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*Committed to Total Service Excellence*

**BRYNE DRIVE (CAPLAN AVENUE TO ESSA ROAD)  
MASTER PLAN UPDATE  
ADDENDUM #1**

**MUNICIPAL CLASS ENVIRONMENTAL  
ASSESSMENT PHASE 1 & 2**

***March 2016***

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## 1.0 BACKGROUND

### 1.1 Introduction and Purpose

The purpose of the update is to identify and reassess roadway alignment alternatives for a future five-lane road extension of Bryne Drive between Caplan Avenue and Essa Road. The 2005 Bryne Drive Master Plan identified the need to protect for a potential future Highway 400 interchange at Harvie Road / Big Bay Point Road. A setback from the potential future Highway interchange is required to protect for a future interchange and a realignment of future Bryne Drive is required to accommodate this setback. Realignment of Bryne Drive is also required to accommodate the Highway 400 Crossing over Highway 400 with respect to the road profile.

Meetings were held throughout the Master Plan update process and copies of the meeting minutes are included in Appendix "L". A map of the Study Area is provided in Figure 1.

### 1.2 Problem or Opportunity

The Problem Statement as defined in the original documentation is:

*That existing traffic and infrastructure deficiencies be corrected in an environmentally friendly manner, which also meets future transportation needs.*

### 1.3 Objectives of the Report

The Objectives of the Master Plan Update Report are to:

- Identify Alignment Alternatives (Caplan Avenue to Essa Road) that are compatible with a Highway Crossing over Highway 400 and a potential future interchange;
- Receive and respond to comments as a result of a Public Information Centre held on August 21, 2008;
- Select a Preferred Alignment Alternative;
- Document the Master Plan Update as an Addendum to the December 2005 Document.

## 2.0 ADDITIONAL STUDIES

The Bryne Drive Master Plan Update was put on hold in 2010 to allow the completion of the Multi-Modal Active Transportation Master Plan and the Harvie Road / Big Bay Point Road / Highway 400 Phase 3 & 4 Class EA.

### 2.1 Multi-Modal Active Transportation Masterplan

On December 2, 2013, City Council adopted motion 13-G-289 regarding Growth Management Update: Infrastructure Master Plans and Fiscal Impact Analysis as follows:

“That the six Infrastructure Master Plans (Water Supply, Water Storage and Distribution, Wastewater Treatment, Wastewater Collection, Drainage and Stormwater Management, and Multi-Modal Active Transportation) related to growth from 2012-2031 be approved so that staff may complete the public consultation process in accordance with the Municipal Class Environmental Assessment process.”

The preferred alternative solution from Phase 1 & 2 of the Class Environmental Assessment (Class EA) process completed as part of the Multi-Modal Active Transportation Master Plan (MMATMP) endorsed by Council, recommended five lanes on Bryne Drive with regular bike lanes from south of Essa to north of Caplan and a new partial Highway 400 interchange / crossing implemented in phases.

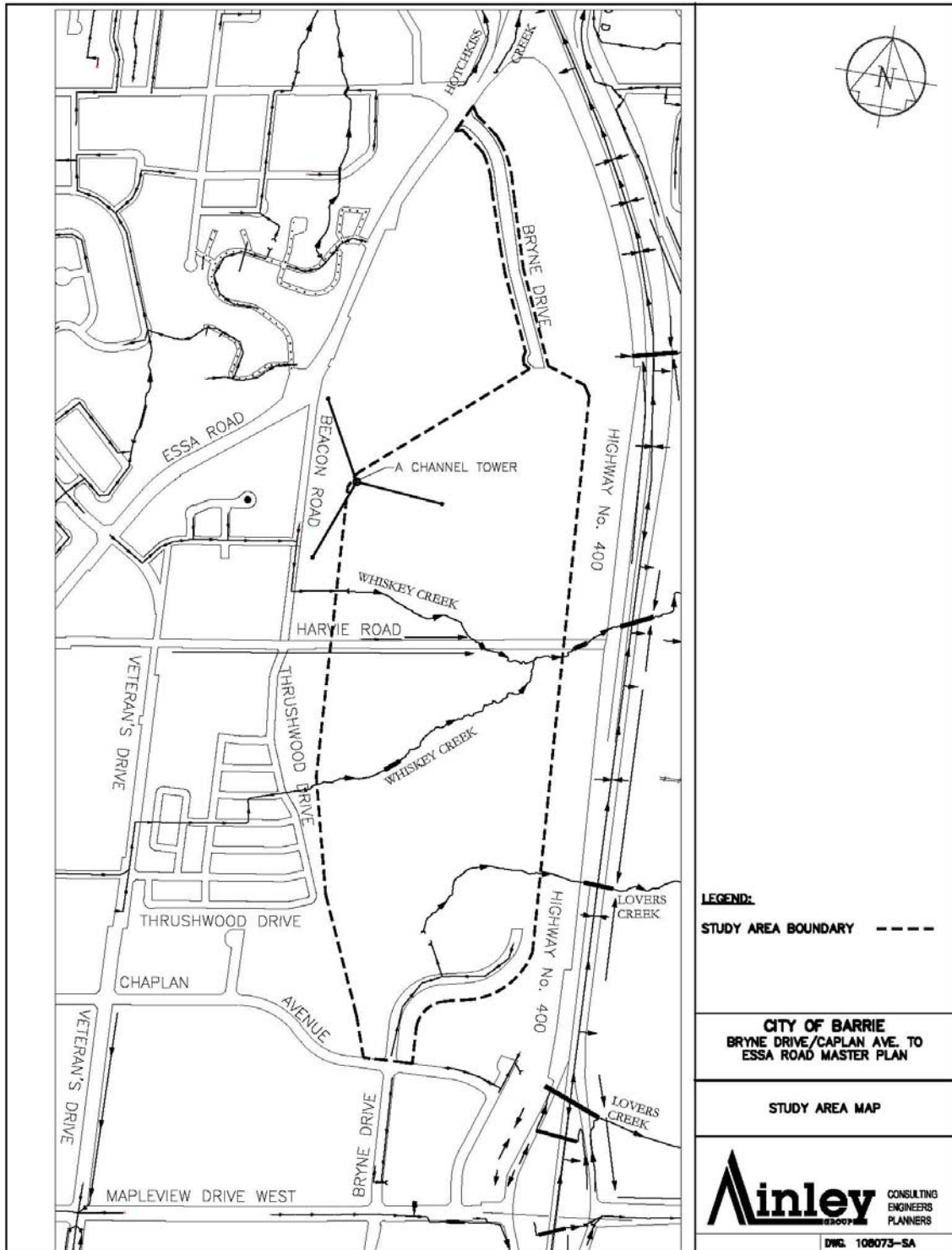
### 2.2 Harvie Road / Big Bay Point Road / Highway 400 Phase 3 & 4 Class EA

On October 5, 2015, City council adopted motion 15-G-200 associated with the Harvie Road/ Big Bay Point Road / Highway 400 Phase 3 & 4 Class EA. The preferred design solution included the following elements:

- Harvie Road / Big Bay Point Road crossing over Highway 400;
- Removal of the existing railway crossing on Big Bay Point Road between Bayview Drive and Fairview Drive;
- Buffered bike lanes and sidewalks on both sides;
- Five (5) lanes in the interim and ultimate seven (7) lanes between Bryne Drive and Bayview Drive;
- Protection of land for a potential future Highway interchange.

### 2.3 HCM Traffic Operations & Queue Analysis

An additional traffic analysis was completed in September 2012 by Ainley & Associates using Synchro/Simtraffic to assess the traffic operations and queue analysis associated with Alternative 3R. The traffic analysis concluded that there will be no queues spillback onto Highway 400 at both Highway 400 off-ramp associated with a potential interchange. Further details are provided in the aforementioned memo which can be found in Appendix “G”.



**Figure 1 - Study Area Map**

### 3.0 ALIGNMENT ALTERNATIVES

#### 3.1 General

Prior to the identification of alternative roadway alignments, several factors must be considered as follows:

- Moving the Bryne Drive/Harvie Road intersection further west may impact the existing stormwater management ponds on the southern branch of Whiskey Creek;
- A crossing of the northern branch of Whiskey Creek is necessary if the alignment is moved west;
- A crossing of a tributary to Lover's Creek in the south end of the Study area is necessary regardless of which alignment is selected;
- The new roadway is to be 5 lanes wide;
- Active transportation;
- The locations of existing utilities (sanitary, water, hydro etc) shall be taken into account when assessing alignment alternatives. There is an existing sanitary trunk sewer main crossing the Study Area south of Harvie Road. There are also existing trunk watermains within the Harvie Road ROW;
- The proposed Bryne Drive alignment needs to tie into the existing Bryne Drive southern extent south of Essa Road;
- The proposed Bryne Drive alignment needs to tie into either the existing Bryne Drive northern extent north of Caplan Avenue or alternatively into the unopened proposed Bryne Drive road allowance to the east of Princess Auto;
- MTO has historically asked that the distance from the centre of the Bryne Drive intersection with Harvie Road to a future Highway 400 south bound off ramp should be at least 365 m unless it can be shown to work with a lesser distance through traffic analysis;
- The lands on the east side of Beacon Road are developed with a television station known as CTV and includes a communications tower (complete with tower support cables) and an existing hydro line. There is also an existing satellite dish facility on the north side of Harvie Road;
- The lands on the east side of Thrushwood Drive have been developed as residential and any proposed alignment shift closer to existing residential areas may result in a negative impacts;



- There is an existing occupied house on the north side of Harvie Road just east of a tributary to Whiskey Creek; and
- The proposed alignment should allow for reasonable development of adjacent industrial/commercial lands.

In summary, the available suitable lands for the future Bryne Drive alignment between Caplan Avenue and Essa Road are limited to a north/south corridor within the approximate centre of the Study Area. Six Alignment Alternatives were considered and are described in Sections 3.2 to 3.7.

### 3.2 Alternative 1 - Do Nothing, Direct Future Traffic Onto Surrounding Streets

Under this alternative, existing and future traffic would be required to use existing roadways such as Highway 400, Mapleview Drive West, Veteran's Drive and Essa Road. There would be no direct traffic access into and through the Study Area lands. Traffic congestion on the existing above-mentioned roads would increase due to future development in the area.

### 3.3 Alternative 2 - Original December 2005 Class Environmental Assessment (EA) Alignment

This Alternative is the five-lane roadway alignment that was previously outlined in the December 2005 Class EA. The alignment connects to the existing Bryne Dr. extents off of Essa Road and Caplan Avenue and runs in a north/south direction parallel to and just west of Highway 400. It would cross Harvie Road at a location that would conflict with a possible future Highway interchange and would also conflict with the highway crossing with regard to meeting road profiles. The alignment would cross both Lover's Creek and Whiskey Creek at close to 90° angles, which is considered to cause the least environmental impact. In addition, the crossing of Whiskey Creek is downstream of the confluence of the southern and northern branches, thus eliminating the need for an extra crossing (required for other alternatives). Also, the crossing of Whiskey Creek is well downstream of the existing stormwater management pond. The alignment requires removal of trees between Harvie Road to the north connection of Bryne Drive (common to Alternatives 2 to 5). Please refer to drawing Alt 2 in Appendix "B".

### 3.4 Alternative 3 – Central Alignment

This five-lane roadway alignment is located approximately 180m (measured along Harvie Road) west of Alternative 2. The southern half begins part way along existing Bryne Drive just east of Princess Auto, which is north of Caplan Avenue and extends north to Harvie Road just west of the existing satellite dishes. The alignment would require a crossing of the existing Whiskey Creek storm water management pond berm. The northern half of the proposed alignment would start at Harvie Road and would extend north to the end of existing Bryne Drive at the current location of Leon's Furniture. The southern portion of the Alternative 3 Alignment will have a minor impact on the existing stormwater management pond

LV14 located just north of Caplan Avenue. Please refer to drawing Alt 3 in Appendix “B”.

3.5 Alternative 3R – Modified Central Alignment

This Alternative is similar to Alternative 3 with a slight westerly alignment shift north of Harvie Road making it more acceptable for future development potential in that area. The environmental impacts would be similar to Alternative 3. Please refer to drawings RC1 to RC9 in Appendix “B”.

3.6 Alternative 4 – Western Alignment – 90° Crossing of Harvie Road

This five-lane roadway alignment is located approximately 260 m (measured along Harvie Road) west of Alternative 2. The southern half begins part way along the existing extent of Bryne Drive just east of Princess Auto, which is north of Caplan Avenue and extends north to Harvie Road to a point that is furthest from the potential Harvie Road/Highway 400 interchange ramps. The northern half of the proposed alignment would start at Harvie Road and would extend north to the end of existing Bryne Drive at the current location of Leon’s Furniture, avoiding the existing CTV communications tower. The alignment would require a crossing of the Whiskey Creek stormwater management pond, likely with a bridge. A crossing of the north branch of Whiskey Creek would be necessary. The southern portion of the Alternative 4 Alignment will have a minor impact on the existing stormwater management pond LV14 located just north of Caplan Avenue. Please refer to drawing Alt 4 in Appendix “B”.

3.7 Alternative 5 – Western Alignment – Angled Crossing of Harvie Road

This five-lane roadway alignment is similar to Alternative 4 except the intersection proposed at Harvie Road includes a deflection angle of 70°. The alignment reduces impacts to the existing Whiskey Creek stormwater management pond but still may require a bridge over the berm. The southern portion of the Alternative 5 Alignment will have a minor impact on the existing stormwater management pond LV14 located just north of Caplan Avenue. Please refer to drawing Alt 5 in Appendix “B”.

## 4.0 PROJECT ENVIRONMENT

Descriptions of the physical, social, cultural and economic environments were provided in the original Master Plan Document. The purpose of this section is to update the previously documented project environment and to add new information where available.

### 4.1 Physical Environment

#### 4.1.1 Traffic Volume

The MMATMP recommended a partial interchange in addition to the Highway crossing connecting Harvie Road to Big Bay Point Road. The PM peak traffic volumes from an additional traffic analysis which was completed in September 2012 by Ainley & Associates using Synchro is summarized in Figure 2 below.

**Figure 2 – 2031 PM Peak Hour Traffic Volumes**



#### 4.1.2 Geometrics

The design criteria used to identify and assess Alignment Alternatives 2, 3, 4, 5 and 3R are summarized below. The criteria are based on recognized Provincial standards as per the 1999 TAC “Geometric Design Guide for Ontario Roads”.

##### Geometric Design Standards for Undivided Urban Roads

- Design Speed V (in km/h)	= 70 km/h
- No of lanes	= 5
- Lane Width	= 3.5 m
- Shared Left Turn Lane	= 4.2 m
- Maximum Grade	= 6 – 12 %

##### Minimum Radius

- Design Speed	= 70 km/h
- e (super elevation)	= 0.04 m/m
- f (coefficient of side friction)	= 0.17 (TAC Figure 2.3.2.9)
- Minimum Radius assuming 4% super elevation	= 200 m (TAC Table 2.1.2.5)

$$\text{Minimum Radius} = V^2/[127 * (e+f)]$$

Where

e = pavement superelevation (tangent of the angle) the value of e being positive if the pavement slopes toward the centre of the curve; and

f = coefficient of side friction force between vehicle tire and road pavement

##### Crest and Sag Curvature, Headlight

- Design Speed	= 70 km/h
- K Values	= 25

Vertical curvature (K) is the horizontal distance along a parabolic curve required to effect a one percent change in gradient.

Super elevation is the gradient measured at right angles to the centre line across the roadway on a curve, from the inside to the outside edge.

The preliminary layouts for Alternatives 2, 3, 4, 5, and 3R are based on the above geometric criteria. During Phase 3 and 4 of the future Class EA study, the geometric design shall be confirmed during the development of the design concepts and selection of the preferred design alternative. Details of which to be documented accordingly and reflected on the preferred design alternative.

#### 4.1.3 Compatibility with Existing and Future Road Network

The compatibility of Alignment Alternative 2 with respect to the existing and future road network was discussed in the 2005 Bryne Drive Master Plan.

With respect to Alternatives 3, 4, 5, and 3R, they all intersect with Bryne Drive in the south end of the Study Area at a location that would result in a short portion of existing road being left as a dead-end with an existing cul-de-sac. It is possible that the proposed development road layout may be designed to connect to this existing cul-de-sac. It should be noted that the existing cul-de-sac does not meet the City's standard "Industrial Urban Cul-De-Sac detail BSD-08" (copy included in Appendix C) because the existing cul-de-sac is offset to the east rather than being centred on the Road Allowance. The City may decide to upgrade the existing cul-de-sac as part of the Bryne Drive extension. As such, it is recommended that potential upgrade options be considered during the future Class EA Phase 3 and 4 study.

#### 4.1.4 Compatibility with Proposed Development Layout

Alignment Alternatives 3, 4, 5, and 3R were developed, recognizing the preliminary development layouts north and south of Harvie Road, including proposed driveway and parking lot entrances. Alternative 2 is not compatible with the preliminary development layouts.

#### 4.1.5 Emergency Service

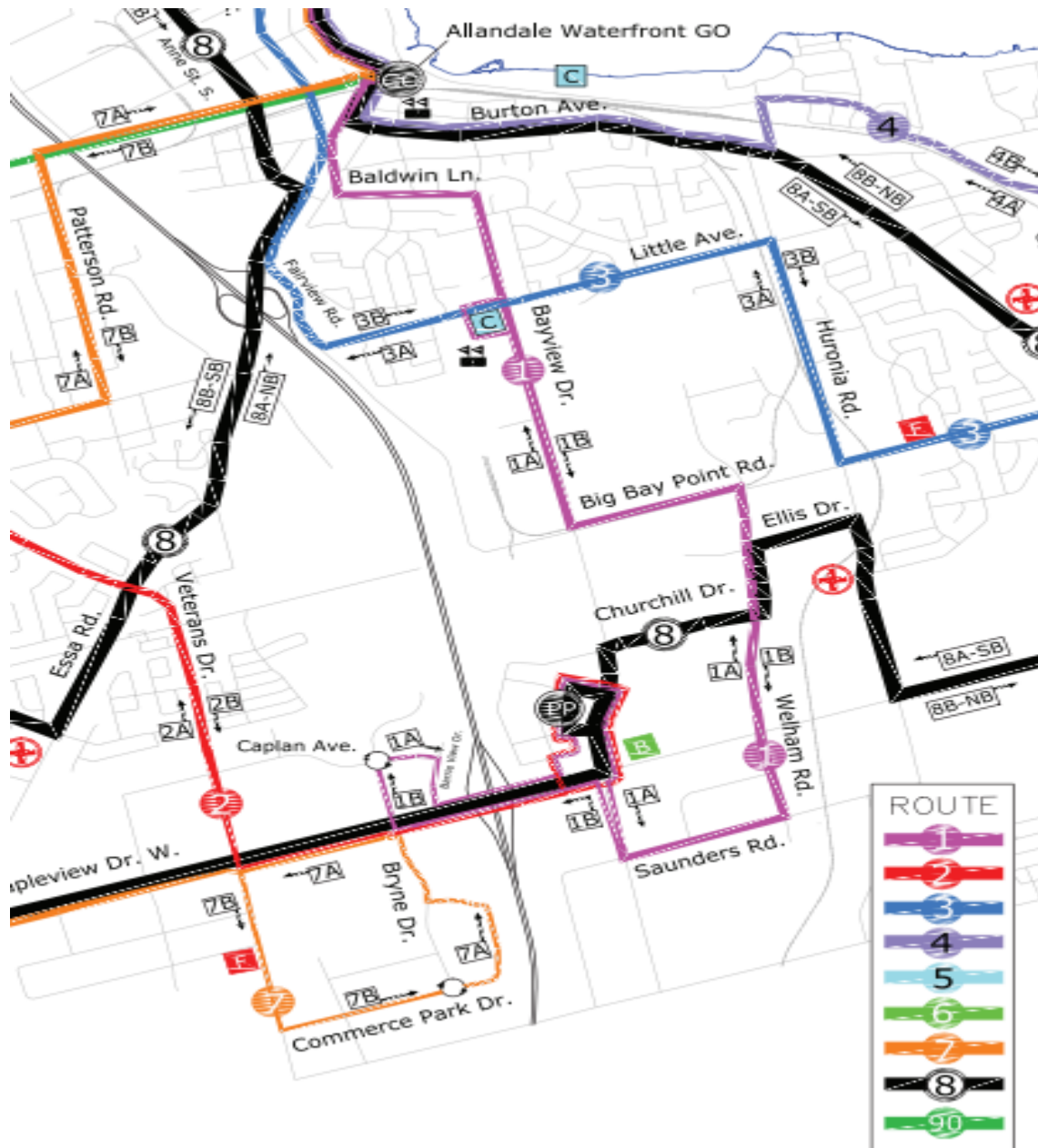
Emergency Police and Ambulance vehicles currently access the study area from either Essa Road, Mapleview Drive or Veteran's Drive.

Fire Station 4 is located on Ardagh Road, west of Ferndale Drive. Fire Station 5 is located south of Mapleview and west of Veteran's on King Street.

#### 4.1.6 Transit Service

Presently there are no bus routes in the study area. Existing bus routes surrounding the study area are shown on the Figure below. Transit routes may be added to Bryne Drive in the future.

**Figure 3 - Existing Transit Routes**



4.1.7 Safety

There is a history of mostly traffic congestion complaints for the area adjacent to Mapleview Drive. Winter safety complaints, in terms of slippery conditions, can be addressed with greater priority given to sanding, salting and ploughing.

The City of Barrie has an Advance Road Weather Information Tower in South Barrie which allows better prediction of road weather and winter maintenance needs.

#### 4.1.8 Impact on Road Capacity During Construction

For all Alternatives, construction will be required to complete the transitions onto the existing sections of Bryne Drive, both north and south. The current traffic volume on both of those dead-end streets is minimal (local traffic to area businesses) therefore the impact to traffic flow during construction will be minimal. The roads will be kept open during construction. There may be some disruption of traffic flow on Harvie Road but the traffic volume is expected to be minimal. Access to the existing house will need to be maintained at all times.

#### 4.1.9 Major Service/Utility Conflicts

The unopened section of Bryne Drive, both north and south of Harvie Road, does not have any existing utility infrastructure in place, other than a trunk sanitary sewer south of Harvie Road. The most convenient and economical time to install utility infrastructure is during the construction of new roads.

It is not anticipated that any of the existing sanitary sewers or watermains will require upgrading. The storm system will require relocation of catchbasins, to satisfy road widening and may require some localized storm system upgrades.

##### 4.1.9.1 Drainage

The constructed portion of Bryne Drive close to Essa Road and Caplan Avenue utilize storm pipes to convey minor rainfall events to a suitable outlet. Major storm events are conveyed via overland flow paths to a suitable discharge location.

The study area crosses three drainage areas: Lover's, Hotchkiss and Whiskey, each of which is part of the Lake Simcoe Watershed. There is an existing storm pond south of Harvie Road and west of Highway 400.

##### 4.1.9.2 Sanitary

There is an existing 525mm/600mm sanitary trunk sewer on Harvie Road, west of Highway 400. A 450mm sanitary sewer, located south of Harvey Road (west of Highway 400) connects to the trunk sewer on Harvey Road. Local sanitary sewers exist on Harvie Road further to the west and on the constructed portions of Bryne Drive to service existing development within the study area.

##### 4.1.9.3 Hydro

Overhead hydro currently exists on the south side of Harvie Road. The existing hydro line on the south side of Harvie Road would need to be relocated to accommodate the proposed road profile on Harvie Road and Bryne Drive.

#### 4.1.9.4 Water

Three trunk water mains currently exist under Harvie Road (750mm, 500mm and 400mm diameter). The 750mm water main was recently installed to supply the Harvie water reservoir from the Barrie Surface Water Treatment Plant.

The entire Study Area lies within the 3S Pressure Zone for water distribution.

#### 4.1.9.5 Telephone

Overhead telephone currently exist on the south side of Harvie Road.

#### 4.1.9.6 Gas

There is an existing 100 mm diameter gas main that is located on the west side of Bryne Drive from Commerce Park Drive to Home Depot and another 100 mm gas main on the east side of Bryne Drive from Leon's Furniture Ltd. to Essa Road. A gas line is also likely located on Harvie Road. This will be confirmed during the future Phase 3 and 4 Class EA Study.

#### 4.1.9.7 Cable TV

Cable TV conflicts will be identified and resolved during the detail design phase of the project.

#### 4.1.10 Impact on Vehicle Parking

Harvie Road is currently gated at the east extent of the Harvie Water Reservoir therefore limiting access to available parking between this point and Highway 400. Existing commercial development on Bryne Drive north of Caplan Drive and south of Essa Road provide adequate off street parking.

#### 4.1.11 Fisheries and Aquatic Habitat in Whiskey Creek

Whiskey Creek (south of Harvie Road) is a cold water fishery. Alternative 2 crosses Whiskey Creek at a location downstream of the stormwater management pond.

Alternatives 3, 4, 5, and 3R cross the Creek at the east end of the stormwater management pond (either over the berm or over the pond itself).

A description of the Creek is provided in the 2005 Bryne Drive MP.

#### 4.1.12 Fisheries and Aquatic Habitat in Whiskey Creek Tributary

There is a minor tributary to Whiskey Creek located on the north side of Harvie Road. Alternatives 3, 4, 5 and 3R would be required to cross this tributary, which is considered to be a cold water fishery.



4.1.13 Fisheries and Aquatic Habitat in Lover’s Creek Tributary

Alternative 2 would cross the Lover's Creek tributary at close to a 90° angle, thus reducing the environmental impact. Alternatives 3, 4, 5, and 3R would require a rerouting of the creek to affect a reasonable crossing. As such, the environmental impact is considered to be greater.

4.1.14 Wildlife Habitat

Most of the study area consists of natural heritage features such as; wetlands, cultural meadows, cultural thickets and deciduous and coniferous forests, with wildlife species that are habituated to human activity. Please see the 2005 Bryne Drive MP for additional information.

4.1.15 Vegetation

Much of the vegetation in the study area is of anthropogenic origin, resulting from past agricultural uses and present residential and commercial uses. Please see the 2005 Bryne Drive MP for additional information.

Cathy V. Bentley Forestry Consulting conducted an additional inspection and evaluation of existing trees in the area in order to prepare a Tree Report (August 29, 2008) outlining findings and recommendations for the proposed work. A copy of the Report is included in Appendix “D.” Although the Report did not assess Alignment Alternative 3R, it is noted that Alignment 3R (for that portion that is north of Harvie Road) is between Alignments 3 and 5 and therefore, the anticipated number and type of trees that would be removed can be estimated. A summary of actual identified trees along Alignment Alternatives 3R and 5 and an estimate of the trees along Alternative 3R is provided in the following Table.

TABLE 1 – Alternative 3R Tree Assessment

<b>Alternative 3 - Actual</b>	<b>Alternative 5 - Actual</b>	<b>Alternative 3R - Estimated</b>
6 White Pine	No White Pine	3 White Pine
7 Eastern White Cedar	4 Eastern White Cedar	6 Eastern White Cedar
1 Red Oak	1 Red Oak	1 Red Oak
1 Basswood	No Basswood	1 Basswood
1 Black Cherry	3 Black Cherry	2 Black Cherry
No Trembling Aspen	2 Trembling Aspen	1 Trembling Aspen
No Yellow Birch	1 Yellow Birch	1 Yellow Birch

It is suggested that the impact to trees along Alignment 3R would be slightly worse than along Alignment 5 but less than the impact along Alignment 3.

C. Bentley recommends the following with respect to Alignment 3. These recommendations apply to Alternative Alignment 3R.

- Trees that are healthy (39 in fair condition), and of significant size, be considered for preservation or protection where possible; and
- Recommends removal of trees that are in poor condition (21) – no replacement value.

It should be noted that much of the study area is slated for commercial / industrial development so preservation of existing trees would be further considered as part of development approval.

#### 4.1.16 Soils

Surface soils in the study area are characterized by sandy loam (Bs, DS) or loamy sand (Tis, Tis-Vasl). Please see the 2005 Bryne Drive MP for additional information. However, in order to confirm the structural feasibility of crossing the Whiskey Creek SWM berm, Peto MacCallum completed a Geotechnical Assessment. A copy of the report is included in Appendix “E”. It was determined that it is structurally feasible to construct the road on top of the existing berm by widening the berm, extending the culvert and revising the inlet and outlet structures as necessary. A summary of the geotechnical considerations for the berm widening are as follows:

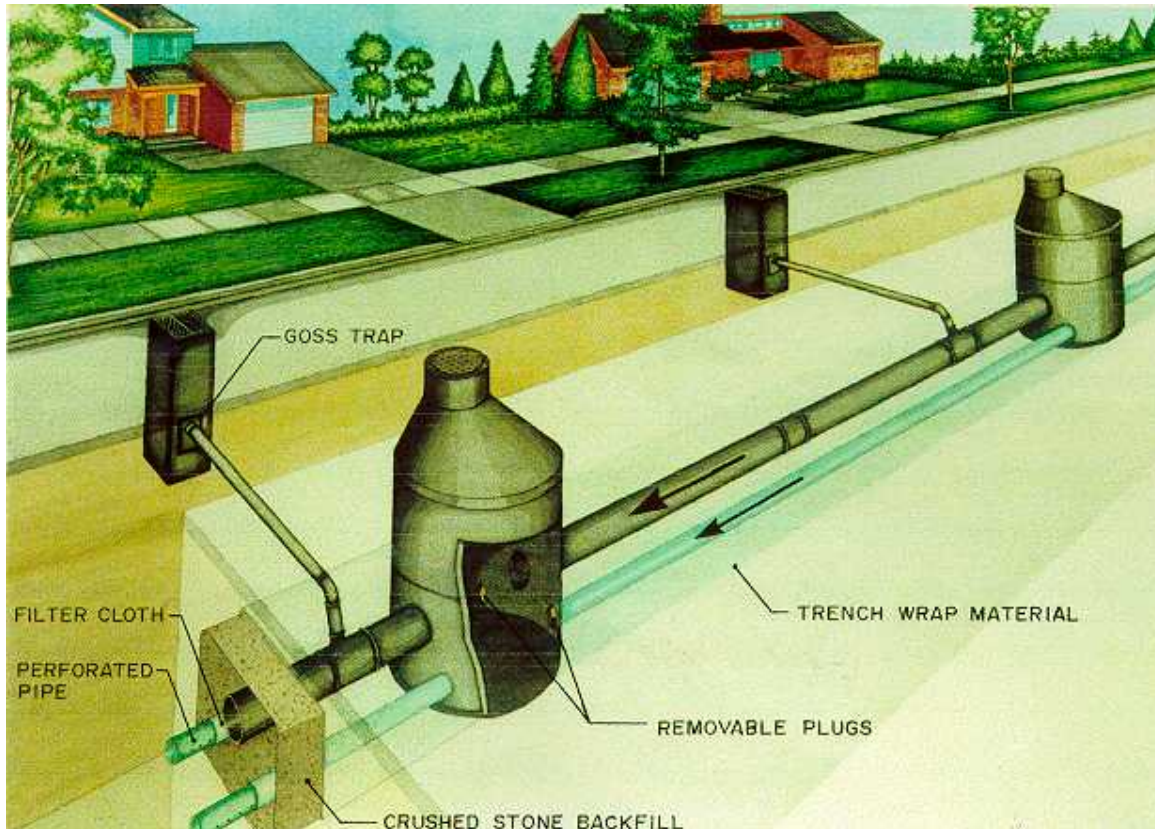
- Based on test N values the existing berm fill is in a compact condition (N – is the number of blows required to advance a standard split spoon sampler 0.3m into the subsoil. The driving energy being 475 J per blow);
- Widening of the berm to support the road is feasible provided that certain measures are taken during construction including erosion control;
- Side slopes of the new embankment should be protected from surface erosion by sodding or by seed and mulch as soon as possible following construction; and
- Engineered fill should be provided as outlined in the Geotechnical Report.

Soils in the study area have relatively high infiltration rates and would be conducive to infiltrating clean stormwater runoff into the ground through the use of Low Impact Development (LID) facilities.

Low Impact Development (LID) is an innovative stormwater management approach with a basic principle that is modeled after nature: manage rainfall at the source using uniformly distributed decentralized micro-scale controls. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. Techniques are based on the premise that stormwater management should not be seen as stormwater disposal. Instead of conveying and managing / treating stormwater in large, costly end-of-pipe facilities located at the bottom of drainage areas, LID addresses stormwater through cost-effective 'at the source' facilities. One such LID for new urban road designs is the Etobicoke Exfiltration System (EES). The EES was conceived to reproduce the infiltration and groundwater recharge of rainfall prior to urbanization. The EES consisted of two 200 mm perforated PVC pipes installed below the storm sewer as the road is reconstructed (see Figure 4). Both the perforated pipes and the storm sewer are encased in a conventional granular stone trench. The perforated pipes connect to both the upstream and downstream manholes. At the downstream manhole, mechanical plugs are installed at the exfiltration pipes. Thus, the exfiltration pipes are storage systems instead of conveyance systems. During a storm event, storm runoff from the upstream manhole enters the two perforated pipes and exfiltrates firstly to the stone trench and subsequently to the surrounding soil. In order to prevent the perforated pipes and stone trench from clogging, sediment intrusion or loss of granular materials, both the perforated pipes and the stone trench are wrapped with a filter fabric. For large storm events, the runoff may exceed the exfiltration volume and the storage capacity of perforated pipes and stone trench and results in an overflow to the storm sewer at the upstream manhole.

LID measures, including the potential use of EES, shall be investigated further during Phases 3 and 4 of the Class EA study.

**Figure 4 - Etobicoke Exfiltration System**



4.1.17 Groundwater Resources and Source Water Protection Area

The study area is located within a Hydrogeologic Environmentally Sensitive Area (ESA) based on the recharge/discharge function of the local soils and geology. Please see the 2005 Bryne Drive MP for additional information. The open portions of Bryne Drive south of Essa road lies within a source water protection area.

4.1.18 Water Quality/Stormwater Management, Whiskey Creek

The Whiskey Creek stormwater management pond (known as Pond A) is described in the 2005 Bryne Drive MP. It was noted in the 2005 Bryne Drive MP that Alternative 2 would not affect Pond A. However, Alternatives 3, 4, 5 and 3R will need to be designed such that there is no loss to the storage capacity of the pond. The SWM pond has been designed to handle the Regional Storm with the top of berm elevation matching the Regional Flood elevation. There is a 50 m long lowered section at the east end of the SWM pond berm that is 0.6 m below the Regional Flood elevation. This lowered section provides an emergency overflow spill in the event that the flood exceeds the Regional Storm event or if the outlet structure is blocked. It is recommended that the existing overflow spillway be retained as part of any future crossing of

the berm by Bryne Drive. This can be achieved by either bridging over the berm or by installing sufficiently sized culverts under the new roadway to provide the necessary spillway capacity to exceed the Regional Storm flow. In order to design for the 100 year storm event (more severe than the Regional Storm), the profile of the new road (or bridge) would need to be set 1.0 m higher than the Regional Storm elevation.

Options to mitigate impacts to the existing SWM pond, including the emergency overflow spill way and establishing the new road profile having regard for the 100 year storm event will be addressed during Phase 3 and 4 of the Class EA study.

#### 4.1.19 Water Quality/Stormwater Management, Caplan Avenue Pond

The Caplan Avenue Pond (known as pond LV14) is a stormwater management pond that provides storage prior to discharge to the Lover's Creek tributary. Although Alternatives 3, 4, 5 and 3R are in close proximity to this pond, it is considered that there will be no loss of storage associated with the development of any of these Alignment Alternatives. It is noted that a retrofit of Pond LV14 was recently completed.

It is noted that in order to provide stormwater drainage in the area adjacent to pond LV14 and to prevent the new roadway from blocking the flow of stormwater to the pond, the new road will have to be designed to allow flow to be directed to the SWM pond.

As part of the approval of the Princess Auto development and construction of the pond LV14 retrofit the City acquired property for the potential realignment of Bryne south of the Smart Centres lands immediately east of Princess Auto.

## 4.2 Social Environment

### 4.2.1 Existing Building and Property

The existing commercial/industrial buildings and developed properties along the study alignment are currently negatively affected by traffic congestion at Maplevue Drive and Essa Road.

### 4.2.2 Noise

In addition to the comment provided with respect to noise in the 2005 Bryne Drive MP, a Noise Impact Review (August, 2008) was undertaken by J.E Coulter Associates Limited for the City of Barrie. A copy of the Report is included in Appendix "F". The report concluded that due to the significant background noise generated by traffic on Highway 400, none of the identified Alignment Alternatives would result in an increase in noise levels. A summary of the findings are provided as follows:

- Noise calculations are based on existing road volumes projected 10 years after the anticipated 2010 completion date to the year 2020, based on a growth factor of 4%;
- Noise from Hwy 400 is expected to dominate at the receptors potentially affected by the Bryne Drive extension;
- Alignment 4 is the only Alternative that causes a detectable impact upon sensitive

receptors;

- Alignments 2, 3 and 5 would generate increases that for most people are below the threshold of reliable detection upon sensitive receptors – range from 0dB to 2dB; and
- All Alignments are well below the threshold for which noise mitigation might be considered – 5dB.

The 2005 Highway 400 TESR / PDR is currently being updated by MTO. The 2005 report identifies that the future widening of Highway 400 to 8/10 lanes would be accommodated by shifting the existing centerline of Highway 400 to the west but this recommendation is being reassess as part of the Highway 400 TESR Update. The Highway 400 alignment shift, additional lanes and increased traffic volumes would further increase noise on the west side of Highway 400.

#### 4.2.3 Sidewalk and Bicycle Paths

The MMATMP approved by Council in 2013 identified bike lanes and sidewalks on Bryne Drive within the study area. These sidewalks and bike lane recommendations will be further considered as part of Phase 3 & 4 of this Class EA.

#### 4.2.4 Aesthetics

The existing boulevard along the opened portions of the study area, are finished with sod and some trees. The opportunity will exist, as part of any road widening, to further enhance the existing landscaping in the boulevard. Phase 3 & 4 of the Class EA for Bryne Drive will consider boulevard enhancements.

Future commercial, which is expected to develop along unopened portions of Bryne Drive and Commerce Park Drive, would be required to construct landscape buffers.

#### 4.2.5 Access to Existing Properties

Access to existing properties will be maintained during construction. It is anticipated that driveways can be satisfactorily re-graded as part of any proposed road widening. Driveway changes will be reviewed in greater detail during Phase 3 & 4 of the Class EA process.

### 4.3 Cultural Environment

#### 4.3.1 Archaeological/Heritage Resources

A Stage 1 Archaeological Assessment was undertaken in the 2005 Bryne Drive MP. The report concluded that there is a high potential for archaeological significance in the study area.

The Harvie Road / Big Bay Point Road / Highway 400 Transportation Improvements (Bryne Drive to Bayview Drive) Phase 3 & 4 Municipal Class EA included additional details on potential archaeological resources both north and south of Harvie Road which will be further investigated as part of phase 3 & 4 of the Class EA through the completion of a Stage 2 and possibly a Stage 3 and 4 archaeological study.

#### 4.4 Economic Environment

##### 4.4.1 Impact on Business

Business Owners in the south end of Barrie have indicated that the existing traffic congestion is negatively impacting their business. Any improvement in traffic capacity would reduce delay from traffic congestion and have a positive impact on business.

##### 4.4.2 Budget Considerations

The City plans to advance the construction of the Harvie Road / Big Bay Point Road / Highway 400 Overpass which is currently scheduled to be completed in 2021. To minimize impact on existing residential areas and to allow the new Highway 400 crossing to function effectively as a mechanism to reduce traffic congestion on Mapleview Drive and Essa Road, Bryne Drive is required between Caplan Avenue and Essa Road before 2021.

The 2016 capital plan currently provides for the following budget for the completion of the Bryne Drive extension.

**Table 10 - City of Barrie 2016-2020 Capital Plan – Bryne Drive Extension**

	2017 (\$000)	2018 (\$000)	2019 (\$000)	2020 (\$000)	2021 (\$000)	Total (\$000)
<b>Harvie to North of Caplan</b>	\$443	\$321	\$886	\$2,214	\$2,179	\$6,078
<b>Harvie to South of Essa</b>	\$436	\$733	\$872	\$2,179	\$2,179	\$6,399
<b>Total (\$000)</b>	\$879	\$1,054	\$1,758	\$4,393	\$4,393	\$12,477

Note: budget estimates include engineering, contract administration, utility relocations, property acquisition relating to only the widening of the existing portions of Bryne Drive (i.e. no property costs associated with the extension of Bryne Drive through green fields immediately north and south of Harvie Road are included in these budget estimates) and construction costs.

##### 4.4.3 Infrastructure Maintenance Costs

Maintenance costs will increase with the construction of any new roads. Typically, they include such items as:

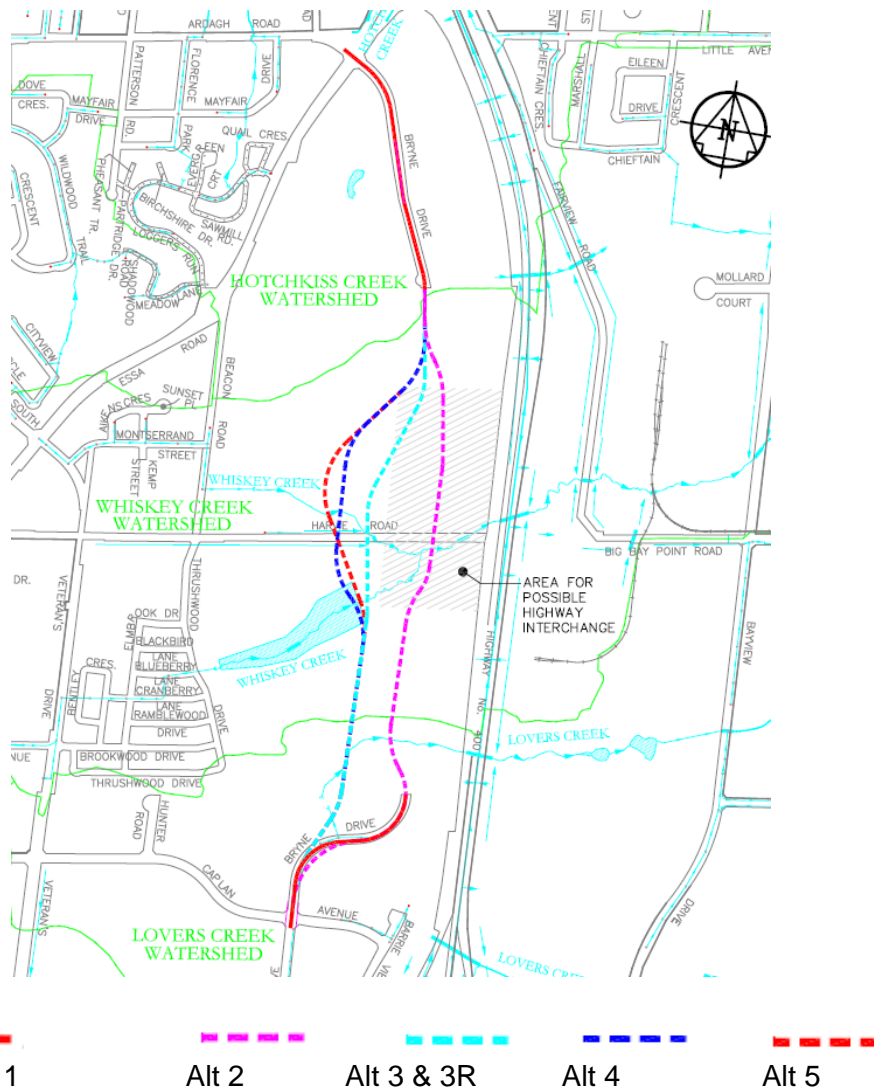
- Pavement surface repairs (i.e. route and seal of cracks, pothole repair, etc.)
- Repair/replacement of damaged curb and sidewalk
- Routine cleanout of catch basins and storm sewer maintenance holes
- Regular inspection and periodic repair of bridge and culvert structures
- Rehabilitation of outlet ditches, including removal of sediment and debris
- Replacement of ground mounted signs
- Grass cutting and weed control within boulevards and other soft landscape features
- Pruning of boulevard trees and replacement if necessary due to disease or poor health

Costs associated with routine maintenance are planned for during the City's annual budgeting process. Operating costs will be further assessed in Phase 3 & 4 of EA.

## 5.0 SCREENING OF ALTERNATIVE SOLUTIONS

The alternatives are to be screened with respect to their impact on the *physical, social, cultural* and *economic* environments. For each of the above criteria, sub-factors were established, which are presented following tables for each alternative. The assessment process compares various alternatives to the undertaking in a comprehensive manner by ensuring that the conclusions and recommendations are reached in a clear and logical fashion, and that all environmental issues sensitive to each undertaking are given thorough consideration. This assessment has been based on the work undertaken to-date and available information completed as part of other studies. The various alternative alignments are shown in Figure 5 and discussed in greater detail in the following sections.

**Figure 5 - Alternative Alignments**



### 5.1 **Alternative 1 - Do Nothing, Direct Future Traffic Onto Surrounding Streets**

The Do Nothing Alternative was assessed as part of the 2005 Bryne MP. Section 5.2.1 of the 2005 Bryne MP provides commentary on the original assessment. As noted previously and as concluded in the original Class EA, the “Do Nothing” Alternative does not resolve the problem. Although it may have less impact on the environment within the green field area, the resulting negative impacts on the existing streets outweigh any benefits.

Table 2 – Alternative 1 – “Do Nothing” summarizes the effects on the environment for Alternative 1.

### 5.2 **Alternative 2 - Preferred Alternative from the 2005 Bryne Drive MP**

Alternative 2 was assessed as part of the 2005 Bryne MP. Section 5.1.5 of the 2005 Bryne MP provides a commentary on the original assessment.

Since December 2005, additional assessment has been undertaken to determine acceptable distance from a future off ramp from Highway 400 to a proposed Bryne Dr./Harvie Road intersection. As such, the originally proposed alignment is too close to Highway 400. Please see traffic report in Appendix G for additional information.

Table 3 - “Alternative 2 – Previously Preferred Alternative” summarizes the effects on the environment for Alternative 2. Alternative 2 would mitigate the traffic congestion problems at the Mapleview and Essa interchanges but it does not meet the setback requirement for a possible future Highway 400 interchange. The road profile for this alternative is also incompatible with the recommended road profile for the highway crossing over Highway 400. It would also be challenging to implement a Bryne Drive road profile which is compatible with the Council approved Harvie Road / Big Bay Point Road / Highway 400 crossing over Highway 400 and would negatively impact development opportunity on adjacent lands.

### 5.3 **Alternative 3 - Central Alignment**

Alternative 3 has less impact on the environment than Alternative 2. By crossing Whiskey Creek at the existing berm, the impact to the Creek is reduced. In addition, there is no impact to the CTV Tower. A Traffic Analysis was undertaken using the Synchro model with background model data supplied by the City through an EMME 3 model. The analysis indicated that a crossing of Harvie Road at the Alternative 3 location is feasible and would not negatively impact a future interchange. MTO reviewed the analysis and concurred with the conclusion (see MTO email dated June 25/09). Copies of the Traffic Analysis Report and the MTO email and responses are included in Appendix “G.”

Table 4 – “Alternative 3 and 3R – Central Alignment” summarizes the effects on the environment for Alternatives 3.

### 5.4 **Alternative 3R – Modified Central Alignment**

The environmental impacts of this Alternative are the same as the impacts identified for Alternative 3.



Table 4 also summarizes the effects on the environment for Alternative 3R.

#### 5.5 **Alternative 4 – Western Alignment – 90° Crossing of Harvie Road**

This Alternative resolves the issue of traffic congestion within the Study Area, however, it would impact the existing stormwater management pond on Whiskey Creek by reducing the available storage volume. This alternative increases the separation between Bryne Drive and the future interchange ramp over Alternative 3 & 3R.

Table 5 – “Alternative 4 – Western Alignment – 90° Crossing of Harvie Road” summarizes the effects on the environment for Alternative 4.

#### 5.6 **Alternative 5 – Western Alignment – Angled Crossing of Harvie Road**

Alignment Alternative 5 is similar to Alternative 4 with respect to environmental impacts except that it minimizes impact with the existing stormwater management pond on Whiskey Creek by crossing Harvie Road at an angle. This alternative increases the separation between Bryne Drive and the future interchange ramp over Alternative 3 & 3R and is similar to Alternative 4.

Table 6 – “Alternative 5 – Western Alignment – Angled Crossing of Harvie Road” summarizes the effects on the environment for Alternative 5.

**TABLE 2 -Alternative 1 – “Do-Nothing”**

Area of Potential Environmental Effect	No Effect		Potential Effect (Significance Unknown)		Significant Effect		Comments
	On Site <sup>1</sup>	Off Site <sup>2</sup>	On Site <sup>1</sup>	Off Site <sup>2</sup>	On Site <sup>1</sup>	Off Site <sup>2</sup>	
<b>Physical Environment</b>							
Accommodation of Existing and Future Traffic Demand					-ve	-ve	Does not resolve existing and future transportation problems in south Barrie
Compatibility With Existing and Future Road Network					-ve	-ve	Does not accommodate potential future highway interchange or existing transportation needs
Emergency Services			-ve	-ve			No improved service
Transit Service			-ve	-ve			No improved service
Safety			-ve	-ve			Traffic incidents related to congestion will increase over time
Impact on Road Capacity During Construction	X	X					
Major Services / Utility Conflicts	X	X					
Fisheries & Aquatic Habitat	X	X					
Wildlife Habitat	X	X					
Vegetation	X	X					
Groundwater Resources	X	X					
Water Quality / Stormwater Management	X	X					
<b>Social Environment</b>							
Existing Buildings	X	X					
Existing Properties	X	X					
Noise	X	X					
Pedestrian/Cyclist Facilities			-ve	-ve			No new sidewalks and roads for cyclists
Aesthetics	X	X					
Access to existing properties					-ve	-ve	Traffic congestion will limit access to industrial and commercial properties
<b>Cultural Environment</b>							
Archaeological / Heritage Resources	X	X					
<b>Economic Environment</b>							
Impact on Business					-ve	-ve	Traffic congestion currently effects area businesses
Impact on Infrastructure Maintenance Costs	X	X					Infrastructure relatively new.
Impact on Property Acquisition Costs	X	X					
Impact on Construction Costs	X	X					

<sup>1</sup> On-Site refers to the study area    <sup>2</sup> Off-Site refers to lands outside of the study area  
 -ve = negative effect    +ve = positive effect    X = neither positive or negative effect

**TABLE 3 - Alternative 2 – Previously Preferred Alternative**

Area of Potential Environmental Effect	No Effect		Potential Effect (Significance Unknown)		Significant Effect		Comments
	On Site <sup>1</sup>	Off Site <sup>2</sup>	On Site <sup>1</sup>	Off Site <sup>2</sup>	On Site <sup>1</sup>	Off Site <sup>2</sup>	
<b>Physical Environment</b>							
Accommodation of Existing and Future Traffic Demand			-ve	-ve			Does not accommodate potential future Hwy interchange
Compatibility With Existing and Future Road Network			-ve	-ve			Does not accommodate potential future Hwy interchange
Emergency Services			+ve	+ve			Improved service
Transit Service					+ve	+ve	Improved service
Safety					+ve	+ve	Less traffic congestion will result in fewer accidents
Impact on Road Capacity During Construction			-ve	-ve			Temporary minor traffic disruptions
Major Services / Utility Conflicts			-ve	-ve			Existing utilities along Harvie Road will need to be crossed (hydro, sanitary sewer and watermain).
Impact on Vehicle Parking	X	X					
Fisheries & Aquatic Habitat			-ve	-ve			More thermal pollution. Additional Creek crossings.
Wildlife Habitat			-ve	-ve			Wildlife habitat not of major significance because of urban nature of study area
Vegetation			-ve	-ve			Vegetation not of major significance because of urban nature of study area
Groundwater Resources			-ve	-ve			Groundwater resources are potentially affected
Water Quality / Stormwater Management			-ve	-ve			Additional run-off from roads
<b>Social Environment</b>							
Existing Buildings	X	X					No building demolition required
Existing Properties		X			-ve		Less development opportunity
Noise			-ve	-ve			Increased noise from increased traffic volumes
Pedestrian/Cyclist Facilities					+ve	+ve	New sidewalks
Aesthetics			+ve	+ve			Additional landscape opportunities in boulevards
Access to existing properties					+ve	+ve	Reduced traffic congestion would increase access
<b>Cultural Environment</b>							
Archaeological / Heritage Resources		X	-ve				Potential impact
<b>Economic Environment</b>							
Impact on Business					+ve	+ve	Improves area business. Some on-street parking lost
Impact on Infrastructure Maintenance Costs			-ve	-ve			Additional road and utilities to maintain
Impact on Property Acquisition Costs		X			-ve		Property may be acquired as part of site plan approval
Impact on Construction Costs		X	-ve				Least costly alignment

<sup>1</sup> On-Site refers to the study area    <sup>2</sup> Off-Site refers to lands outside of the study area  
 -ve = negative effect    +ve = positive effect    X = neither positive or negative effect

**TABLE 4 - Alternative 3 and 3 R– Central Alignment**

Area of Potential Environmental Effect	No Effect		Potential Effect, (Significance Unknown)		Significant Effect		Comment
	On Site <sup>1</sup>	Off Site <sup>2</sup>	On Site <sup>1</sup>	Off Site <sup>2</sup>	On Site <sup>1</sup>	Off Site <sup>2</sup>	
<b>Physical Environment</b>							
Accommodation of Existing and Future Traffic Demand					+ve	+ve	Meets existing and future transportation needs
Compatibility With Existing and Future Road Network					+ve	+ve	Does accommodate potential future highway interchange
Emergency Services					+ve	+ve	Improved service
Transit Service					+ve	+ve	Improved service
Safety					+ve	+ve	Less traffic congestion will result in fewer accidents
Impact on Road Capacity During Construction			-ve	-ve			Temporary minor traffic disruptions
Major Services / Utility Conflicts			-ve	-ve			Existing utilities along Harvie Road will need to be crossed (hydro, sanitary sewer and watermain).
Impact on Vehicle Parking	X	X					
Fisheries and Aquatic Habitat			-ve	-ve			More thermal pollution.
Wildlife Habitat			-ve	-ve			Wildlife habitat not of major significance because of urban nature of study area
Vegetation			-ve	-ve			Vegetation not of major significance because of urban nature of study area
Groundwater Resources			-ve	-ve			Groundwater resources are potentially effected
Water Quality / Stormwater Management			-ve	-ve			Additional run-off from roads. Impact to stormwater ponds north of Caplan Avenue and at Whiskey Creek outlet
<b>Social Environment</b>							
Existing Buildings		X			-ve		No residential building demolition but alignment may conflict with existing satellite dish
Existing Properties		X	-ve				Some additional property required
Noise			-ve	-ve			Increased noise from increased traffic volumes
Pedestrian / Cyclist Facilities					+ve	+ve	New sidewalks
Aesthetics			+ve	+ve			Additional landscape opportunities in boulevards
Access to existing properties					+ve	+ve	Reduced traffic congestion would increase access
<b>Cultural Environment</b>							
Archaeological / Heritage Resources		X			-ve		Need for additional assessment prior to final design
<b>Economic Environment</b>							
Impact on Business					+ve	+ve	Improves area business
Impact on Infrastructure Maintenance Costs			-ve	-ve			Additional road and utilities to maintain
Impact on Property Acquisition Costs		X			-ve		Additional property required along proposed alignment
Impact on Construction Costs		X			-ve		Crossing of existing berm

-ve = negative effect

+ve = positive effect

X = neither positive or negative effect

**TABLE 5 - Alternative 4 – Western Alignment – 90° Crossing of Harvie Road**

Area of Potential Environmental Effect	No Effect		Potential Effect (Significance Unknown)		Significant Effect		Comments
	On Site <sup>1</sup>	Off Site <sup>2</sup>	On Site <sup>1</sup>	Off Site <sup>2</sup>	On Site <sup>1</sup>	Off Site <sup>2</sup>	
<b>Physical Environment</b>							
Accommodation of Existing and Future Traffic Demand					+ve	+ve	Meets existing and future transportation needs
Compatibility With Existing and Future Road Network					+ve	+ve	Accommodates new highway
Emergency Services					+ve	+ve	Improved services
Transit Service					+ve	+ve	Improves services
Safety					+ve	+ve	Less traffic congestion will result in fewer accidents
Impact on Road Capacity During Construction			-ve	-ve			Temporary minor traffic disruptions
Major Services / Utility Conflicts			-ve	-ve			Existing utilities along Harvie Road will need to be crossed (hydro, sanitary sewer and watermain).
Impact on Vehicle Parking	X	X					
Fisheries & Aquatic Habitat					-ve	-ve	More thermal pollution. Additional Creek crossings
Wildlife Habitat					-ve	-ve	Wildlife habitat not of major significance because of urban nature of study area
Vegetation					-ve	-ve	Vegetation not of major significance because of urban nature of study area
Groundwater Resources			-ve	-ve			Groundwater resources are potentially effected
Water Quality / Stormwater Management					-ve	-ve	Additional run-off from roads. Impact to stormwater ponds north of Caplan Avenue and at Whiskey Creek outlet
<b>Social Environment</b>							
Existing Buildings	X	X					No building demolition required
Existing Properties		X	-ve				Some additional property required
Noise			-ve	-ve			Increased noise from increased traffic volumes
Pedestrian/Cyclist Facilities					+ve	+ve	New sidewalks
Aesthetics			+ve	+ve			Additional landscape opportunities in boulevards
Access to existing properties					+ve	+ve	Reduced traffic congestion would increase access
<b>Cultural Environment</b>							
Archaeological / Heritage Resources		X			-ve		Need for additional assessment prior to final design
<b>Economic Environment</b>							
Impact on Business					+ve	+ve	Improves area business
Impact on Infrastructure Maintenance Costs			-ve	-ve			Additional road and utilities to maintain including major bridge over SWM pond
Impact on Property Acquisition Costs		X			-ve		Additional property required along proposed alignment
Impact on Construction Costs		X			-ve		Extra cost for bridging at stormwater pond

<sup>1</sup> On-Site refers to the study area    <sup>2</sup> Off-Site refers to lands outside of the study area  
 -ve = negative effect    +ve = positive effect    X = neither positive or negative effect

**TABLE 6 - Alternative 5– Western Alignment – Angled Crossing of Harvie Road**

Area of Potential Environmental Effect	No Effect		Potential Effect (Significance Unknown)		Significant Effect		Comments
	On Site <sup>1</sup>	Off Site <sup>2</sup>	On Site <sup>1</sup>	Off Site <sup>2</sup>	On Site <sup>1</sup>	Off Site <sup>2</sup>	
<b>Physical Environment</b>							
Accommodation of Existing and Future Traffic Demand					+ve	+ve	Meets existing and future transportation needs
Compatibility With Existing and Future Road Network					+ve	+ve	Accommodates new highway interchange
Emergency Services					+ve	+ve	Improved service
Transit Service					+ve	+ve	Improved service
Safety					+ve	+ve	Less traffic congestion will result in fewer accidents
Impact on Road Capacity During Construction			-ve	-ve			Temporary minor traffic disruptions
Major Services / Utility Conflicts			-ve	-ve			Existing utilities along Harvie Road will need to be crossed (hydro, sanitary sewer and watermain).
Impact on Vehicle Parking	X	X					
Fisheries & Aquatic Habitat					-ve	-ve	More thermal pollution. Additional Creek crossings
Wildlife Habitat					-ve	-ve	Wildlife habitat not of major significance because of urban nature of study area
Vegetation					-ve	-ve	Vegetation not of major significance because of urban nature of study area
Groundwater Resources			-ve	-ve			Groundwater resources are potentially effected
Water Quality / Stormwater Management					-ve	-ve	Additional run-off from roads. Impact to stormwater ponds north of Caplan Avenue and at Whiskey Creek outlet
<b>Social Environment</b>							
Existing Buildings	X	X					No building demolition required
Existing Properties		X	-ve				Some additional property required
Noise			-ve	-ve			Increased noise from increased traffic volumes
Pedestrian/Cyclist Facilities					+ve	+ve	New sidewalks
Aesthetics			+ve	+ve			Additional landscape opportunities in boulevards
Access to existing properties					+ve	+ve	Reduced traffic congestion would increase access
<b>Cultural Environment</b>							
Archaeological / Heritage Resources		X			-ve		Need for additional assessment prior to final design
<b>Economic Environment</b>							
Impact on Business					+ve	+ve	Improves area business
Impact on Infrastructure Maintenance Costs			-ve	-ve			Additional road and utilities to maintain including major bridge over SWM pond
Impact on Property Acquisition Costs		X			-ve		Additional property required along proposed alignment
Impact on Construction Costs		X			-ve		May have extra cost for bridging at stormwater pond

<sup>1</sup> On-Site refers to the study area    <sup>2</sup> Off-Site refers to lands outside of the study area  
-ve = negative effect    +ve = positive effect    X = neither positive or negative effect

## 5.7 Traffic Analysis

The traffic analysis is intended to review the operation and queues associated with the future signalized intersections. MTO has indicated that a distance of 365 m would be acceptable for intersection spacing measured from the Highway 400 ramp terminal to the new intersection. MTO would consider a reduced spacing if it can be supported with justification for the reduced spacing (i.e. environmental restrictions, etc.) and traffic analysis to confirm that the reduced spacing does not create operational problems at a new interchange.

The traffic analysis was updated in September 2012 by Ainley & Associates using Synchro/Simtraffic to assess the traffic operations and queue analysis associated with Alternative 3. The traffic analysis concluded that there will be no queues spillback onto Highway 400 at both Highway 400 off-ramp and can be reviewed in Appendix G

## 5.8 Property Acquisition Cost Estimates

Property acquisition costs were determined for the various roadway width alternatives as part of the original Class EA (see Clause 5.1.6 of the original report). An updated estimate of the property acquisition costs associated with the various Alignment Alternatives is presented below and is based on information provided by the City in an email dated November 25, 2009, copy included in Appendix “H” (\$200,000 per acre for raw land and \$376/m<sup>2</sup> for any ROW widening – includes costs for landscape change, sign relocation etc.). This equal to a cost of \$494,000 per Ha.

TABLE 7 – Estimated Property Acquisition Costs

	<b>Alt 2</b>	<b>Alt 3</b>	<b>Alt 3R</b>	<b>Alt 4</b>	<b>Alt 5</b>
<b>Road Length (m)</b>	1800	1806	1806	1814	1839
<b>Average ROW Width (m)</b>	36	36	36	36	36
<b>Ha</b>	6.48	6.50	6.50	6.53	6.62
<b>Cost Per Ha</b>	\$494,000	\$494,000	\$494,000	\$494,000	\$494,000
<b>Total Cost</b>	\$3.20 M	\$3.21 M	\$3.21 M	\$3.23 M	\$3.27 M

Note: property areas are approximate and will require finalization during detailed design. An average road allowance width of 36 m was assumed for EA purposes.

Please note that property costs may not be incurred if land is acquired as part of a development application.

## 5.9 **Construction Cost Estimates**

The City of Barrie has recently updated the unit prices and the City's revised average cost for a new, 18 m width of asphalt within a 36 m wide ROW in 2015 dollars is \$3,000/m (copy of City's spreadsheets is included in Appendix I). Preliminary construction cost estimates for the five road alignment alternatives, including allowances for crossing culvert structures at Lovers Creek and Whiskey Creek, contingencies (of 30%) and engineering (of 15%), but excluding property costs, utility relocation costs, and taxes are listed below:

Alternative 2 - \$8.96 M

Alternatives 3 & 3R - \$12.47 M

Alternative 4 - \$13.75 M

Alternative 5 - \$14.62 M

A Copy of the Alternative Comparative Costs Table 8 is provided in Appendix "J".

## 5.10 **Public Consultation**

### 5.10.1 **Notice of Study Commencement**

A Notice of Study Commencement was prepared and published for the Master Plan Update. The Notice appeared in the July 11 and 12 2008 editions of the Barrie Advance. A copy of the Notice is included in Appendix "A". No comments were received as a result of the publication of the Notice of Study Commencement.

### 5.10.2 **Results of Public Consultation**

A Public Information Centre (PIC) was held on Thursday August 21, 2008. The City published a Notice of Public Information Centre on August 8 and 9, 2008. The City also advised Review Agencies of the PIC by letter complete with a copy of a Comment Sheet. In addition, the City prepared a letter dated August 7, 2008 and sent a copy to all area property owners, business owners and tenants including Havenwood Homes Limited. Copies of the Notice, letters, contact lists, the Comment Sheet, and a copy of the PIC drawing materials are included in Appendix "K".

Ten persons signed in at the PIC. A copy of the sign-in sheet is included in Appendix "K". Ainley and City of Barrie staff attended the PIC. A memo was prepared, listing the comments received during the PIC and the verbal responses provided to the comments. A copy of that memo dated August 21, 2008 is included in Appendix "K".



Copies of the comments along with summary sheets for both Agency and Public contacts are provided in Appendix “K”. A consolidated comment sheet is also included in Appendix “K”.

#### 5.10.2.1 Public Preference

Based on the comments received, the public and agencies preferred a realigned alternative that minimizes impact on the natural environment, existing residential areas and is compatible with future development.

Although the results are based on a very small number of comments, Alternatives #4 or 5 are the preferred Alternatives based on public opinion. The Lake Simcoe Region Conservation Authority subsequently (April 8, 2009) notified the City of its preference for Alternative Alignment #2.

#### 5.10.2.2 Areas of Concern

The following concerns were raised by members of the public and grouped by the alternative indicated:

##### Prefers Alt # 3

- Alternatives 3, 4 and 5 will bisect the block of land immediately south of Harvie Road and the property owner wants a larger parcel of land to the west. In that regard, the property owner prefers Alt # 3;
- Alt # 3 will have a lesser impact on the Whiskey Creek Stormwater Management (SWM) pond and downstream tributary;
- Questions structural adequacy of SWM pond berm;
- Alt # 3 could cross Harvie Rd to avoid the existing culvert and wetland;
- Satellite dishes could be relocated to accommodate Alt # 3 (estimated cost of \$150,000);
- Alt # 3 is a “far superior” alignment to Alt # 4 and 5;
- Requests study to determine need for a possible future Hwy 400 interchange and the type of interchange;
- States that there will be limited access points onto Harvie Rd and therefore the location of the crossing of Alt #3 over Harvie Rd. should not affect a possible future Hwy 400 interchange;
- Cost of Alt # 3 is less than both Alt #4 and Alt #5; and
- Wants compensation for land lost due to Bryne Dr. crossing his client’s land.

##### Prefers Alt #4 or 5

- Alt #4 is consistent with submissions of stakeholder meetings and plans by A Channel (CTV) and Barrie View Farms;
- Meets MTO criteria for separation from possible future interchange off ramp (365m); and

- Exact location of Bryne Dr. at property line with Smart Centres was established in meetings and drawing exchange with Smart Centres.

Prefers Alt # 3, 4 or 5

- Leave stub road for access to existing cul-de-sac near Home Depot, Barrie Harley Davidson;
- Front parking would need to be expanded if cul-de-sac is removed; and
- “Connection of north end of Bryne would be less confusing to customers on Hwy 400”.

#### 5.10.2.3 Responses to Comments

Response letters were sent to all members of the public who provided comment. Copies of the response letters are included in Appendix “K”.

A consolidated list of the public’s comments and concerns regarding each of the Alternatives, along with the consolidated responses to these concerns is provided in Appendix “K”. In addition, the City’s original Table 7 is included in Appendix “K” for reference purposes. The City’s Table 7 summarizes major items of issue from the June 27, 2005 Open House and provides responses to those issues.

### 5.11 Selection of Preferred Alignment Alternative

Based on rational evaluation, review of relevant criteria, and completion of a rank-score analysis of the five Alternatives by members of the project team, Alternative Alignment 3R was selected as the recommended alignment. Examples of criteria considered in the evaluation of a preferred alternative include: input gathered from interested parties, opportunity for cost savings, impact on physical, social, cultural and economic environments, and identification of environmental impacts, along with ability to implement corresponding mitigating measures.

Each potential impact was given a rank from “0 to 3”. A significant negative effect is “0”; a significant positive impact is “3”. Therefore, the Alternative with the larger value indicates a greater degree of positive potential effects. Scores were then calculated by multiplying the weighting by the rank. A copy of the ‘Evaluation Summary of Alignment Alternatives’ matrix is included in Appendix “B”. Please refer to the Preferred Alternative Solution Drawings 1 to 9 in Appendix “B”.

Alternative 3R was preferred primarily due to the fact that it offers benefits similar to those available in Alternative 3 (i.e. compatibility with all geometric requirements, potential for a possible future Highway 400 interchange, lesser negative social, environmental and cultural impacts,) while meeting the needs of the Developers. The differences between Alternatives 3 and 3R are summarized as follows:

- Alternative 3 (Drawing Alt 3) did not indicate a geometrically acceptable connection to existing Bryne Dr. north of Caplan Ave. Alternative 3R (Drawing

108073 – RC2) includes a junction with the portion of Bryne Dr. that ends at the cul-de-sac at Harley Davidson Outlet; and

- Alternative 3, north of Harvie Rd. (Drawing Alt 3) begins to curve east immediately after crossing Harvie Rd. where as Alternative 3R stays straight north for a longer length before curving east to match into the Alternative 3 Alignment (Drawings 108073 RC5, RC6 and RC 7).

In summary, Alternative 3R represents the preferred solution as it best addresses the Problem Statement in the following manner:

- I. Provides for the efficient movement of goods and services within the south end of Barrie, thereby providing a relief in traffic congestion on Mapleview Drive and Essa Road in an environmentally responsible manner;
- II. Best supports the proposed Harvie Road/Big Bay Point Road / Highway 400 interchange location and configuration having regard for intersection/interchange spacing and operational constraints;
- III. Accommodates future development of adjacent lands by balancing the impacts and potential restrictions to the severed land parcels;
- IV. Impacts to private property are comparable to the other alternative alignments;
- V. Provides good opportunity to mitigate impacts to environmentally sensitive features, including Lover’s Creek and Whiskey Creek watercourses;
- VI. Minimizes impacts to the existing SWM pond and communications tower; and
- VII. Capital costs are significantly less than Alts 4 & 5.

#### 5.12 **Mitigating Measures**

The next step in the project will involve the completion of Phases 3 and 4 of the Municipal Class Environmental Assessment. During Phase 3 alternative design concepts to implement the preferred alignment (i.e. Alternative 3R) will be developed. A detailed evaluation will be completed and a preferred design will be selected in consultation with approval agencies, stakeholders and the public. To support the acceptance of the preferred design, an environmental mitigation and commitment plan will be prepared and documented in the Phase 3 and 4 Environmental Study Report. This mitigation plan will be implemented by the City during the detailed design and construction phase of the project (i.e. Phase 5 of the Class EA).

#### 5.13 **Recommended Projects**

Clause 5.3.1 of the original Master Plan recommended a list of projects which may be completed independently. That list has been updated within this Master Plan update to reflect the construction of a new segment of Bryne Drive in front of Princess Auto north of Caplan Avenue. The updated project list is as follows:

- Bryne Drive reconstruction from Caplan Avenue and the new construction (extension) of Bryne Drive from the existing south terminus (north of Princess Auto) to Harvie Road; and
- Bryne Drive new construction from Harvie Road to Essa Road.

It is noted the extension of Bryne Drive is an integral component of the adjacent Harvie Road/Big Bay Point Road/Highway 400 crossing project and as such it will need to be constructed and operational prior to opening the new Highway 400 crossing to the public. Further details with regard to the proposed Highway 400 crossing and its connection to Bryne Drive can be obtained by referring to the Harvie Road / Big Bay Point Road / Hwy 400 Crossing Environmental Study Report (prepared by others).

#### 5.14 **Next Steps**

Concerns and preferences expressed by the stakeholders at the Public Information Centre and throughout the planning process have been documented and addressed in the Addendum # 1 Report to the December 2005 Document, Master Plan Update, Bryne Drive Alignment Selection (Caplan Avenue to Essa Road).

In the Master Plan Class EA Approach, the Proponent acknowledges that a series of interrelated projects will be planned together and that the design, implementation and construction of the projects may be completed independently. This Master Plan Addendum # 1 Document would therefore, become the basis for, and be used in support of, future investigations for the specific projects identified within it. The Recommended Projects are identified in Clause 5.13 above.

It is noted that the Master Plan process has met the requirements of Phases 1 and 2 of the Class EA planning process. However, due to the significance of the proposed work with respect to cost, the MEA Class EA Document classifies the proposed project as a Schedule C Activity – Construction of new roads or other linear paved facilities (e.g. HOV lanes) with a value greater than \$2.4 million. As such, additional planning must be undertaken before final design and construction can proceed. Further planning must be completed to satisfy Phase 3 and 4 of the Class EA planning process.

The Preferred Solution for Bryne Drive will be presented to the General Committee of Council for consideration at this time. If endorsed by Council, specific projects identified in this Addendum # 1 to the Master Plan Document can proceed to Phase 3 and 4 of the Class EA planning process. Although development related projects may be undertaken by the private sector through the Planning Act, the City intends to continue with the Class EA planning process for the Bryne Drive Project. Should the City elect to continue with the Class EA for the extension of Bryne Drive, this Master Plan Class EA Study will continue onto Phases 3 and 4 of the Class EA planning process for each individual project. This is described in a letter dated January 29, 2008 from Janet E. Amos who was retained by the City to provide comment on the Class EA planning process. A copy of this letter is included in Appendix L. Phases 3 and 4 of the Class EA planning process will undertake the following tasks with respect to each individual project:

- Develop alternative design concepts for the preferred solution;
- Evaluate the design alternatives and identify the preferred design alternative;

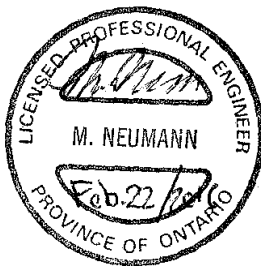
- Prepare a preliminary engineering design and implementation schedule for the preferred design alternative, including the recommendation of mitigating measures to address impacts and related concerns, and to assist in the development of alternative solutions; and
- Complete an Environmental Study Report (ESR) and issue a Notice of Completion.

Interested parties and review agencies will have the opportunity to provide comment and to assist in the development of the alternative design solutions, during Phases 3 and 4 of the Class EA planning process if the City and not the developer is the proponent of the proposed works. Those directly affected individuals and review agencies will be notified of the future Public Information Centre(s).

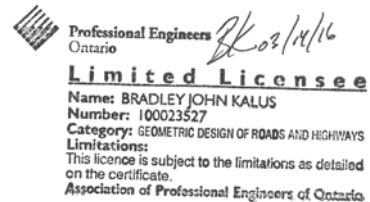
The following list of additional assessments/tasks will be completed as part of the Phase 3 & 4 Class EA for the Bryne Drive Project:

- a. Topographic survey and digital terrain model of the study limits;
- b. OLS Legal survey and verification of lot property fabric and existing road allowance;
- c. Preparation of property acquisition and legal reference plans;
- d. Preliminary geotechnical investigation, including assessment of soil and groundwater conditions and preparation of pavement design recommendations;
- e. Update of aerial base mapping for public presentation purposes;
- f. Complete a Stage 2 archaeological study and if necessary a Stage 3 and 4 archaeological study for all areas of potential disturbance within the project limits and where archaeological and/or cultural heritage artifacts are found;
- g. Assess if the proposed improvements can be phased having regard for the requirements needed to accommodate the Harvie Road/Big Bay Point Road/ Highway 400 crossing;
- h. Develop profile design options having regard for the 100 year and regional storm event;
- i. Confirm geometric design standards and prepare preliminary Design Criteria;
- j. Finalization of horizontal alignment, having regard for the existing SWM pond;
- k. Finalization of cross-section and grading limits;
- l. Review and assess driveway grading and transition requirements based on road design concepts;
- m. Review potential upgrading of the existing cul-de-sac as part of the Bryne Drive extension;
- n. Development of a preliminary landscape / tree planting plan and protection plan;
- o. Preparation of a detailed environmental impact and mitigation plan;
- p. Completion of cut/fill balance assessment;
- q. Finalization of road allowance and property/easement requirements;
- r. Completion of a stormwater management study, including assessment of LID measures, such as the Etobicoke Exfiltration System (EES);
- s. Assessment of crossing culvert requirements;
- t. Review and verification of existing utilities (including gas main on Harvie Road) and municipal services and identification of potential conflicts and relocation requirements to suit the design concepts;
- u. Assessment of impacts to existing SWM ponds and development of measures and design modifications to mitigate impacts to the pond, including the emergency overflow spill way;
- v. Coordination of road and intersection works with Harvie Road/Hwy 400 crossing design;

- w. PIC to present the various design alternatives and to solicit public and review agency comments on the recommended design;
- x. The MMATMP recommended bike lanes along the future Bryne Dr. roadway. The impact of providing bike lanes in the design will be assessed as part of Phases 3 & 4;
- y. Design roadway cross-sections will be developed further to show key elevations, culverts, sidewalks and spillways as required;
- z. Three watercourse crossings will be required at Hotchkiss, Whiskey and Lovers Creek. A stormwater management report will be required to address the culvert sizes;
- aa. A cross-section for a 5 lane roadway with bike lanes shall be assessed as part of the Phase 3 & 4 Class EA process. It is acknowledged that the adjacent lands will require raising ground elevations to match with the finalized vertical alignment of Bryne Drive which reduce the future roadway right of way;
- bb. The affected SWM pond volume will be determined along with the land area required for the road over the berm as part of the Phase 3 & 4 Study;
- cc. Additional details of the existing and proposed berm including top and bottom elevations, the 50m spillway, the existing and proposed culvert under the berm (sizes) and the creek (downstream and upstream headwalls) will be provided as part of the Phase 3 & 4 Study;
- dd. The method of crossing the wetland north of Harvie Road and of maintaining the flood plain storage will be assessed in Phase 3 and 4;
- ee. Intersection improvements and configuration shall be further assessed based on traffic analysis and storage calculations;
- ff. Assessment of annual operating costs.




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