achieved without reliance on private automobiles.
Summary	<ul style="list-style-type: none"> Does not address identified transportation problems/needs. 	<ul style="list-style-type: none"> Does not address identified transportation problems/needs in the Study Area. 	<ul style="list-style-type: none"> Addresses future travel demands across Study Area. 	<ul style="list-style-type: none"> Does not effectively address future travel demand as it is outside of North Oakville urban area. 	<ul style="list-style-type: none"> Most effectively addresses identified transportation problem/needs in the Study Area. 	<ul style="list-style-type: none"> On its own, does not fully address future transportation problems/needs in the Study Area. Required as part of an overall solution to reduce growth in auto demand. 	<ul style="list-style-type: none"> Each of these options, either on their own or collectively cannot address future transportation problems/needs. All are required as part of an overall solution to reduce growth in auto demand. 		
Recommendation	<ul style="list-style-type: none"> <i>Carry forward only as a benchmark for comparison.</i> 	<ul style="list-style-type: none"> <i>Do not carry forward for further analysis</i> 	<ul style="list-style-type: none"> <i>Carry forward for more detailed assessment.</i> 	<ul style="list-style-type: none"> <i>Do not carry forward for further analysis.</i> 	<ul style="list-style-type: none"> <i>Carry forward for more detailed assessment.</i> 	<ul style="list-style-type: none"> <i>Carry forward as a recommended component of overall transportation strategy.</i> 	<ul style="list-style-type: none"> <i>Carry forward as a recommended component of overall transportation strategy.</i> 		

5.3 ASSESSMENT OF THE SHORT LIST OF ALTERNATIVE SOLUTIONS

The three alternative solutions carried forward were assessed against the following detailed criteria (developed in consultation with public and agency stakeholders) to identify the recommended alternative solution:

Engineering

- Construction impacts
- Utility/service relocations
- Property Requirements
- Capital Costs

Natural Environment

- Watercourses/Fisheries
- Vegetation and Woodlots
- Wildlife
- Natural Heritage Systems Connectivity
- Wetlands/Marsh Areas
- Fluvial Geomorphology Conditions
- Groundwater/Surface Water Interaction

Social/Cultural/Economic Environment

- Proximity impacts (noise impacts, aesthetics)
- Property Impacts and Compatibility with Existing Land Use
- Future Development/Redevelopment Potential and Compatibility with Future Land Uses/Plans
- Consistency with Provincial Planning Policies
- Consistency with the Regional Official Plan
- Consistency with the Local Official Plan
- Archaeological Resources
- Built Heritage Resources and Rural Character
- Recreational Opportunities
- Future Development/Redevelopment Potential (Accessibility)
- Community Connectivity and Integration
- Air Quality
- Accommodation of Pedestrians and Cyclists

Exhibit 5-2 provides a complete assessment of the three alternative solutions identified in **Section 5.2**.

Based on the assessment, widening of Burnhamthorpe Road on an existing or new alignment is recommended to carry forward as the preferred solution on the basis of the following rationale:

Transportation Criteria

Burnhamthorpe Corridor widening/improvements is preferred from a transportation perspective because:

- Travel safety can be an issue with 8 to 10 general purpose lanes within the Dundas Street corridor.
- Dundas Street widening to 8 to 10 lanes is not compatible with the Halton Region Transportation Master Plan, June 2004 or North Oakville development plans.
- Dundas Street has been identified as a future rapid transit corridor which would be less effective with 8 to 10 general purpose lanes.

Natural Environment

Dundas Street widening is preferred from a natural environment perspective because:

- Less impacts to natural environmental features/systems with exception of groundwater and surface water drainage.

Social/Cultural/Economic Environment

Burnhamthorpe Road Corridor widening/improvements is preferred from a social/cultural/economic perspective because:

- Burnhamthorpe has fewer impacts on most criteria except for potential impacts to archaeological resources.
- Impacts to individual residential properties (displacements plus property impacts, especially to frontage).

Engineering/Cost

Burnhamthorpe Road Corridor widening/improvements is preferred from an engineering and cost perspective because:

- Dundas Street widening has higher engineering impacts in terms of construction staging, utility relocations and number of affected properties.
- Costs of Dundas Street widening and Burnhamthorpe Road widening may be comparable. Burnhamthorpe Corridor costs are route dependent as the highest costs relate to length of route and location and length of the Sixteen Mile Creek crossing. Widening Burnhamthorpe Corridor on its existing alignment would also require a new bridge crossing over Highway 407.

5.4 THE RECOMMENDED ALTERNATIVE SOLUTION

The assessment of the three alternative solutions summarized in Section 5.3 resulted in the following recommendations:

- Widening of the Burnhamthorpe Corridor from Bronte Road to Ninth Line on the existing or new alignment, including a new crossing of Sixteen Mile Creek, will be carried forward to the next phase of the Study to develop and assess alternative routes (design concepts);
- Transit supportive/dedicated infrastructure will be considered as part of the solution for Burnhamthorpe Road;
- TDM, TSM and Enhanced Transit Services are recommended on a Region-wide basis as components of the overall transportation strategy as per Halton Region's Transportation Master Plan;
- The widening of Dundas Street will not be carried forward as a transportation solution to the identified problems and opportunities in the Study Area; and
- The Do Nothing alternative will be carried forward as a benchmark for comparison.

Exhibit 5-2: Assessment of Short List of Alternative Solutions

	DO NOTHING	ROAD SYSTEM EXPANSION (Bronte Road to Ninth Line)	
		Dundas Street Widening (8-10 Lanes)	Burnhamthorpe Corridor Widening/Improvements (4 Lanes) Existing or New Alignment
TRANSPORTATION			
Accommodation of Future Travel Demand	<ul style="list-style-type: none"> Regional and local roadways in the Study Area cannot accommodate current or future travel demands at an acceptable level of service. Congestion and delay will increase over time. 	<ul style="list-style-type: none"> Provides required capacity to accommodate forecast travel demand through Study Area. Widening to 10 lanes would be required if transit ridership through the Study Area remains at the current ridership levels in the Town of Oakville (approximately 7-8%). 	<ul style="list-style-type: none"> Provides required capacity to accommodate forecast travel demand through the Study Area.
Traffic Operations	<ul style="list-style-type: none"> Recurring congestion and delay will increase over time. Accessibility to properties will degrade. Traffic infiltration on local roads will increase. 	<ul style="list-style-type: none"> Restrictions to local access will be required. Limited dedicated turn lanes and turn restrictions required at crossing roads. Grade separations of major intersections may be necessary. 	<ul style="list-style-type: none"> A grid of 4 and 6 lane arterial roads provides improved traffic operations over a single 8-10 lane corridor and allows for improved through access, turning moves at intersections. Removes requirements for grade separations.
Travel Safety	<ul style="list-style-type: none"> Traffic congestion will increase in the Study Area over time. Potential for collisions will increase over time due to degraded operations, especially at intersections. 	<ul style="list-style-type: none"> A widened Dundas Street will be less safe during off-peak hours due to increased travel speed. In addition, stop-controlled accesses to an 8-10 lane road may be less safe than that of a 6 lane road. 	<ul style="list-style-type: none"> Reduced traffic congestion in the Study Area will result in improved travel safety.
Emergency Services	<ul style="list-style-type: none"> As regional and local roadway congestion increases in the Study Area, emergency response time will increase. 	<ul style="list-style-type: none"> Improve response times to areas along Dundas Street. 	<ul style="list-style-type: none"> Improves emergency response times in Study Area by providing an alternate east-west route.
Road Network Compatibility (with the TMP)	<ul style="list-style-type: none"> Inconsistent with the proposed system and function of roads recommended by the TMP. 	<ul style="list-style-type: none"> A widening beyond 8 lanes (including 2 lanes for HOV) is inconsistent with the function and character of Dundas Street as recommended in the TMP. 	<ul style="list-style-type: none"> Consistent with the system and function of roadways recommended by the Region's TMP.
Transit Network Connectivity	<ul style="list-style-type: none"> A network of transit routes is required to effectively serve approved development in the Study Area. 	<ul style="list-style-type: none"> A network of transit routes is required to serve approved development in the Study Area. 	<ul style="list-style-type: none"> The transit network will be improved by an east-west connection along Burnhamthorpe Corridor. A new alignment that directly connects to the approved development area west of Regional Road 25 provides a greater benefit.
Commercial Goods Movement	<ul style="list-style-type: none"> Commercial goods movement in the Study Area will degrade over time with increased congestion and delay. 	<ul style="list-style-type: none"> Provides effective east-west connection within Study Area. 	<ul style="list-style-type: none"> Somewhat effective at serving long distance commercial goods movement through Study Area. Serves as a local connection between approved developments in the Study Area.
Accommodation of Pedestrian/ Cyclists	<ul style="list-style-type: none"> Existing east-west and other Study Area roadways do not exclusively accommodate pedestrians and cyclists. Provision for cyclists and pedestrians within existing corridors may be limited by right-of-way. 	<ul style="list-style-type: none"> Pedestrian and cyclist crossing of an 8-10 lane road is a safety and operational concern. An 8-10 lane road is less appropriate for on-road cycling. Pedestrian and cyclist opportunities would need to be well separated from the roadway (more costly and requires additional right-of-way). 	<ul style="list-style-type: none"> Opportunity to accommodate pedestrians and cyclists (sidewalks, bike lanes, on-road routes, etc.) along upgraded Burnhamthorpe Corridor.

Exhibit 5-2: Assessment of Short List of Alternative Solutions

	DO NOTHING	ROAD SYSTEM EXPANSION (Bronte Road to Ninth Line)	
		Dundas Street Widening (8-10 Lanes)	Burnhamthorpe Corridor Widening/Improvements (4 Lanes) Existing or New Alignment
NATURAL ENVIRONMENT			Note: Impacts can vary substantially depending on route alignment. Existing Burnhamthorpe Corridor used in determination of impacts.
Watercourses/Fisheries	<ul style="list-style-type: none"> No impact to watercourses or fisheries. 	<ul style="list-style-type: none"> Total Watercourse Crossings: 17 <ul style="list-style-type: none"> Permanent Coldwater: 2 Permanent Coolwater: 3 Intermittent Coldwater: 1 Intermittent Coolwater: 1 Expansion of existing crossing of Sixteen Mile Creek. Existing access road at Sixteen Mile Creek minimises construction impacts to the valley. 	<ul style="list-style-type: none"> Total Watercourse Crossings: 19 <ul style="list-style-type: none"> Permanent Coldwater: 0 Permanent Coolwater: 1 Intermittent Coldwater: 1 Intermittent Coolwater: 3 New crossing of Sixteen Mile Creek required.
Vegetation and Woodlots	<ul style="list-style-type: none"> No impact to vegetation or woodlots. 	<ul style="list-style-type: none"> Area of woodlot in footprint: 1.38 ha Area of significant woodlot in footprint: 0.56 ha Area of Environmentally Significant (ES) ANSI in footprint: 1.50 ha Area of Life Science (LS) ANSI in footprint: 0 ha 	<ul style="list-style-type: none"> Area of woodlot in footprint: 1.71 ha Area of significant woodlot in footprint: 1.71 ha Area of ES ANSI in footprint: 5.33 ha Area of LS ANSI in footprint: 6.63 ha
Wildlife	<ul style="list-style-type: none"> No impact to wildlife. 	<ul style="list-style-type: none"> Total Element Occurrences within 1 km of footprint: 21 Total rare species within 1 km of footprint: 4 	<ul style="list-style-type: none"> Total Element Occurrences within 1 km of footprint: 6 Total rare species within 1 km of footprint: 1
Natural Heritage Systems Connectivity	<ul style="list-style-type: none"> No impact to natural heritage systems connectivity. 	<ul style="list-style-type: none"> Existing crossing of Sixteen Mile Creek and existing valley access road (for construction) minimizes impact to ANSI. Total area of core preserve and linkage preserve area in footprint: 3.97 ha. 	<ul style="list-style-type: none"> New crossing of Sixteen Mile Creek ANSI required. Valley access road required for construction. Total area of core preserve and linkage preserve area in footprint: 4.70 ha.
Wetlands/Marsh Areas	<ul style="list-style-type: none"> No impact to wetlands/marsh areas. 	<ul style="list-style-type: none"> Number of wetlands within expansion footprint: 3 Number of wetlands within 120 m of right of way footprint (north of existing road): 6 	<ul style="list-style-type: none"> Number of wetlands within expansion footprint: 5 Number of wetlands within 120 m of footprint (north of the existing road): 8
Fluvial Geomorphology Conditions	<ul style="list-style-type: none"> No impact to geomorphic conditions. 	<ul style="list-style-type: none"> New footing raises the construction potential for the existing channel bed to be disturbed by the footings themselves or their construction. Potential for an adjustment in flow or sediment regime which could result in a corresponding adjustment of the channel shape and profile. Potential for the channel to become unstable if the movement of water and sediment is altered through the construction of the crossing or the footings involved. Potential removal of area available for floodwaters and sediment storage in the floodplain because of the footings required, and therefore an increase in the amount of bed and bank erosion observed in the channel. 	<ul style="list-style-type: none"> Requires the construction of a crossing through the valley lands of Sixteen Mile Creek. The existing road alignment would cross the valley lands and creek on an angle, crossing at a straight, narrow section of the channel. New crossing should span the meander belt width of the channel and not hinder the natural progression the channel through the valley. Increased risk of erosion and backwater as a result of the installation of the footings. Risk of increased bank erosion as a result of the removal of bank vegetation for the construction of the crossing, as well as the removal of available storage within the floodplain for sediment and water.
Groundwater/Surface Water Interaction	<ul style="list-style-type: none"> No impacts to groundwater, surface water interactions or drainage. 	<ul style="list-style-type: none"> Area of permeable soil in footprint: 23.7 ha 	<ul style="list-style-type: none"> Area of permeable soil in footprint: 19.5 ha

Exhibit 5-2: Assessment of Short List of Alternative Solutions

	DO NOTHING	ROAD SYSTEM EXPANSION (Bronte Road to Ninth Line)	
		Dundas Street Widening (8-10 Lanes)	Burnhamthorpe Corridor Widening/Improvements (4 Lanes) Existing or New Alignment
SOCIAL/CULTURAL/ECONOMIC ENVIRONMENT			
Proximity Impacts (noise impacts, aesthetics)	<ul style="list-style-type: none"> Minor sound level increase with increased traffic congestion. No change to appearance of area. 	<ul style="list-style-type: none"> Potential for significant noise impacts on adjacent property along Dundas; noise attenuation may be required. Significant visual and physical barrier between existing urban area and North Oakville. 	<ul style="list-style-type: none"> Minor noise impacts on existing land uses along Burnhamthorpe Road associated with widening (roadway closer to existing buildings) and volume (more capacity). Changes rural character/appearance of roadway to urban standard (curbs and gutter, sidewalks, etc.). Requires removal of existing road-side trees and hedgerows in some locations. A new alignment would sever multiple properties.
Property Impacts and Compatibility with Existing Land Use	<ul style="list-style-type: none"> No direct impact on existing land uses/properties. Indirect impacts related to increased traffic congestion/proximity, and increased difficulty accessing adjacent properties. 	<ul style="list-style-type: none"> Widening to 8-10 lanes is not compatible with existing land use on both sides of Dundas. Existing access to properties may be eliminated. Displacement of some existing land uses along Dundas required to accommodate widening. 	<ul style="list-style-type: none"> Changes rural character/appearance to urban standard along existing Burnhamthorpe Road. Front yard depth reduced to accommodate right-of-way required for additional lanes, sidewalks, boulevard, etc. A new alignment would displace some existing land uses (residential and farm) and existing building (homes, farm buildings) and affect the continued use of some lands for agriculture.
Future Development/Redevelopment Potential and Compatibility with Future Land Uses/Plans	<ul style="list-style-type: none"> Restricts ability to implement the vision and urban structure set out in North Oakville Secondary Plan (NOSP) designed to achieve Regional (and Local) population and employment targets for the “Urban Area” designation. Restricts provision of public roadway access/capacity and other infrastructure required for future development. Lack of public infrastructure may hinder/delay development interests in North Oakville. 	<ul style="list-style-type: none"> Planned concept of future land use along Dundas Street is for “visually connected” mixed use development; additional setbacks and possible noise attenuation required for an 8-10 lane roadway restricts implementation of this concept. Accessibility to proposed development areas in North Oakville severely affected by concentrating capacity improvements on Dundas Street. 	<ul style="list-style-type: none"> Supports future development. The degree of compatibility and support for the planned land use patterns/urban structures being considered will depend on route alignment in relation to Secondary Plan
Consistency with Provincial Planning Policies	<ul style="list-style-type: none"> Inconsistent with policies for the timely provision of required infrastructure in designated growth areas, providing transportation systems appropriate to addressing projected needs, and improving connectivity within and among transportation systems crossing municipal boundaries. 	<ul style="list-style-type: none"> Inconsistent with the objectives to provide required infrastructure for development in designated growth areas and improve connectivity within and among transportation systems crossing municipal boundaries. Optimizes the use of existing infrastructure; supports the Provincial direction to provide for alternative modes of transportation and priority to transit. 	<ul style="list-style-type: none"> Consistent with the objective to provide required infrastructure for development in designated growth areas, improving connectivity within and among transportation systems crossing municipal boundaries, and supporting the Provincial direction to provide for alternative modes of transportation and priority to transit. The degree to which solution optimizes the use of existing infrastructure is dependent on route alignment in relation to Secondary Plan
Consistency with the Regional Official Plan	<ul style="list-style-type: none"> Inconsistent with policies for developing a balanced transportation system, improving transportation network efficiency and the designated function of Burnhamthorpe Road as a “Major Arterial” roadway. 	<ul style="list-style-type: none"> Inconsistent with the concept of a balanced transportation system (focuses transportation requirements into one corridor instead of balancing among many corridors). 	<ul style="list-style-type: none"> Consistent with policies for a balanced transportation system (balances capacity of area roadways) and the Plan’s designated function of Burnhamthorpe Road as a “Major Arterial” roadway.
Consistency with the Local Official Plan	<ul style="list-style-type: none"> Inconsistent with policies to establish a transportation system that complements and supports the future urban structure and land use pattern and which can be easily and economically serviced by transit. 	<ul style="list-style-type: none"> Barrier created between existing and future development is inconsistent with local policies to establish a transportation system that complements and supports the future urban structure and land use pattern. 	<ul style="list-style-type: none"> Consistent with policies to establish a transportation system that complements and supports the future urban structure and land use pattern. Effectiveness of solution in achieving local objectives related to supporting alternative modes is dependent on route alignment in relation to Secondary Plan.

Exhibit 5-2: Assessment of Short List of Alternative Solutions

	DO NOTHING	ROAD SYSTEM EXPANSION (Bronte Road to Ninth Line)	
		Dundas Street Widening (8-10 Lanes)	Burnhamthorpe Corridor Widening/Improvements (4 Lanes) Existing or New Alignment
Archaeological Resources	<ul style="list-style-type: none"> No impact to archaeological sites. 	<ul style="list-style-type: none"> Dundas Street ROW contains typical disturbances (drainage ditches, gravel shoulders). Beyond ROW limits, landscape is a mixture of new development, rural frontage and agricultural fields. Due to high pre-contact potential of the immediate area, any undisturbed locations within 300m or less to creek crossings are rated high in potential for encountering significant archaeological remains. 	<ul style="list-style-type: none"> Corridor undisturbed, adjacent to residential rural frontage and agricultural fields, thus, establishing high potential for encountering significant archaeological remains.
Built Heritage Resources and Rural Character	<ul style="list-style-type: none"> No impact to built heritage or rural character. 	<ul style="list-style-type: none"> Impacts to at least 9 identified character buildings located along Dundas. Widening may result in need to re-locate or remove existing character buildings on north side of Dundas. 	<ul style="list-style-type: none"> Impacts associated with reduced front yard depth for 6 identified character buildings located along Burnhamthorpe Road. Rural character of the existing roadway would be lost. New alignment could avoid or significantly reduce impacts.
Recreational Opportunities	<ul style="list-style-type: none"> No impact on existing recreational opportunities. Access to and connectivity of planned urban land uses with existing and future recreational opportunities may be limited. 	<ul style="list-style-type: none"> Public parkland/trail access at Dundas Street bridge over Sixteen Mile Creek would be impacted by additional bridge crossing; also potential impacts on existing private recreational opportunities along Dundas Street (golf course and driving range). Planned Community Park on north side of Dundas Street may be impacted; widened roadway may be a barrier to connections between existing and future recreational opportunities. 	<ul style="list-style-type: none"> No direct impact on existing recreational opportunities. Provides opportunity for transportation link between planned urban land uses and future parks and open space areas identified in local plans.
Future Development/Redevelopment Potential (Accessibility)	<ul style="list-style-type: none"> Potential indirect impacts on access to individual properties due to traffic congestion. Limits access to lands in North Oakville for future/planned urban development. 	<ul style="list-style-type: none"> Potentially significant barrier to access across Dundas for existing land uses; Barrier to access across Dundas Street between existing urban area and future development; also may limit access to internal development areas north of Dundas. 	<ul style="list-style-type: none"> Additional capacity will improve access to existing uses and surrounding areas (reduced congestion on area roadways). Provides east-west access for future development and connects future land uses to surrounding urban environments.
Community Connectivity and Integration	<ul style="list-style-type: none"> Potential disruption of “connectivity” of the existing (rural) community and links to surrounding areas due to increased volume/congestion of traffic in and around the Study Area. Restricts the ability to provide strong connections among and between planned/future land uses (residential, employment, institutional, open space, etc.), which is fundamental in achieving the development objectives for the area as set out in the North Oakville Secondary Plan; it also may restrict connections between future development and the surrounding urban environments. 	<ul style="list-style-type: none"> Barrier to connectivity between existing North Oakville community and the urban service area south of Dundas Street. Disconnects planned North Oakville community from existing urban area; restricts ability to provide strong internal east-west connections to approved development areas west of Regional Road 25. 	<ul style="list-style-type: none"> Wider road on existing or new alignment may reduce connectivity across Burnhamthorpe Corridor by formalizing locations for pedestrian crossing. Connectivity within the area and to surrounding areas would be improved with increased capacity. Provides an internal east-west corridor connecting all land use elements of the planned community, linking future employment, residential, parks and open space areas on both sides of Sixteen Mile Creek and to lands west of Bronte Road (Regional Road 25).
Air Quality	<ul style="list-style-type: none"> Minor decrease in localized air quality levels with increased traffic congestion. Not consistent with the Region’s Air Quality Strategy. 	<ul style="list-style-type: none"> Minor decrease in localized air quality with the widening of Dundas Street for general purpose traffic. Improved transit on Dundas Street is consistent with the Region’s Air Quality Strategy. 	<ul style="list-style-type: none"> Minor decrease in localized air quality with widening of the Burnhamthorpe Corridor. Improved transit on Burnhamthorpe Corridor is consistent with the Region’s Air Quality Strategy.
Accommodation of Pedestrians and Cyclists	<ul style="list-style-type: none"> Existing east-west and other Study Area roadways do not expressly accommodate pedestrians and cyclists. Provision for cyclists and pedestrians within existing corridors may be limited by right-of-way. 	<ul style="list-style-type: none"> Difficult to safely accommodate efficient pedestrian and cyclist crossing of an 8-10 lane road. An 8-10 lane road is not appropriate for on-road cycling; pedestrian and cycling opportunities would need to be well-separated from the roadway (more costly and requires additional right-of-way width). 	<ul style="list-style-type: none"> Opportunity to accommodate pedestrians and cyclists (sidewalks, bike lanes, on-road routes, etc.) along upgraded Burnhamthorpe Corridor.

Exhibit 5-2: Assessment of Short List of Alternative Solutions

	DO NOTHING	ROAD SYSTEM EXPANSION (Bronte Road to Ninth Line)	
		Dundas Street Widening (8-10 Lanes)	Burnhamthorpe Corridor Widening/Improvements (4 Lanes) Existing or New Alignment
ENGINEERING			
Construction Impacts	<ul style="list-style-type: none"> No construction impacts. 	<ul style="list-style-type: none"> Major impacts and disruption to existing residences and businesses along corridor. 8-10 lane arterial may require grade separations with other arterial roads extending disruptions beyond immediate corridor. 	<ul style="list-style-type: none"> Moderate impacts and disruption to existing residences and businesses operating within the Study Area. New alignment could reduce construction impacts.
Utility and Service Relocations	<ul style="list-style-type: none"> No impact to existing utilities and services. 	<ul style="list-style-type: none"> Potential for major impacts to existing utilities and services along Dundas Street. 	<ul style="list-style-type: none"> Potential for minor impacts to existing utilities and services in the area including the crossing of a natural gas pipeline.
Property Requirements	<ul style="list-style-type: none"> No property required. 	<ul style="list-style-type: none"> Additional property required along Dundas Street beyond existing right-of-way to accommodate an 8-10 lane widening. 	<ul style="list-style-type: none"> For existing alignment, additional property would be required beyond the existing right-of-way to accommodate improvements to Burnhamthorpe Corridor. Entire new right-of-way required for new alignment. Potential to designate portions of corridor to Region through development applications.
Capital Costs	<ul style="list-style-type: none"> No direct construction, property acquisition or utility relocation costs. 	<ul style="list-style-type: none"> Major costs associated with widening roadway, new bridge at Sixteen Mile Creek and potential grade separations at major arterial intersections of Trafalgar Road and Bronte Road. Major costs for property and utility relocation. 	<ul style="list-style-type: none"> Major costs associated with widening Burnhamthorpe Corridor and providing a new bridge over Sixteen Mile Creek. Widening Burnhamthorpe Corridor on existing alignment would also require a new bridge crossing over Highway 407. Moderate cost for property and utilities. Potential to recover a portion of the costs through Development Charges.
Preliminary Ranking		<p>Transportation Criteria</p> <ul style="list-style-type: none"> Travel safety can be an issue with 8 to 10 general purpose lanes within the Dundas Street corridor. Dundas Street widening to 8 to 10 lanes is not compatible with the Halton Region Transportation Master Plan or North Oakville development plans. Dundas Street has been identified as a future rapid transit corridor which would be less effective with 8 to 10 general purpose lanes. <p>Natural Environment</p> <ul style="list-style-type: none"> Burnhamthorpe Road widening has fewer impacts to natural environmental features/systems with the exception of groundwater and surface water drainage. <p>Social/Cultural/Economic Environment</p> <ul style="list-style-type: none"> Burnhamthorpe Road has fewer impacts on most criteria except for potential impacts to archaeological resources. Burnhamthorpe Road has less potential impacts to individual residential properties (displacements plus property impacts, especially to frontage) than a Dundas Street widening. <p>Engineering/Cost</p> <ul style="list-style-type: none"> Dundas Street widening has higher engineering impacts in terms of construction staging, utility relocations and number of affected properties. Costs of Dundas Street widening and Burnhamthorpe Road widening may be comparable. Burnhamthorpe Road costs are route dependent as the highest costs relate to length of route and location and length of the Sixteen Mile Creek crossing. Widening the Burnhamthorpe corridor on its existing alignment would also require a new bridge crossing over Highway 407. 	
	<ul style="list-style-type: none"> <i>Carry forward as base case for comparison.</i> 	<ul style="list-style-type: none"> <i>Do not carry forward Dundas Street as a transportation alternative solution.</i> 	<ul style="list-style-type: none"> <i>Carry Burnhamthorpe Corridor widening/improvements alternative forward to the next phase of study.</i>