The City of

BARRIE

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BRYNE DRIVE & COMMERCE PARK DRIVE MASTER PLAN

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT DOCUMENT

PHASES 1 & 2

(VETERAN'S DRIVE TO ESSA ROAD)

December 2005

BRYNE DRIVE & COMMERCE PARK DRIVE
MASTER PLAN
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1.0 BACKGROUND

1.1 **Introduction**

The City of Barrie is examining the need for roadway improvements along existing portions of Bryne Drive/Commerce Park Drive and the need for completing the connection of Bryne Drive/Commerce Park Drive from Veteran's Drive to Essa Road to accommodate existing and future traffic needs in South Barrie. In 1999, the City completed a Transportation Study identifying the need to increase north-south traffic capacity along Bryne Drive.

This study originally followed the guidelines for a Schedule "C" (Phase 1 and Phase 2) project contained in the Municipal Class Environmental Assessment (Class EA) Document dated June 2000. This Municipal Class EA Document is a planning procedure developed to ensure that the potential natural, social, cultural and economic environmental effects are considered in the planning and design of a project.

There are various interrelated project components associated with this Class EA which will be implemented separately, but must be planned together. Approach #1 of the Master Plan Process, as defined in the Class EA Document, will be undertaken. In the Master Plan 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 Document would therefore become the basis for, and be used in support of, future investigations for the specific projects identified within it.

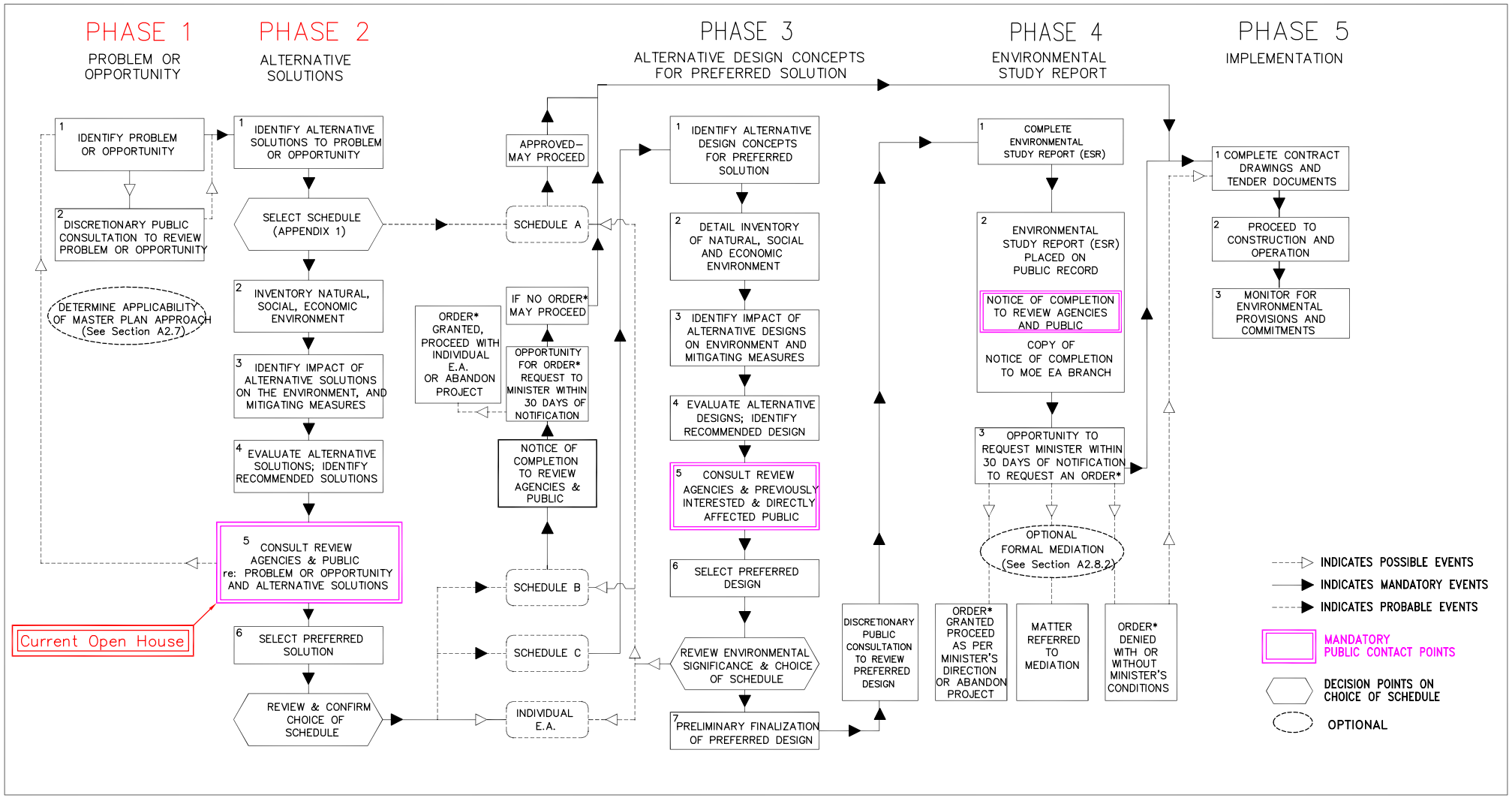
The proponent of a Master Plan are required to follow Phases 1 and 2 of the Class EA planning process involving mandatory contact with the directly affected public and with relevant government agencies to ensure that they are aware of the project and that their concerns are addressed. Please see Figure 1 for a flow chart summarizing the Class EA process.

1.2 **Project Team**

The project team that has compiled this Class EA Document consists of:

- R. Newlove, P. Eng., Director of Engineering
- W. McArthur, P. Eng., Manager of Design and Construction Services
- R. Forward, M.Sc., P. Eng., Manager of Infrastructure Planning
- R. Scheunemann, P. Eng, Planning Engineer
- D. James, P. Eng., Project Engineer
- L. Borgdorff, P. Eng., Senior Project Engineer
- J. Cavallo, LGL Limited (Environmental Consultants)
- A. Lacey, P. Eng. Read, Voorhees and Associates Ltd. (Transportation Consultant)
- M. Henry, Amick Consultants Ltd. (Archaeological Consultant)
- P. Bowen, P. Geo, P. Eng., Terraprobe Ltd. (Hydrogeologic Consultants)

Figure 1
MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS



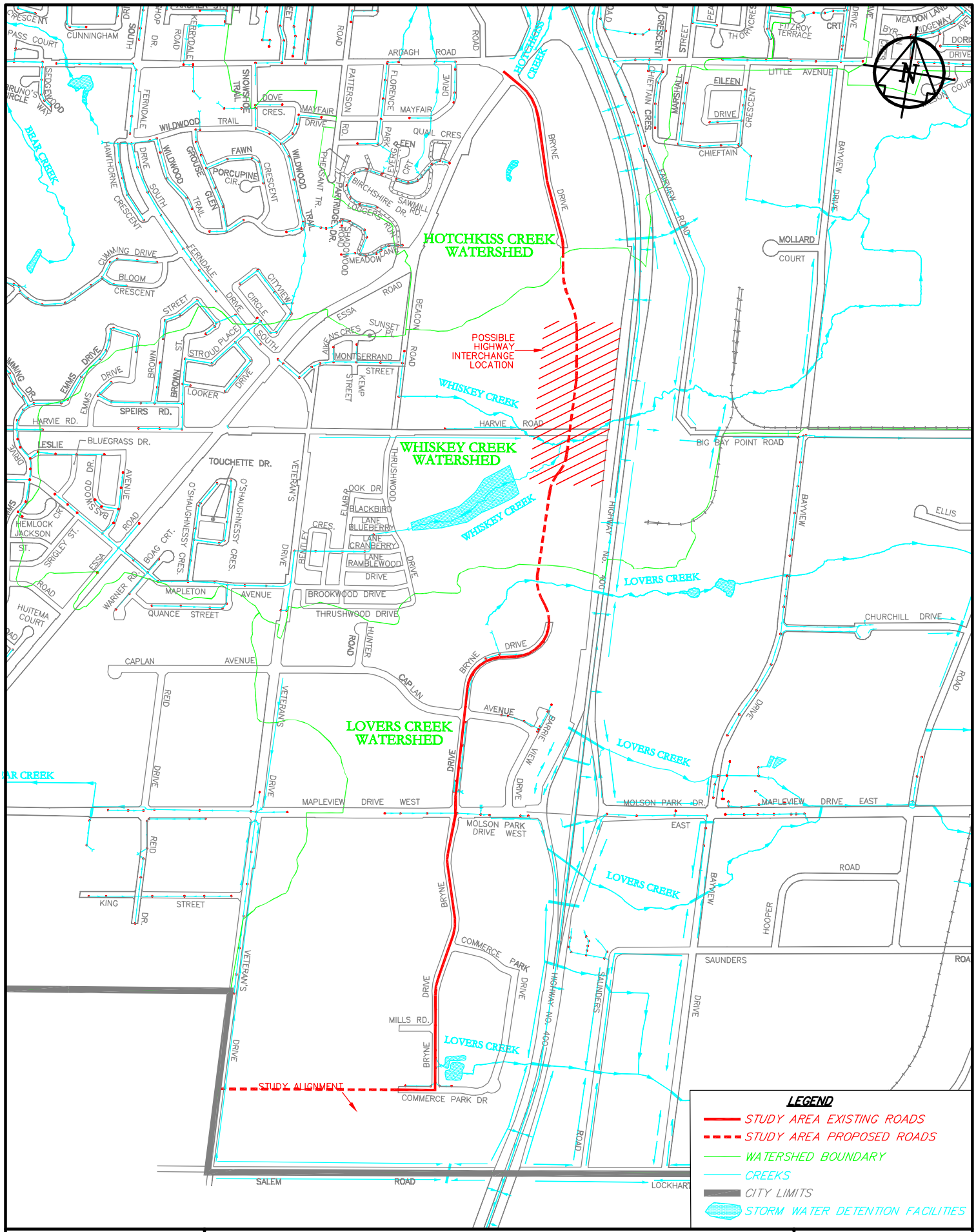
1.3 **Study Area**

The study area generally encompasses Veteran's Drive to the west, Commerce Park Drive to the south, Highway 400 to the east and Essa Road to the north, along the proposed Bryne Drive alignment (See Figure 2). Photos of the study area are shown in Appendix "E" and photo locations are shown on the Alternative 1 – "Do-Nothing" Drawings in Appendix "D".

1.4 **Objectives of the Report**

The overall objective of this report is to document the planning process for the potential widening and connection of Bryne Drive and Commerce Park Drive from Veteran's Drive to Essa Road, as established by the Class EA. This report builds on the "draft" report presented at the Open House. The objectives of this updated report are as follows:

- To prepare a detailed description of the problem;
- To establish alternatives solutions to address the problem;
- To prepare a detailed inventory of the natural, social, cultural and economic environment;
- To screen the impact of the alternatives on the environment;
- To establish mitigative measures to minimize potential environmental effects;
- To document the Open House which was held on June 27, 2005;
- To address any concerns which were raised;
- To develop the preferred alternative in consideration of comments received;
- To document Phases 1 and 2 of the Master Plan Class EA process; and
- To outline the remaining steps involved in the planning and design for the reconstruction and connection of Bryne Drive, from Veteran's Drive to Essa Road to complete the Master Plan Class EA process.



CITY OF BARRIE *ENGINEERING DEPARTMENT*	Figure 2 Bryne Drive Class EA Study Area	*DATE: March 21, 2005* *SCALE: NTS*

2.0 PHASE 1 – PROBLEM OR OPPORTUNITY

The City of Barrie has developed into its present form through population growth and annexation. The City has grown from the City Centre and north shore of Kempenfelt Bay southerly, around the west side of the bay encompassing Allandale, Painswick and more recently, the West 400 and Holly Planning Areas.

The impetus for this study is to meet the existing and future travel demand in the growing industrial and commercial areas in the West 400 and Holly Planning Areas. The City recognizes that to meet the transportation needs associated with existing and future growth, improvements to the transportation infrastructure are necessary.

From a road perspective, the City of Barrie currently has two existing major north-south arterials in the West 400 and Holly Planning Areas namely Essa Road and Veteran's Drive. Existing zoning allows commercial/industrial development in the West 400 Planning Area and the recent trend has been toward more commercial. Commercial development typically has substantially higher transportation needs than its industrial counterpart. The West 400 Planning Area was originally planned to be more industrial. This change in land use has resulted in considerable traffic congestion along both Mapleview Drive West and Bryne Drive, resulting in considerable delays and potential for more accidents, particularly during rush hour.

The 1999 City of Barrie Transportation Study identified the need for additional north-south vehicular capacity, west of Highway 400 to meet existing and future traffic demands. Bryne Drive/Commerce Park Drive from Veteran's Drive to Essa Road has been identified in planning documents as an arterial route ultimately connecting Veteran's Drive to Essa Road.

2.1 **Traffic Capacity Deficiencies**

A typical two lane arterial road can convey 10,000 vehicles per day (vpd) without congestion. At 12,000 vpd, some congestion is expected. Traffic counts undertaken by the City of Barrie in November 2004 recorded 16,000 vpd on the two lane section of Bryne Drive between Mapleview Drive and Commerce Park Drive North intersection (See Figure 1 in Appendix "A" for existing traffic volumes).

The 10-year forecasted traffic volume on Bryne Drive between Mapleview Drive and Commerce Park Drive (north intersection) is 20,000 vpd. Further south on Bryne Drive between Commerce Park Drive North and South intersection, the 10-year forecasted traffic volume is 14,000 (see Figure 2 in Appendix "A" for future traffic volumes).

2.1.1 Other Studies

The following transportation studies are currently underway or have recently been completed:

- A Municipal Class Environmental Assessment Addendum was recently completed for Veteran's Drive and the preferred design alternative, approved by Council by Motion 04-G-237, is five (5) lanes south of Mapleview Drive West. This work is currently in the City of Barrie's 2006 Capital Budget for the first 650 metres south of Mapleview Drive and in the 2007 Capital Budget for 650 metres south of Mapleview Drive to Salem Road;

- A Class Environmental Assessment was also recently completed and implemented, which included intersection improvements at Essa Road at Bryne Drive. Intersection improvements included two southbound turning lanes from Essa Road onto Bryne Drive;

- Totten Sims Hubicki Associates has been retained by North American to undertake an Engineering Feasibility Study for a possible new Highway 400 interchange at Harvie Road / Big Bay Point Road and Highway 400. The purpose of this study is to examine the feasibility of constructing a new Highway 400 interchange in this location to reduce existing and future traffic congestion in the South Barrie Area. If feasible, the interchange location and geometrics may effect the proposed alignment for Bryne Drive;

- The Ministry of Transportation (MTO) is currently undertaking a Planning and Preliminary Design Study to examine possible improvements required to address traffic operation, capacity and safety needs associated with the Highway 400 corridor through Barrie. This study identifies that Highway 400 may ultimately be widened to eight lanes from Barrie's south City limits to Essa Road, ten lanes from Essa Road to Bayfield Street and eight lanes from Bayfield Street North;

- Phases 1 and 2 of a Class Environmental Assessment were also completed for the proposed Harvie Road / Big Bay Point Road and Highway 400 underpass. Council, per Motion 05-G-343, approved seven lanes crossing under/over Highway 400; and

- A Class EA was also recently completed for Harvie Road between Bryne Drive and Essa Road and the preferred design alternative, approved by Council by Motion 02-G-534, is four lanes. This work is currently in the City of Barrie's 2007 Capital Budget.

2.2 **Pavement Structure Deficiency**

A road condition rating for Bryne Drive identifies that the pavement on Bryne Drive is generally in good condition, north of Mapleview Drive, but requires repairs from Mapleview Drive to Commerce Park Drive (north intersection). Discussions with City of Barrie's Operations / Maintenance staff, suggests that the problems with the pavement may be resulting from a deficient underlying road structure. It is anticipated that a Geotechnical Investigation will be undertaken during the next phase of this Class EA to investigate how to correct this pavement structure deficiency.

2.3 **Sidewalk Deficiency**

Relatively new sidewalks currently exist on the assumed opened portions of Bryne Drive from just south of the north intersection of Commerce Park Drive to Essa Road. The City of Barrie standard for an arterial roadway is an urban section with sidewalk on both sides. The unassumed portion of Bryne Drive (south of the Commerce Park Drive north intersection) and Commerce Park Drive, west of Bryne Drive, do not currently have sidewalks and are therefore deficient with respect to the current City's Standards. The existing sidewalks are relatively new and are in good condition.

2.4 **Storm Sewer Deficiency**

The opened portion of Bryne Drive has an urban cross-section utilizing curb and gutter, catch basins and storm pipes for local drainage. The City's Standard is to convey the 5-year flows in the storm pipes and the major event storms overland. The proposed storm sewer on Veteran's Drive is planned to outlet to the proposed storm sewer on Commerce Park Drive. There are no known conveyance deficiencies with respect to the storm drainage system, but this issue will be further reviewed at the detailed design stage. Some maintenance problems have been noted with maintenance hole frames and catchbasins between Mapleview Drive and Commerce Park Drive (north intersection). This problem is likely related to the pavement problem identified in Section 2.2, and will be further reviewed in the next phase of the Class EA.

2.5 **Bus Route Deficiency**

The existing bus route on Bryne Drive is negatively affected by traffic congestion in the Mapleview Drive and Bryne Drive area.

2.6 **Sanitary Sewer Deficiency**

Under the opened portions of Bryne Drive, south of Harvie Road, there is a sanitary sewer system in place which drains to the Paddison Farm Sanitary Trunk. The sanitary sewer that services the opened portions of Bryne Drive, north of Harvie Road is outside of the existing road right-of-way. The existing sanitary drainage system is adequate with respect to the City's Standards, although some problems have been noted with the maintenance holes between Mapleview Drive and Commerce Park Drive (north intersection). This problem is likely related to the pavement problem identified in Section 2.2 and will be further reviewed at the detailed design stage.

2.7 **Watermain Deficiency**

The opened portions of Bryne Drive are adequately serviced by existing watermains. Future watermains installed in unopened portions of the study area will eventually loop to the existing watermains thereby enhancing the existing water distribution network. The watermain network will be further reviewed in the next phase of the Class EA to determine what effects the increased water demand and the new links in the water network will have on operating pressures and fire flows.

2.8 **Problem / Opportunity Statement**

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

The City of Barrie is undertaking this project in response to problems and complaints associated with the congested transportation system on the west side of Highway 400 between Essa Road and Veteran's Drive. Proposed transportation improvements will result in an opportunity to correct existing infrastructure deficiencies and allow for future growth.

3.0 PHASE 2 - ALTERNATIVE SOLUTIONS

Integral to this planning process is the development of alternative solutions to correct the noted deficiencies. The alternatives presented in this section are potential solutions to problems which include some poor pavement structures, missing sidewalks and traffic congestion.

Moving the Bryne Drive / Harvie Road intersection alignment further west may have a negative effect on the physical environment associated with the existing stormwater management facility and the existing marsh area on the tributary to Whiskey Creek. Changes to the proposed Bryne Drive alignment will be examined as part of the Harvie Road Interchange Feasibility Study. Any substantial changes to the proposed alignment would be considered as part of the EA for the Harvie Road Interchange Feasibility Study. It is anticipated that Phases 3 & 4 of the Class EA will include the interchange, Harvie Road, and a portion of Bryne Drive.

The privately owned unopened portions of the road allowance are currently at varying stages of the development approval process, therefore realignment of the proposed Commerce Park Drive to Veteran's Drive or the proposed Bryne Drive north and south of Harvie Road may be a challenge, but will also be examined at the detailed design stage.

3.1 **Pre-Screened Alternatives Solutions**

The following alternative solutions were considered as potential alternatives in the planning process but were not carried forward as stand-alone alternatives, as they do not solve the problem statement:

- Non-structural improvement solutions such as more car-pooling, greater transit use and staggering of working times were considered to be beneficial; however, these measures would have only a minor impact on future traffic volumes and would not address any of the existing or future transportation/infrastructure deficiencies;

- Alternative routes are unpractical for the following reasons:

  - Many of the roads along the study alignment have been constructed to varying levels of service;

  - Development applications have been received for all unopened sections;

  - Other routes do not adequately address the traffic issue on existing portion of Bryne Drive;

  - Existing land use; and

  - Proximity of Veteran's Drive.

- The alternative of widening the proposed alignment to seven lanes would have a significant negative effect on existing properties along the alignment and is not required from a traffic capacity perspective.

3.2 **Alternative Solutions**

This section will identify the alternative solutions to the problems statement. There is usually more than one way to solve a problem. Therefore, the preferred solution may involve a combination of the following alternative solutions, which are all reasonable and feasible.

3.2.1 Alternative 1 – "Do-Nothing"

The "Do-Nothing" alternative allows for the consideration of not making any changes to the existing infrastructure and transportation network within the study area. This alternative provides a benchmark to gauge the environmental effect of not implementing changes to the existing transportation system. Please refer to "Alternative 1 – "Do-Nothing"", "Drawings 1 to 4" in Appendix "D".

3.2.2 Alternative 2 - Three Lanes (11 m asphalt 23 m Road Dedication)

Alternative 2 will connect existing north and south portion of Bryne Drive and connect Commerce Park Drive to Veteran's Drive with a three lane (11 m asphalt) urban road cross section in a 23 metre road right-of-way. Please refer to "Alternative 2 – Three Lane", "Drawings 1 to 4" in Appendix "D".

Please note that as part of this Alternative there would be no proposed geometric changes to the opened portions of Bryne Drive and operational improvements would be required on Harvie Road.

3.2.3 Alternative 3 – Four Lanes (14 m asphalt 26 m Road Dedication with Operational Improvements)

Alternative 3 will connect existing north and south portion of Bryne Drive and connect Commerce Park Drive to Veteran's Drive with a four lane (14 m asphalt) urban road cross section in a 26 metre road right of way. Please refer to "Alternative 3 – Four Lanes", "Drawings 1 to 4" in Appendix "D".

As part of this Alternative there would be the following potential geometric changes on the opened portion of Bryne Drive and Commerce Park Drive:

- Road widening and property acquisition on Commerce Park Drive west of Bryne;
- Intersection Improvements at Bryne Drive and Commerce Park Drive (South Intersection);
- Intersection Improvements at Bryne Drive and Commerce Part Drive (North Intersection);
- Road widening and property acquisition on Bryne Drive from Commerce Park Drive (south intersection) to south of Mapleview Drive West;
- Road widening and property acquisition on Bryne Drive, north of Caplan Avenue to existing north extent of Bryne Drive (north of Home Depot);
- Operational improvements on Harvie Road;

- Road widening and property acquisition on Bryne Drive from Leon's Furniture Ltd. to south of Essa Road; and

- Intersection improvements at Bryne Drive and Essa Road.

3.2.4 Alternative 4 - Five Lanes (18 m asphalt 30 m road dedication with Operational Improvements)

Alternative 4 will connect existing north and south portion of Bryne Drive and connect Commerce Park Drive to Veteran's Drive with a five lane (18 m asphalt) urban road cross-section in a 30 metre road right-of-way. Please refer to "Alternative 4 – Five Lanes", "Drawings 1 to 4" in Appendix "D".

As part of this Alternative there would be the following proposed geometric changes on the opened portion of Bryne Drive and Commerce Park Drive:

- Road widening and property acquisition on Commerce Park Drive, west of Bryne Drive;

- Intersection Improvements at Bryne Drive and Commerce Park Drive (South Intersection);

- Intersection Improvements at Bryne Drive and Commerce Park Drive (North Intersection);

- Road widening and property acquisition on Bryne Drive from Commerce Park Drive (south intersection) to just south of Mapleview Drive West;

- Intersection Improvements at Bryne Drive and Mapleview Drive West;

- Property acquisition on Bryne Drive between Mapleview Drive West and Caplan Avenue;

- Intersection Improvements at Bryne Drive and Caplan Avenue;

- Road widening and property acquisition on Bryne Drive from just north of Caplan Avenue to existing north extent of Bryne Drive (north of Home Depot);

- Operational improvements on Harvie Road;

- Road widening and property acquisition on Bryne Drive from Leon's Furniture Ltd. to just south of Essa; and

- Intersection improvements at Bryne Drive and Essa Road.

4.0 PROJECT ENVIRONMENT

This section provides a description of the *physical*, *social*, *cultural* and *economic* environment of the proposed Bryne Drive / Commerce Park Drive alignment from Veteran's Drive to Essa Road. A combination of field investigation, review of existing engineering drawings/reports, traffic studies, natural environment studies and an archaeological study established this inventory.

4.1 **Physical Environment**

4.1.1 Accommodate Existing and Future Traffic Demand

Read Voorhees & Associates Limited (RVA) undertook a Traffic Study to investigate the transportation issues associated with the study area. The "Draft" Study and the associated Existing and Future Traffic Volumes (Figure 2 & 3 respectively) can be found in Appendix "A". Report concludes that transportation improvements are required to accommodate existing and future traffic demands.

4.1.2 Compatibility with Existing and Future Road Network

The City of Barrie Transportation Study classifies Bryne Drive as an arterial road. Arterial roads are primarily traffic carrying facilities providing through routes across the City. Currently, only portions of this arterial route are constructed and the number of lanes and road dedication varies as follows:

- Two lanes (11 m pavement width, 23 m road dedication) on Commerce Park Drive, west of Bryne Drive;
- Three lanes (11 m pavement width, 23 m road dedication tapering to 26 m road dedication) from Commerce Park Drive (south intersection) to Commerce Park Drive (north intersection);
- Three lanes (11 m pavement width, 26 m road dedication) tapering to five lanes (18 m pavement width 32 m road dedication) from Commerce Park Drive (north intersection) to Mapleview Drive West;
- Five lanes (18 m pavement width, 26 m road dedication) from Mapleview Drive West to Caplan Avenue;
- Five lanes (18 m pavement width, 26 m road dedication) tapering to two lanes (11 m pavement width, 26 m road dedication) from just north of Caplan Avenue to the existing south terminus of Bryne Drive (north of Home Depot); and
- Two lanes (11 m pavement width 26 m road dedication) tapering to five lanes (18 m pavement 30 m road dedication) from the existing north terminus of Bryne Drive (south of Leon's Furniture Ltd.) to Essa Road.

4.1.3 Emergency Service

Emergency Police and Ambulance vehicles currently access the study area mainly from either, the existing Essa Road / Highway 400 interchange, or the Mapleview Drive / Highway 400 interchange. Fire Station 4 is located on Ardagh Road, west of Ferndale Drive.

4.1.4 Transit Service

Presently, there is a single bus route on Bryne Drive between Caplan Avenue and Commerce Park Drive (south intersection). The future plan is to extend this service to Essa Road.

4.1.5 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 is investing in a second Advance Road Weather Information Tower in South Barrie which will better assess and predict road weather and winter maintenance needs.

4.1.6 Major Services / 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 short section of 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 that any of the existing sanitary sewers or watermains would require upgrading. The storm system will require relocation of catchbasins, to satisfy road widening and may require some localized storm system upgrades.

Existing utility information is shown on the Alternative 1 – “Do-Nothing” drawings in Appendix “D”.

4.1.6.1 Storm Sewer System

The constructed portion of Bryne Drive, along the study alignment, utilizes storm pipes to convey minor rainfall events to a suitable outlet. Sizes vary from 300 mm to 1,650 mm diameter. Major storm events are conveyed via overland flow paths to a suitable discharge location.

The study area shown in Figure 1 crosses three drainage areas: Lover’s, Whiskey and Hotchkiss, all of which are part of the Lake Simcoe Watershed which drains to Lake Simcoe’s Kempenfelt Bay.

The proposed drainage outlet for Veteran’s Drive is along the proposed alignment for Commerce Park Drive from Bryne Drive to Veteran’s Drive.

4.1.6.2 Sanitary Sewer System

The Study Area lies within the Industrial, Bayview Drive and Mapleview Drive / Huronia Road (Paddison Farm) sanitary trunk drainage areas. The Industrial catchment services areas north of Leon's Furniture Ltd., the Bayview catchment services areas south of Leon's Furniture Ltd. and north of Home Depot and the Paddison Farm catchment services areas, south of Home Depot.

4.1.6.3 Electrical Distribution System

The electrical distribution consists of overhead supply lines with a combination of overhead and underground services. Overhead services currently exist on Bryne Drive, from Home Depot to Commerce Park Drive south intersection.

An existing overhead Hydro One transmission line crosses Bryne Drive between Mapleview Drive and Caplan Avenue.

4.1.6.4 Water Distribution System

Under the existing portions of the road alignment the watermain varies in size from 200 mm to 300 mm. There is currently no watermain under the unopened portions of the proposed road alignment.

A 500 mm diameter concrete and 400 mm diameter Ductile Iron (DI) watermain are located on Harvie Road, both of which cross under Highway 400. In the interim, the water distribution network will be looped to the 400 mm DI watermain. Ultimately, a 750 mm watermain will be installed from the proposed surface water treatment plant, at Big Bay Point Road, east of Hewitt's Creek to the Harvie Road Reservoir. The new watermain will cross Highway 400 on the Harvie Road alignment and continue west across the proposed Bryne Drive alignment.

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

4.1.6.5 Telephone System

There are several telephone ducts on the opened portions of the existing road dedication. Test pits will be required to confirm the elevation of the duct structures prior to construction of the preferred alternative design solution.

4.1.6.6 Gas Distribution System

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.

4.1.6.7 Cable TV System

The cable TV system in the study area is not expected to be significantly affected by any of the alternatives. Minor utility relocations will be accommodated as required during the detail design phase of the project.

4.1.7 Vehicle Parking

There is currently no on-street parking between Commerce Park Drive (north intersection) and Mapleview Drive and from Leon's Furniture Ltd. to Essa Road.

4.1.8 Natural Environment

LGL Limited was commissioned by the City of Barrie to provide services related to the natural environmental aspects of this project including tree/vegetation, fish and wildlife assessments that may be impacted by any of the alternatives. No Environmentally Significant Areas, Areas of Natural and Scientific Interest or Provincially Significant Wetlands are located within the study area. A portion of the study area is located within Lover's Creek Hydrogeological Environmentally Significant Area (ESA). The report can be reviewed in Appendix "C", and will be summarized in the following sections.

4.1.8.1 Fisheries and Aquatic Habitat

Along the proposed alignment there are two new proposed watercourse crossings. The first is located on a minor tributary to Lover's Creek north of Home Depot and the second on Whiskey Creek, immediately south of Harvie Road. Both proposed creek crossings are classified as *cold water fisheries*.

There are two existing watercourses along the study area. The first is a tributary to Hotchkiss Creek and is located immediately south of Essa Road (this tributary is enclosed upstream of Bryne Drive). The second is a tributary to Lover's Creek and is located north east of the Bryne Drive / Commerce Park Drive (south intersection). The headwaters for this tributary are also piped.

The tributary of Lover's Creek, north of Home Depot, consists of a poorly defined form with very little discharge within a well defined, relatively wide valley. Some groundwater seepage occurs along the edges of the valley bottom from Highway 400 to approximately 80 metres upstream. There is little or no riparian cover and the substrate consists of silt / organic / sand / gravel. No fish were observed, but this creek is considered to contribute to downstream habitat which supports brook trout.

The main channel of Whiskey Creek branches immediately to the west of the proposed road alignment and south of Harvie Road. Continuing upstream is an existing on-line stormwater treatment facility which has disrupted the natural flow pattern of the watercourse. The channel between the storm pond and Highway 400 is showing signs of erosion. Substrate consists of sand, gravel and silt and the riparian vegetation is limited, which may be contributing to bank erosion. There are some indications of groundwater discharge. No fish were found in this section of creek, but this creek is considered to contribute to downstream habitat which supports brook trout.

A Meander Beltwidth Assessment has been undertaken to determine recommended span widths for each creek crossing (see Appendix "K"). The report recommends that a 12.4 metre span width be used for Whiskey Creek and 13.75 metre span width be used for the Lover's Creek tributary. Potential negative effects to fish and aquatic habitat associated with the preferred alternative solution will be mitigated at detailed design.

No fish species at risk have been reported from the watercourses / waterbodies within the study area. Although brook trout, a sensitive coldwater species, exists within Lover's Creek and Whiskey Creek, the locations at which it has been recorded are outside of the study area. These watercourses contribute water on a seasonal basis to a coldwater system reported to contain brook trout.

4.1.8.2 Wildlife Habitat

Approximately half 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. A small pond in the south western part of the study area provides habitat for salamanders. A summary of wildlife documented in the study area during field investigations and using secondary source information is presented in Table 3 of LGL's Report in Appendix "C".

Sixty-nine of the bird species recorded for the study area are protected under the *Migratory Birds Convention Act* and five species are protected under the *Fish and Wildlife Conservation Act* (*FWCA*). Thirteen of the twenty-two species of mammals recorded and three herpetofauna are also protected under the *FWCA.*

4.1.8.3 Vegetation

Much of the vegetation in the study area is of anthropogenic origin, resulting from past agricultural uses and present residential and commercial uses. Land use in the study area varies with location. Land use surrounding the existing Bryne Drive right-of-way is primarily commercial. Land surrounding the area of the proposed Bryne Drive extension is predominantly vacant forested land.

Natural/semi-natural vegetation communities in the study area include coniferous, mixed and deciduous forests, deciduous swamps, thicket swamps and meadow marshes. Forests are predominantly young and are dominated by trembling aspen, white pine and/or green ash.

Cultural vegetation communities in the study area include cultural meadows and cultural woodlands, including recently cleared areas located to the north of the current northern terminus of Bryne Drive. These communities are dominated by grass and goldenrod species. Vegetation communities located within the study area are delineated in Figure 2 and described in Table 1 of LGL's Report in Appendix "C".

The vegetation communities identified within the study area are considered common and widespread throughout Ontario and secure globally.

4.1.8.4 Soils

Surface soils in the study area are characterized by sandy loam (Bs, DS) or loamy sand (Tis, Tis-Vasl). See Figure 4 – SCS Soils Map for locations.

The study area is located within the Peterborough Drumlin Field physiographic region. This area lies between the Simcoe Lowlands and the Oak Ridges Moraine physiographic regions. The underlying rock throughout most of this region consists of fossiliferous limestone that is fragile and easily weathered. Approximately 2,500 to 3,000 drumlins occur in this region characterized by rolling hills and depressions. The drumlins are comprised of mainly calcareous till and tend to be sandy within the subject area.

The soils within and adjacent to the study area are classified as Tioga Series, Bondhead Series and Dundonald Series. Generally, within the study area, the soils are defined by a boundary midway between Highway 400 and Veteran's Drive. On the east half, the soils are predominantly of the Tioga Series. On the west half and north of Mapleview Drive, the soils consist of Dundonald Series. To the south of Mapleview Drive, the soils are mainly of the Bondhead Series. Please refer to LGL's Report in Appendix "C" for additional information.

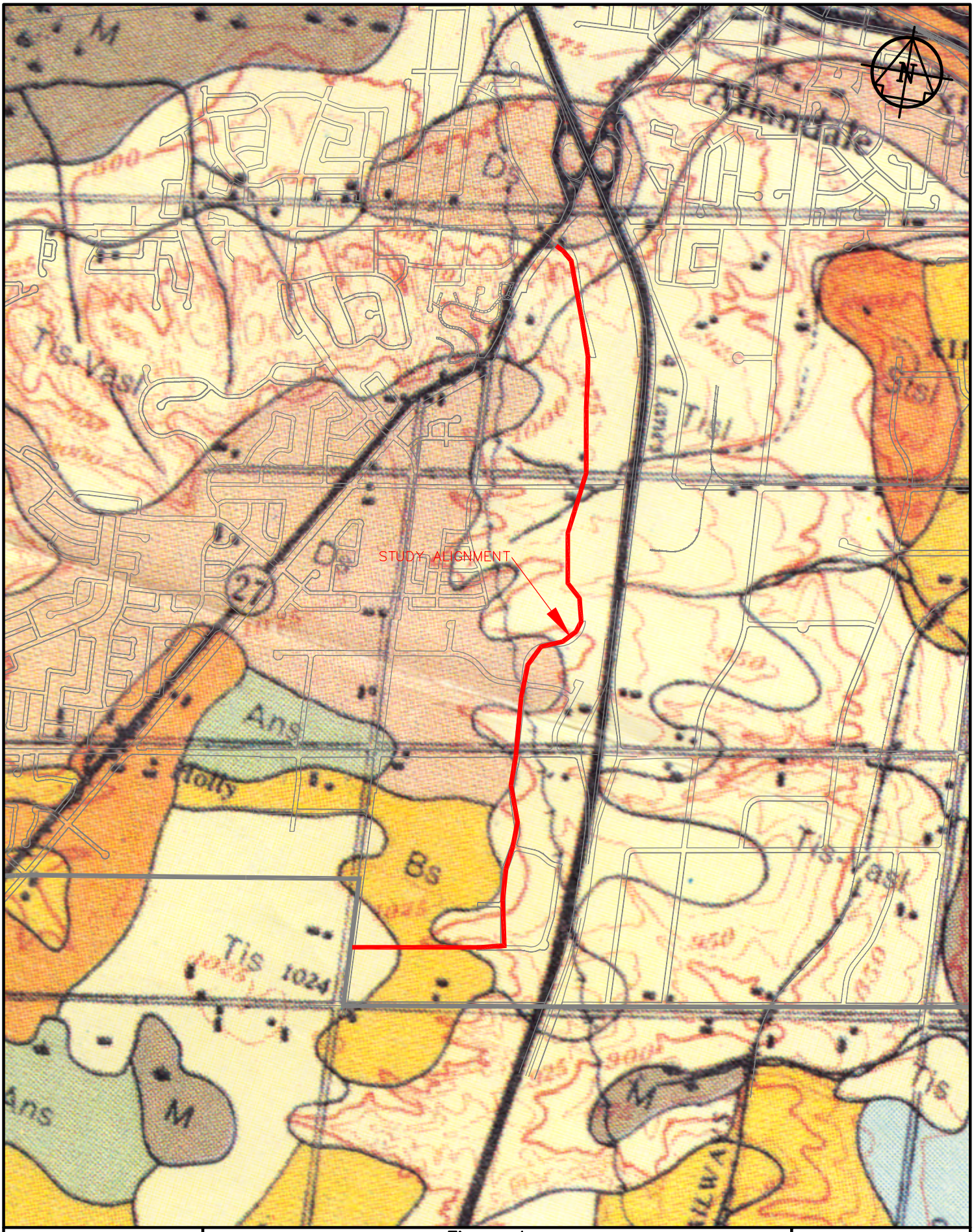
4.1.8.5 Groundwater Resources

The study area is located within a Hydrogeologic ESA is based on the recharge/discharge function of the local soils and geology. This Hydrogeologic ESA area has been identified in both the Lover's Creek MDP and the South Simcoe Municipal Groundwater Study. Terraprobe Ltd. has been retained to complete an assessment of the existing hydrogeologic condition of the study area, which provides coldwater base flow for both Lover's Creek and Whiskey Creek.

There are three main aquifer units that have been identified in the study area. The aquifer units have been divided into an Upper, Intermediate and Deep aquifer.

The Upper Aquifer system is the most relevant system for this study, as it provides interaction with the local surface water features. It is associated with the upland feature along the western potion of the Lover's Creek Watershed. The unit is typically encountered at an elevation of 310 metres to 250 metres (geodetic) and characterized by sandy soils. In most cases the Upper Aquifer is exposed at the surface but can also be covered locally with less permeable silt and clay. The sandy soils allow for moderate to high infiltration rates.

The Intermediate Aquifer occurs beneath the majority of the watershed and is found at elevations ranging between 250 metres to 220 metres. The deep aquifer underlies the north-east portion of the Lover's Creek Watershed and is encountered at elevations of approximately 180 metres to 160 metres. With the exception of the City of Barrie municipal wells there are few wells in the watershed that use this deep aquifer for supply. The



CITY OF BARRIE *ENGINEERING DEPARTMENT*	Figure 4 Bryne Drive Class EA SCS Soils Map	*DATE: MAY, 2005* *SCALE: NTS*

Upper and Intermediate Aquifer units generally provide sufficient quantity for most uses.

The entire western side of the Lover's Creek Watershed is considered an area of groundwater recharge. Groundwater flow in the Upper and Intermediate Aquifer units are considered to be important contributors to base flow. Estimates for the volume of recharge entering Upper Aquifer range from 115 mm to 220 mm/year.

Two areas of groundwater discharge were identified in the vicinity of Whiskey and the Lover's Creek tributary in the unopened sections of Bryne Drive south of Harvie Road. No significant surficial hydrogeologic features were identified south of Mapleview Drive

4.1.9 Water Quality / Stormwater Management

There are three existing major stormwater detention ponds in the study area in the following locations:

- Bryne Drive at Commerce Park Drive (south intersection). This on-line pond provides pre to post quantity and Level 1 (some Level 2) quality control for upstream catchment areas for storm events up to and including the 100-year rainfall event. The Bryne Drive / Commerce Park Drive pond was sized to accommodate the future run-off from the currently undeveloped industrial lands to the west.

- Harvie Road West of Highway 400. This on-line Whiskey Creek pond, also known as *Pond A*, provides quantity and Level 2 quality control, for storm events up to, and including, the 100-year. Any loss of storage between the pond and Highway 400 resulting from the construction of the proposed Highway 400 interchange or the proposed Harvie Road underpass will have to consider the downstream effects resulting from loss of storage and a dam-break of Pond A. The proposed study alignment will not affect Pond A or the existing storage between Pond A and Highway 400.

- West of Bryne Drive, south of Essa Road. This off-line pond provides quantity control for storm events up to and including the 100-year to the adjacent development.

The "Draft" Whiskey Creek Class EA Document identifies a proposed stormwater management pond north of the Harvey Road Reservoir. Several other ponds are being proposed as part of the development proposal between Harvie Road and Leon's Furniture.

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 Mapleview Drive and Bryne Drive.

4.2.2 Noise

There are no residential zoned properties within or adjacent to the study alignment. Therefore, the MOE regulations on noise levels in residential areas do not apply.

4.2.3 Sidewalk and Bicycle Paths

There are relatively new sidewalks on existing portions of Bryne Drive in the following areas:

- East side of Bryne Drive from 200 metres north of Mills Road to Home Depot;
- West side of Bryne Drive from Commerce Park (north intersection) northerly for approximately 180 metres;
- West side of Bryne Drive, from Mapleview Drive to Caplan Ave; and
- On both the east and west sides of Bryne Drive from Leon's Furniture Ltd. to Essa Road.

The proposed Bicycling Network for City of Barrie shows an on-road bicycle route from Commerce Park Drive to Leon's Furniture Ltd. It is anticipated that this proposed bike route would likely be extended from Veteran's Drive to Essa Road and that the cyclists would share the road with other traffic. For safety reasons, it would be preferable to have a dedicated bicycle route off the Bryne Drive / Commerce Park Drive arterial routes and road dedications.

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. 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

It is anticipated that driveways can be satisfactorily re-graded as part of any proposed road widening. Driveway details will be reviewed at detailed design.

4.3 **Cultural Environment**

4.3.1 Archaeological / Heritage Resources

A Stage 1 Archaeological Assessment was undertaken by Amick Consultants for the City of Barrie. Details of the "Draft" Stage 1 Archaeological Assessment can be reviewed in Appendix "B". The report concluded that there is a high potential for archaeological significance in the study area.

4.4 **Economic Environment**

4.4.1 Impact on Business

Business Owners in the Mapleview Drive and Bryne Drive area have advised that the existing traffic congestion is negatively impacting their business. Any improvement in traffic capacity would have a positive impact on business.

4.4.2 Budget Considerations

The Corporation of the City of Barrie has a 10-Year Capital Plan which is reviewed annually by Council. The following items apply:

- A Capital Fund (in the amount of $140,000) is currently available from reserves and DCA for road widening for Bryne Drive on the undeveloped lands south of Harvie Road;

- In the approved 2006 Capital Budget, $320,000 has been allocated to construct two additional lanes on Commerce Park Drive from Veteran's Drive to approximately 140 metres west of Bryne Drive.

- In the 2006–2015 Ten Year Capital Plan, $245,000 is proposed for road widening from 680 metres south of Essa Road to Harvie Road.

- Funding for the completion of the Class EA process for Bryne Drive and Commerce Park Drive has been included in the approved 2006 Capital Budget.

4.4.3 Infrastructure Maintenance Costs

Typically, the frequency of maintenance on roadways increases over the years as the rate of infrastructure deterioration increases. Most of the asphalt surface is relatively new. The section of Mapleview Drive to Commerce Park Drive (north intersection) is in poor shape and requires routine maintenance.

5.0 SCREENING OF ALTERNATIVE SOLUTIONS

The alternatives developed in Section 3 to correct the deficiencies noted in Section 2 are to be screened with respect to their impact on the *physical*, *social*, *cultural* and *economic* environments presented in Section 4. For each of the above criteria, sub-factors were established, which are presented in Tables 1, 2, 3 and 4 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.

The results of the Traffic Study prepared by Read Voorhees & Associates Limited (See Appendix "A"), the Stage 1 Archaeological Assessment prepared by Amick Consultants Ltd (See Appendix "B"), the Natural Environment Assessment prepared by LGL Limited (See Appendix "C") and the Hydrogeologic Investigation by Terraprobe Ltd. (See Appendix "F"), and the Meander Beltwidth Assessment prepared by JTB Environmental Systems Inc. have been incorporated into the evaluation for the various alternatives.

5.1 **Alternatives Analysis**

5.1.1 Overview

The following overview applies to all the alternatives:

- The connection of Bryne Drive / Commerce Park Drive, from Veteran's Drive to Essa Road, will improve emergency vehicle response times by reducing traffic congestion, and by providing new transportation routes.

- Off-street parking would not be affected by any of the proposed alternative solutions, but some driveway entrances may be impacted.

- The extensions of Bryne Drive and Commerce Park Drive have the potential to alter water quality and quantity by reducing the permeability of the ground resulting in increased run-off of surface water. An increase in run-off may promote erosion downstream, thus impairing water quality with sediments. The thermal regime of a receiving watercourse may also be altered by stormwater run-off which is super-heated through contact with paved surfaces, which, when discharged to a receiving watercourse can result in thermal shock, thereby injuring or killing aquatic organisms. Cold water streams are more sensitive to changes in water temperature than warm water streams. A Stormwater Management Plan will be prepared during detail design to address potential water quality, quantity and thermal effects. It is anticipated that run-off from Bryne Drive and Commerce Park Drive will be collected in storm sewers and conveyed to existing Stormwater Treatment Facilities. Where warranted enhanced grassed swales, perforated storm sewers, oil/grit separators, infiltration/exfiltration trenches, filter strips, planting along stream banks, etc. will be incorporated into the design of Bryne Drive and Commerce Park Drive on a site-specific basis. It is recommended that Level 1 treatment be provided for all receiving watercourses, regardless of the type of fish habitat present. These stormwater practices will maintain the quality and quantity of surface water run-off in the study area.

- The extensions of Bryne Drive and Commerce Park Drive have the potential to alter base flow conditions by reducing the permeability of the ground, thus reducing

infiltration and subsequent discharge to watercourses through springs, seeps and groundwater upwellings. A Water balance study will be prepared during detail design to address potential reductions in base flow. Methods that encourage infiltration such as infiltration trenches, perforated storm sewers and detention ponds will be implemented, as warranted.

- Disturbance to trees and vegetation as a result of the extension of Bryne Drive and Commerce Park Drive is not considered significant since the majority of the vegetation located adjacent to the right-of-way has been previously disturbed by agricultural practices, urban development, and as a result of the proximity of Highway 400.

- No terrestrial wildlife species of management concern beyond the local (upper tier municipal jurisdiction) level were recorded during field investigations in the study area. Therefore none of the terrestrial wildlife listed under the *Species at Risk Act* or the *Endangered Species Act* were identified in the study area.

- This Stage 1 Archaeological Assessment has found high potential for cultural significance but recent archaeological assessments undertaken for development and construction activities along the developed portions of the study alignment has identified these areas as of no/minimal potential to yield significant archaeological resources. This Stage 1 Archaeological Assessment recommends that a Stage 2 Archaeological Assessment be undertaken.

5.1.2 Alternative 1 – "Do-Nothing"

Alternative 1 will have a greater number of significant negative effects on the environment compared to positive effects and the natural environment is not affected. Table 1 details the areas of potential affect.

The physical environment, in terms of existing infrastructure and pavement structure will continue to deteriorate with time. Maintenance costs are expected to increase as the deterioration continues. The result is a negative impact on aspects of the *physical*, *social*, *heritage* and *economic* environment.

As the population of the City of Barrie grows the volume of traffic on Bryne Drive, Mapleview Drive and Essa Road will increase as commercial and industrial areas in the City's southwest develops. The number of complaints, disruption to enjoyment of ride and potential negative impact on property values will increase as the infrastructure continues to deteriorate and traffic increases.

5.1.3 Alternative 2 – Three Lanes (11 m asphalt 23 m road dedication)

This alternative includes the construction of a three lane road (11 m pavement width) urban section along the unopened portions of the study alignment. Works include the construction of curb and gutters, storm sewers/servicing, sanitary sewers/servicing, water mains/servicing, and sidewalks. Existing portions of Bryne Drive would remain substantially unchanged. Intersection operational improvements, such as turning lanes, would be developed at detailed design. Table 2 details the areas of potential environmental effect.
Private lands would have to be acquired for the unopened portions of the proposed road alignment from Commerce Park Drive to Veteran's Drive and both north and south of Harvie Road.

This alternative will have a minor net positive effect on the existing physical environment resulting from some improvements in existing traffic flow. Future traffic volumes could not be accommodated by this alternative solution. The net effect on the social environment is slightly positive due to less traffic congestion and improvements in business. The economic environment would be negatively impacted due to the increased cost of construction over the "Do-Nothing" alternative.

This alternative would not accommodate the increased traffic resulting from the possible Highway 400 interchange or the proposed underpass at Harvie Road/Big Bay Point Road.

While connectivity improvements will somewhat improve the existing traffic problems along Bryne Drive, it would not address the future traffic capacity issue or noted pavement structure and sidewalk deficiencies on the existing portions of Bryne Drive.

The natural environment is negatively affected by proposed road improvements but to a lesser degree than Alternatives 3 and 4. Negative affects are not considered significant and can be mitigated.

5.1.4 Alternative 3 – Four Lanes (14 m asphalt 26 m road dedication)

This alternative includes the construction of a four lane road (14 m pavement width) urban section along the unopened portions of the study alignment. Works include the construction of curb and gutters, storm sewers/servicing, sanitary sewers/servicing, water mains/servicing, and sidewalks. Table 3 details the areas of potential environmental effect.

Private lands would have to be acquired for the unopened portions of the proposed road alignment from Commerce Park Drive to Veteran's Drive and both north and south of Harvie Road. Also, three additional meters of road right-of-way would be required along Commerce Park Drive and on Bryne Drive to just south of Commerce Park Drive (north intersection). Road widening would be required along most of Bryne Drive, but not in the following locations:

- From just south of Mapleview Drive to just north of Caplan Avenue; and
- From Days Inn north to the intersection with Essa Road.

Intersection operational improvements associated with this alternative may be required at:

- Commerce Park Drive (north intersection) and Bryne Drive;
- Commerce Park Drive (south intersection) and Bryne Drive; and
- Harvie Road

Additional turning lanes may be required at:

- Additional right hand turning lane from Bryne Drive onto Mapleview Drive;
- Additional left hand turning lane from Mapleview Drive onto Bryne Drive; and
- Additional right hand turning land from Bryne Drive onto Essa Road.

Details for these improvements will be reviewed at detailed design.

This alternative will have a net positive effect on the existing physical environment resulting from improvements in existing traffic flow. Future traffic volumes could be partially

accommodated by this alternative solution. The net effect on the social environment is positive due to less traffic congestion and improvements in business. The economic environment would be negatively impacted due to the increased cost of construction over the three lane alternative, but it should be noted that the unopened portions of Bryne Drive could be constructed by developers.

This alternative would improve the existing traffic problems along Bryne Drive, but likely would not adequately handle the increased traffic resulting from the new proposed Highway 400 interchange at Harvie Road/Big Bay Point Road. Safety would be impacted by lack of a dedicated centre turning lane to access the future industrial/commercial development.

The natural environment is negatively affected by proposed road improvements but to a lesser degree than Alternatives 4. Negative affects to the natural environment are not considered significant and can be mitigated.

5.1.5 Alternative 4 - Five Lanes (18 m asphalt 30 m road dedication)

This alternative includes the construction of a five lane road (18 m pavement width) urban section along the unopened portions of the study alignment. Works include the construction of curb and gutters, storm sewers/servicing, sanitary sewers/servicing, water mains/servicing, and sidewalks. Table 4 details the areas of potential environmental effect.

Private lands would have to be acquired for the unopened portions of the proposed road alignment from Commerce Park Drive to Veteran's Drive and both north and south of Harvie Road.

Additional road dedications would be required along the opened portions of the existing road alignments.

Existing roads would require widening, except for a short section of Bryne Drive immediately south of Essa Road, and between Mapleview Drive West and Caplan Avenue.

Intersection operational improvements associated with this alternative will be required at:

- Commerce Park Drive (north intersection) and Bryne Drive;
- Commerce Park Drive (south intersection) and Bryne Drive;
- Caplan Ave; and
- Harvie Road.

Additional turning lanes are anticipated at:

- Additional right-hand turning lane from Bryne Drive onto Mapleview Drive;
- Additional left-hand turning lane from Mapleview Drive onto Bryne Drive; and
- Additional right-hand turning lane from Bryne Drive onto Essa Road.

Details for these intersection improvements will be reviewed at detailed design.

This alternative will have a net positive effect on the existing physical environment resulting from improvements in existing and future traffic flow. Future traffic volumes could be accommodated by this alternative solution, but this alternative will have a negative impact on the existing fire hydrants and overhead hydro. The net effect on the social environment

is positive due to less traffic congestion and improvements in business in both the short term and long term. The economic environment would be negatively impacted due to the minor increased cost of construction over the four lane alternative, but it should be noted that the unopened portions of Bryne Drive could be constructed by developers.

The improvements associated with this alternative would accommodate existing and future traffic volumes along Bryne Drive and it anticipated that this alternative would also handle the increased traffic resulting from the new proposed Highway 400 interchange at Harvie Road/Big Bay Point Road.

This alternative has the greatest effect on the natural environment. Negative effects to the environment are not considered significant and can be mitigated.

TABLE 1

Alternative 1 – "Do-Nothing"

Area of Potential Environmental Effect	No Effect		Potential Effect (Significance Unknown)		Significant Effect		Comments
	On Site[1]	Off Site[2]	On Site[1]	Off Site[2]	On Site[1]	Off Site[2]	
Physical Environment							
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 accommodates new 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					
Impact on Vehicle Parking	X	X					
Fisheries & Aquatic Habitat	X	X					
Wildlife Habitat	X	X					
Vegetation	X	X					
Groundwater Resources	X	X					
Water Quality / Stormwater Management	X	X					
Social Environment							
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
Cultural Environment							
Archaeological / Heritage Resources	X	X					
Economic Environment							
Impact on Business					-ve	-ve	Traffic congestion currently effects area businesses
Impact on Infrastructure Maintenance Costs		X	-ve				Infrastructure relatively new. Regular maintenance is required on Bryne between Mapleview and Commerce (north intersection)
Impact on Property Acquisition Costs					+ve	+ve	No additional property required along proposed alignment
Impact on Construction Costs					+ve	+ve	No construction costs

[1] On-Site refers to the study area [2] Off-Site refers to lands outside of the study area
-ve = negative effect +ve = positive effect X = neither positive or negative effect

TABLE 2

Alternative 2 – Three Lanes Screening of Alternative

Area of Potential Environmental Effect	No Effect		Potential Effect, Significance Unknown		Significant Effect		Comment
	On Site[1]	Off Site[2]	On Site[1]	Off Site[2]	On Site[1]	Off Site[2]	
Physical Environment							
Accommodation of Existing and Future Traffic Demand			+ve	+ve			Reduces existing traffic congestion
Compatibility With Existing and Future Road Network			+ve	-ve			Does not 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	X	X					
Major Services / Utility Conflicts	X	X					
Impact on Vehicle Parking	X	X					
Fisheries and Aquatic Habitat			-ve	-ve			More thermal pollution. Additional Creek crossings
Wildlife Habitat	X	X					Wildlife habitat not of major significance because of urban nature of study area
Vegetation	X	X					Vegetation not of major significance because of disturbed nature of study area
Groundwater Resources	X			-ve			Two areas of groundwater resources are affected
Water Quality / Stormwater Management			-ve	-ve			Additional run-off from roads
Social Environment							
Existing Buildings	X	X					No building demolition required
Existing Properties	X	X					
Noise	X	X					
Pedestrian / Cyclist Facilities					+ve	+ve	New sidewalks and roads for cyclists
Aesthetics	X	X					
Access to existing properties			+ve	+ve			Reduced traffic congestion would increase access
Cultural Environment							
Archaeological / Heritage Resources		X			+ve		
Economic Environment							Some on-street parking lost
Impact on Business			+ve	+ve			Improves area business
Impact on Infrastructure Maintenance Costs			+ve	+ve			Infrastructure relatively new. Regular maintenance is required on Bryne Drive between Mapleview Drive and Commerce Park Drive (north intersection)
Impact on Property Acquisition Costs			-ve	-ve			Additional property required along proposed alignment
Impact on Construction Costs			-ve	-ve			Minimal construction costs

[1] On-Site refers to the study area [2] 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 3 - Four Lanes Screening of Alternative

Area of Potential Environmental Effect	No Effect		Potential Effect, Significance Unknown		Significant Effect		Comment
	On Site[1]	Off Site[2]	On Site[1]	Off Site[2]	On Site[1]	Off Site[2]	
Physical Environment							
Accommodation of Existing and Future Traffic Demand				+ve	+ve		Meets existing transportation needs
Compatibility With Existing and Future Road Network				-ve	+ve		Does not 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			Some relocation of overhead supply lines may be required south of Commerce Park (north intersection)
Impact on Vehicle Parking	X	X					
Fisheries and Aquatic Habitat			-ve	-ve			More thermal pollution. Additional Creek crossings
Wildlife Habitat	X	X					Wildlife habitat not of major significance because of urban nature of study area
Vegetation	X	X					Vegetation not of major significance because of disturbed nature of study area
Groundwater Resources	X			-ve			Two areas of groundwater resources are effected
Water Quality / Stormwater Management			-ve	-ve			Additional run-off from roads
Social Environment							
Existing Buildings	X	X					No building demolition required
Existing Properties			-ve	-ve			Some additional property required
Noise			-ve	-ve			Increased noise from increased traffic volumes
Pedestrian / Cyclist Facilities					+ve	+ve	New sidewalks / roads for cyclists
Aesthetics			+ve	+ve			Additional landscape opportunities in boulevards
Access to existing properties					+ve	+ve	Reduced traffic congestion would increase access
Cultural Environment							
Archaeological / Heritage Resources		X			+ve		
Economic Environment							
Impact on Business					+ve	+ve	Improves area business. Some on-street parking lost
Impact on Infrastructure Maintenance Costs			+ve	+ve			Infrastructure relatively new. Regular maintenance is required on Bryne Drive between Mapleview Drive and Commerce Park Drive (north intersection)
Impact on Property Acquisition Costs			-ve			-ve	Additional property required along proposed alignment
Impact on Construction Costs					-ve	-ve	Second most expensive

[1] On-Site refers to the study area [2] 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 4 - Five Lanes Screening of Alternative

Area of Potential Environmental Effect	No Effect		Potential Effect, Significance Unknown		Significant Effect		Comment
	On Site[1]	Off Site[2]	On Site[1]	Off Site[2]	On Site[1]	Off Site[2]	
Physical Environment							
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			Some telephone relocation may be required. Relocation of overhead hydro supply lines may be required south of Commerce Park Drive (north intersection) and north of Caplan Ave and south of Mapleview Drive. The gas main may be also affected and require relocation.
Impact on Vehicle Parking	X	X					
Fisheries and Aquatic Habitat			-ve	-ve			More thermal pollution. Additional Creek crossings
Wildlife Habitat	X	X					Wildlife habitat not of major significance because of urban nature of study area
Vegetation	X	X					Vegetation not of major significance because of disturbed nature of study area
Groundwater Resources	X			-ve			Two areas of groundwater resources are effected
Water Quality / Stormwater Management			-ve	-ve			Additional run-off from roads
Social Environment							
Existing Buildings	X	X					No building demolition required
Existing Properties			-ve	-ve			Some additional property required
Noise			-ve	-ve			Increased noise from increased traffic volumes
Pedestrian / Cyclist Facilities					+ve	+ve	New sidewalks / roads for cyclists
Aesthetics			+ve	+ve			Additional landscape opportunities in boulevards
Access to existing properties					+ve	+ve	Reduced traffic congestion would increase access
Cultural Environment							
Archaeological / Heritage Resources		X			+ve		
Economic Environment							
Impact on Business					+ve	+ve	Improves area business. Some on-street parking lost
Impact on Infrastructure Maintenance Costs			+ve	+ve			Infrastructure relatively new. Regular maintenance is required on Bryne Drive, between Mapleview Drive and Commerce Park (north intersection)
Impact on Property Acquisition Costs					-ve	-ve	Additional property required along proposed alignment
Impact on Construction Costs					-ve	-ve	Most expensive

[1] On-Site refers to the study area [2] Off-Site refers to lands outside of the study area
-ve = negative effect +ve = positive effect X = neither positive or negative effect

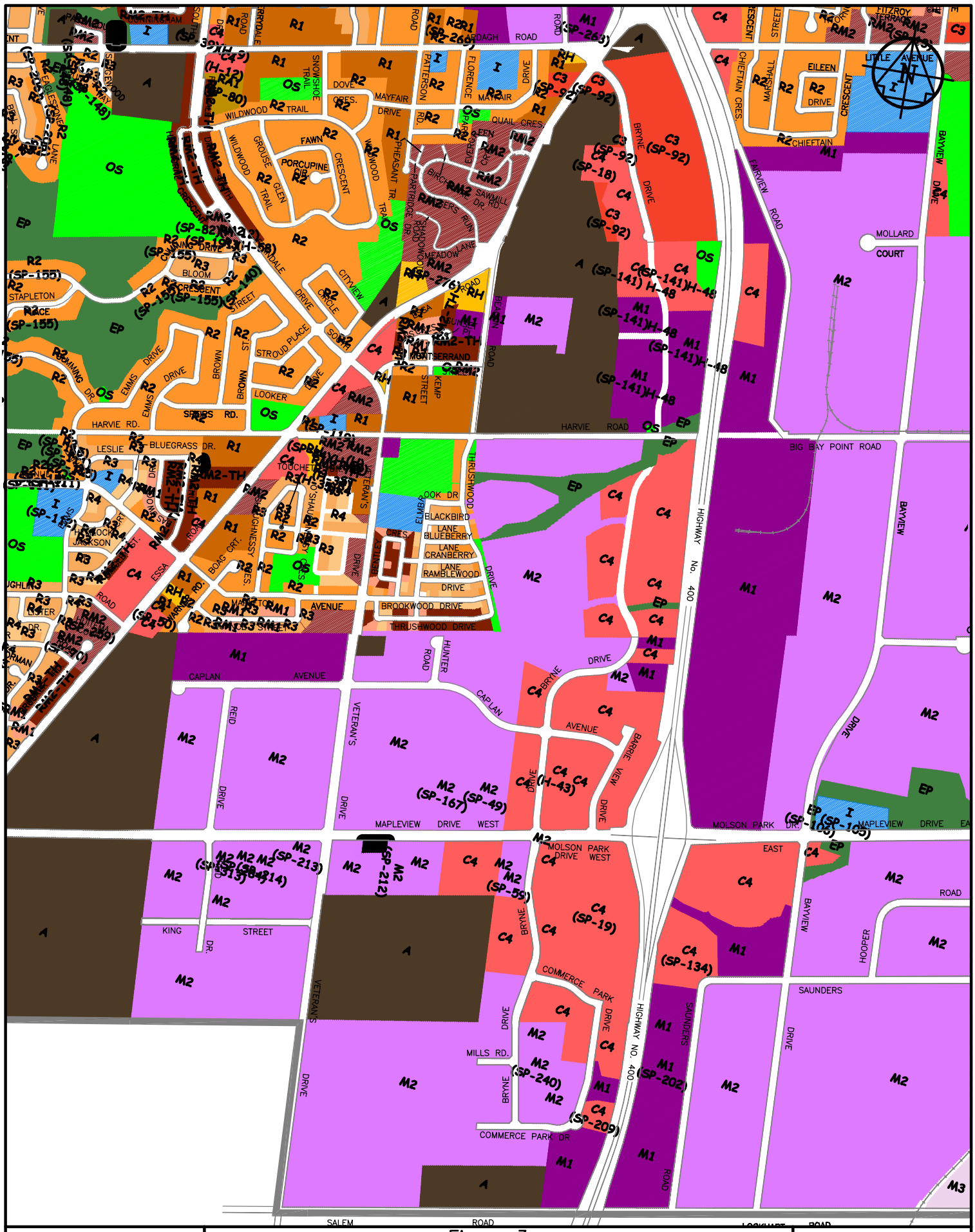
5.1.6 Property Acquisition Costs

Property acquisition unit costs for each Alternative Solution were derived from "City of Barrie Development Charge Background Study for City-Wide Development Charge By-Law" amended June 10, 2003. Areas were derived from the Alternative Solution Drawings in Appendix "D", using the zoning information shown in Figure 3. For comparison purposes, it is assumed that these lands would have to be acquired through agreed purchases. Undeveloped lands would be transferred to the City of Barrie through Development Agreements and have therefore, not been included in Table A (proposed property acquisition associated with the Preferred Alternative Solution has also been included in Table A and will explained in subsequent sections of this report).

TABLE A

Property Acquisition Costs in Developed Areas

ALTERNATIVE NO.	LAND USE	AREA (m^2)	UNIT COSTS ($\$/m^2$)	COST ($)
Alternative 1	Residential	0	108	0
	Industrial	0	22	0
	Commercial	0	215	0
	Total			**$0**
Alternative 2	Residential	0	108	0
	Industrial	0	22	0
	Commercial	0	215	0
	Total			**$0**
Alternative 3	Residential	0	108	0
	Industrial	1,300	22	28,600
	Commercial		215	0
	Total			**$28,600**
Alternative 4	Residential	0	108	0
	Industrial	4,400	22	96,800
	Commercial	4,500	215	967,500
	Total			**$1,064,300**
Preferred Alternative	Residential	0	108	0
	Industrial	1,300	22	28,600
	Commercial	0	215	0
	Total			**$28,600**



CITY OF BARRIE *ENGINEERING DEPARTMENT*	Figure 3 Bryne Drive Class EA Zoning	*DATE:* MAY, 2005 *SCALE:* NTS

5.1.7 Construction Costs

For comparison purposes, construction costs have been estimated using per metre unit prices, as calculated in Appendix "L". For new roads, unit length cost calculations include roads, utilities and sidewalks. For widening existing roads, unit length costs calculations included road widening; relocation of curbs, sidewalks, utilities poles and fire hydrants; and the re-grading of driveways. Unit length costs are summarized as follows:

- $1,650/m for 11 m new road (3 lanes);
- $1,800/m for 14 m new road (4 lanes);
- $1,950/m for 18 m new road (5 lanes);
- $650/m for widening existing ±11 m (3 lanes) to 14 m (4 lanes); and
- $800/m for widening existing ±11 m (3 lanes) to 18 m (5 lanes).

In specific areas, requirements to oversize proposed utilities would be common to all alternatives. Therefore, for comparison purposes, these costs have not been included. Also, in some areas, proposed utility relocation or sidewalk relocation may not be required because they do not exist, but for comparison purposes have been included. A detailed cost estimate will be undertaken in the next phase of the Class EA. Preliminary cost estimates for the various alternatives are as follows:

TABLE B

Preliminary Cost Estimates

ALTERNATIVE	CALCULATION	COST
1 – "Do-Nothing"	n/a	$0
2 – 3 Lanes (11 m asphalt)	2,100 m x $1,650/m	$3,465,000
3 – 4 lanes (14 m asphalt)	2,100 m x $1,800/m + 1,700 m x $650/m	$3,885,000
4 – 5 Lanes (18 m asphalt)	2,100 m x $1,950/m+ 1,960 m x $800/m	$5,663,000

Detailed cost estimates will be derived at the detailed design stage. Please note, that the above construction cost estimates do not include any allowance for engineering, intersection improvements; correction of deficient utility or road infrastructure, or property acquisition.

5.2 **Public Consultation**

5.2.1 Notice of Class Environmental Assessment (Class EA)

The "Draft" Class EA Report was made available to all interested agencies and the public to review from June 22, 2005 to July 18 2005 at the City of Barrie's 1st floor Clerk's Office, the City of Barrie's 6th floor Engineering Department and the Barrie Public Library.

Letters and Comment Sheets were mailed to property owners directly affected, advising of an Open House on June 27, 2005 in Huronia Room "B" from 4:00 p.m. to 7:00 p.m. The following agencies/consultants were also circulated:

- Barrie Hydro;
- Rogers Cable;
- Bell Canada;
- Ministry of the Environment (SW Region);
- Ministry of Natural Resources;
- Ministry of Transportation;
- Department of Fisheries and Oceans (DFO);
- Heritage Barrie;
- Lake Simcoe Region Conservation Authority;
- City of Barrie, Leisure, Transit and Works Department;
- City of Barrie, Planning and Development Department;
- Downtown Barrie BIA;
- Enbridge Gas Distribution;
- ACDC;
- Ministry of Culture;
- Ontario Power Generation;
- Hydro One;
- The New VR (CHUM);
- Lorne Property Group; and
- R.G. Robinson & Associates (Barrie) Limited / TSH.

In addition to the mail-out, the Open House was advertised in the Barrie Examiner on June 17 and 21, 2005. Copies of the Memo to Council (advising of the Open House), mailed letters, Comment Sheet, Notice of Open House advertisements, attendance register and digital photos of display drawings and mailing lists are contained in **Appendix "G"**.

5.2.2 Results of Public Consultation

Eight attendees signed the register and additional copies of the mail-out letter and Comment Sheet were available at the Open House. Members of the Study Team hosted the Open House and presented the need and justification for the Study, each Alternative being considered and discussed any concerns posed by the members of the public.

5.2.2.1 Public Preference

Four of the Comment Sheets returned to the Engineering Department indicated a preferred alternative. Three out of the four Comment Sheets preferred the Four Lane Alternative, one Comment Sheet preferred the Five Lane Alternative.

5.2.2.2 Areas of Concern

Four Comment Sheets and two letters were received. Of the Agencies / Consultants initially solicited, comments were received from TSH, MOE and LSRCA. **Table 7** provides a summary of the comments and responses received (please refer to Appendix "H" for the original correspondence).

TABLE 7

Comments and Responses

Concerns expressed from the June 27, 2005 Open House are summarized with the corresponding response, as follows:

MAJOR ITEMS OF ISSUE	RESPONSE
With respect to the undeveloped lands south of Harvie Road, the property owner is concerned that any of the Alternatives which propose to increase the required width of right-of-way will result in a loss of developable land and increase road construction costs.(1)	It is anticipated that the recommendation of the Bryne Drive Class EA will be incorporated into the updated OP and be presented to General Committee in February 2006. Currently, City Capital Funds have been allocated for constructing one additional lane of road width. The loss of developable land due to the increased road allowance will result in a safer transportation system that will improve access to the future adjacent commercial / industrial lots. Increasing the proposed road dedication from 26 m to 30 m will result in a very minor loss of developable land.
With respect to the undeveloped lands between the west terminus of Commerce Park Drive and Veteran's Drive, the property owner is concerned that any of the Alternatives which propose to increase the required width of right-of-way will result in a loss of developable land and increase road construction costs. (1)	A 30 metre road allowance is currently being negotiated with the Developer. The City of Barrie has allocated funds in the approved 2006 Capital Budget to widen from 3 lanes to 5 lanes. Increasing the proposed road dedication from 26 m to 30 m will result in a very minor loss of developable land.
With respect to the existing developed lots fronting Bryne Drive and Commerce Park Drive, south of Mapleview Drive, the property owner is concerned with any Alternative which reduces existing landscaping / aesthetics or parking on his property. He is also concerned that these same Alternatives may devalue his property. (1)	The existing road allowance, between Mapleview Drive West and Commerce Park Drive (north intersection), varies from 32 m at Mapleview Drive West to 26 m at Commerce Park Drive (north intersection). The existing road allowance between the north and south intersections of Commerce Park Drive and Bryne Drive varies from 26 m in the north to 23 m in the south. To minimize the effect on adjacent properties, the Preferred Alternative Solution recommends that a 5 lane road be constructed within a minimum 26m road dedication, along existing portions of the road alignment. Proposed road widening would not affect existing off street parking. Landscaping and aesthetics characteristics will be incorporated into the design alternatives during the next phase of the Class EA. Commercial and industrial property values typically benefit from improved transportation linkages.
Temporary road closures would negatively impact businesses. (2)	In commercial areas, it is the City of Barrie practice to keep to the road open wherever practical. Any proposed construction activities would include a plan to minimize road closures, and allow for continued access to all area businesses.
Consideration is to be given to the IGAP work to improve water quality in Lake Simcoe.(3)	Proposed transportation improvements are within the City of Barrie. One of City of Barrie's Top Ten Priorities is the "Reduction of Pollution in Lake Simcoe". The City will continue to work with IGAP, MOE, LSRCA, and LSEMS to achieve this priority. The LSRCA hosted the LSEMS Conference on October 20-21, 2005. The LSRCA advised that 24 years of MOE water quality data in Kempenfelt Bay (Monitoring Station K39) shows a substantial improvement in water quality, even though the City of Barrie has experienced substantial growth over this same time period (See Appendix "J" in the Bryne Drive & Commerce Park Drive Master Plan Municipal Class Environmental Assessment Document).

	The following initiatives are proposed to further improve water quality: • The City of Barrie and the LSRCA require enhanced stormwater quality control for all new developments; and • Proposed road improvements will include water quality improvement features as feasible.
Recognition of environmental issues associated with watercourse crossing. (3)	The environmental issues associated with the watercourse crossings have been identified and documented in LGL's Environmental Report dated October 2005. The implementation of works associated with the Preferred Alternative Solution will require the protection and replacement of fish habitat, vegetation, and terrestrial habitat. Details of a proposed work plan will be addressed in Phases 3 and 4 of this Schedule "C" Class EA. Photos of the creeks are shown in LGL's Appendix "A" (please refer to Appendix "C" in the Bryne Drive & Commerce Park Drive Master Plan Municipal Class Environmental Assessment Document). Recognition of environmental issues associated with each watercourse crossing have been included in the evaluation of the alternative solutions and will be further developed in consideration of the design alternatives in the next phases of the Class EA.
Evaluation of impacts on watercourses associated with each Alternative in consideration of proposed stormwater management. (3)	Mitigation of the negative environmental effects will be incorporated into the detailed design stage and subject to review and approval from the LSRCA. Water balance calculations will be undertaken at the detailed design stage to ensure that the volume of groundwater recharge, prior to road construction, is maintained. Alternative impacts were assessed in Section 4 of LGL's Report, (see Appendix "C" in the Bryne Drive & Commerce Park Drive Master Plan Municipal Class Environmental Assessment Document) and conclusions used to complete Tables 1 to 4 in the Master Plan Document. Evaluation of impacts on the watercourse associated with the preferred alternative solution, in consideration of the proposed stormwater management, will be further developed in the next phases of the Class EA.
Integration of Whiskey Creek and Highway 400 projects so that works associated with Bryne Drive, Whiskey Creek, and stormwater management are coordinated(3)	A Stormwater Management Master Plan Class EA for Whiskey Creek is currently underway, and is being used as the basis to integrate/co-ordinate stormwater management works associated with Whiskey Creek, the proposed Highway 400 Interchange, and the anticipated Bryne Drive projects.
A stormwater drainage study should be done to verify that the proposed road works will not increase downstream flooding and erosion for the 1:2 through 1:100 Year storm events. (4)	At detailed design stage, a Drainage Study will be undertaken to verify that peak flows from the Preferred Alternative Solutions will not increase downstream flooding and erosion for the 2-Year, up to the 100-Year, storm events. The report will be subject to review by the LSRCA. Where feasible, the recommended preferred design alternative solution would include directing road run-off to existing and proposed stormwater management facilities.
Enhanced water quality controls are to be provided for all stormwater run-off. (4)	Enhanced water quality controls will be incorporated at detailed design stage for all stormwater run-off originating from proposed road improvements.
Crossing of watercourses with upstream drainage areas of 125 ha or greater, need to be designed in	The upstream tributary to Lover's Creek has a drainage area that is less than 125 ha.

such a manner that there is no significant change in upstream flood levels for the 1:2 through the Regional Storm flood events. (4)	The "Draft" Recommended Preferred Alternative Solution for Whiskey Creek Class EA recommends regional conveyance improvements at Bryne Drive. There are no proposed changes associated with any of the Alternatives at Hotchkiss Creek. This creek is currently enclosed upstream of Bryne Drive.
The subject road is in a Hydrogeological ESA and, as such, an Environmental Impact Study (EIS) is required for the proposed works. (4)	A Hydrogeological EIS has been undertaken that identifies the potential impact of the proposed undertaking and mitigation measures. The EIS concludes that mitigation measures are available to prevent significant impacts to the hydrogeologic function and features within the study area. Additional sub-surface investigations and monitoring wells will be undertaken at the detailed design stage.
All wildlife features should be identified (4)	Wildlife features have been identified in LGL's Natural Heritage Report. The report concludes that no rare, threatened, endangered wildlife or significant wildlife habitat will be affected.
The Ambystomid Salamander should be assessed for the occurrence of Jefferson's Salamander. (4)	There is evidence of the Jefferson's Salamander south of the proposed road alignment. At detailed design stage, a further review of the proposed alignment will be undertaken for the occurrence of the Jefferson's Salamander.
A plant list should be provided. (4)	A plant list has been provided and mapped in LGL's Report.
The EA does not mention Hotchkiss Creek, which also crosses the subject area. (4)	Hotchkiss Creek has been added to the report. Hotchkiss Creek is enclosed upstream of Bryne Drive, and there are no proposed road geometric changes with the Alternative Solutions at Hotchkiss Creek.
All creeks in the subject area are cold water creeks requiring 30 m buffer widths and crossing design. (4)	Details of the crossing designs will be incorporated into Phases 3 and 4 of this Schedule "C" Class EA. A belt width assessment has been undertaken for Whiskey Creek and the Lover's Creek tributary to determine roadway span widths for the creek crossings.

(1) TSH letter, July 15, 2005 (2) Leon's Furniture Ltd. Comment Sheet, July 19, 2005
(3) MOE letter, July 13, 2005 (4) LSCRA letter, August 11, 2005

5.3 **Selection of the Preferred Alternative Solution**

The Bryne Drive and Commercial Park Drive Master Transportation Plan Class Environmental Assessment is a complex project that attempts to balance the current and future needs of the community with respect to the environmental, social, heritage and economic impacts on the study area. The selection of a preferred alternative for Phase 2 of this Master Plan Class EA has been based on the evaluation of the Alternatives from established criteria. The weighting used for evaluating the Alternatives was presented for input at the Open House and is shown in Table 5. Table 5 was used to assist in part to determine the overall preferred alternative solution. The proposed weighting for evaluating the alternatives indicates the relative importance of each category with respect to each other and is defined by a value from "1 to 3", with "3" being the more important. It should be noted that, criteria with a ranking of "1" does not indicate that those criteria are not important, only less important when compared to other criteria.

Rank and score for each Alternative was completed by members of the project team in consideration of input received during the public consultation process. 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 environmental effects. Score was then calculated by multiplying the weighting by the rank and the results show that *Alternative 4 – Five Lanes* is generally the overall preferred alternative solution. The major area of concern with the Five Lane Alternative is associated with the width of the right-of-way. It is therefore recommended that along portions of the opened road allowance that the road dedication be reduced from the 30 metre standard to a minimum 26 metres, as it is between Mapleview Drive and Caplan Avenue. Please refer to the Preferred Alternative Solution Drawings 1 to 4 in Appendix “D”.

From a traffic perspective, the preferred alternative solution is *Alternative 4 – Five Lanes,* for the following reasons:

- Makes good use of the existing road system;
- Provides the best level of service;
- Minimizes out-of-the-way travel;
- Has excess capacity and can provide for future development beyond the 10-year time-frame;
- Makes the best use of the existing five (5) lane sections of Bryne Drive; and
- Increases safety by reducing accidents.

Negative social and environmental effects associated with the preferred alternative solution can be mitigated.

Table 5

Evaluation Criteria and Weighting for the Alternatives

CRITERIA / SUB-FACTOR	DESCRIPTION	Weight	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Rank	Score	Rank	Score	Rank	Score	Rank	Score
Physical Environment										
Accommodation of Existing and Future Traffic Demand	The impact the planning alternatives will have accommodating the existing and future traffic demands.	3	0	0	1	3	2	6	3	9
Compatibility With Existing and Future Road Network	The improvement and compatibility of the planning alternative to/with the surrounding road network (existing and future).	3	0	0	1	3	2	6	3	9
Emergency Services	The effect the planning alternatives will have on response times of emergency vehicles.	3	1	3	2	6	2	6	3	9
Transit Service	The effect the planning alternatives will have on transit opportunities.	3	1	3	2	6	2	6	3	9
Safety	The impact the planning alternatives will have on the vehicular and pedestrian accident potential.	3	1	3	1	3	2	6	3	9
Impact on Road Capacity During Construction	The impact the planning alternatives will have on the vehicular capacity of the surrounding road network during construction.	1	2	2	2	2	2	2	1	1
Major Services / Utility Conflicts	The impact the planning alternative will have on existing utilities and services.	2	3	6	2	4	2	4	2	4
Impact on Vehicle Parking	The impact the planning alternative will have on existing and future parking opportunities	2	3	6	3	6	2	4	2	4
Fisheries and Aquatic Habitat	The impact on fisheries and aquatic habitat.	1	3	3	2	2	2	2	2	2
Wildlife Habitat	The physical impact on existing wildlife habitat areas.	1	3	3	2	2	2	2	2	2
Vegetation	The physical impact on existing vegetation resources.	1	3	3	2	2	2	2	2	2
Groundwater Resources	The impact on groundwater.	2	3	6	2	4	2	4	2	4
Water Quality / Stormwater Management	The effect on the water quality and opportunities for stormwater management.	1	3	3	2	2	2	2	2	2
Social Environment										
Existing Buildings	Existing buildings required to accommodate the planning alternatives.	3	3	9	3	9	3	9	3	9
Existing Properties	Property required to accommodate the planning alternatives.	3	3	9	3	9	2	6	1	3
Noise	The potential increase in traffic related noise	2	3	6	2	4	2	4	1	2
Pedestrian / Cyclist Facilities	The potential to maintain / improve the opportunities for pedestrian / cyclist amenities.	2	1	2	3	6	3	6	3	6
Aesthetics	The visual impact of the planning alternative	2	1	2	1	2	2	4	3	6
Access to existing properties	The effect the planning alternatives will have on supporting / improving access	3	1	3	2	6	2	6	3	9
Cultural Environment										
Archaeological / Heritage Resources	The potential impact to heritage / cultural sites.	1	3	3	2	2	2	2	2	2
Economic Environment										
Impact on Businesses	Congestion. Number of existing businesses required to accommodate planning alternatives and effect on business	3	1	3	3	9	3	9	3	9
Impact on Infrastructure Maintenance Costs	Annual infrastructure maintenance costs of the planning alternative (excluding rate of inflation and other uncontrollable factors).	1	1	1	2	2	2	2	3	3
Impact on Property Acquisition Costs	The cost associated with acquiring property to support the planning alternative.	2	3	6	3	6	2	4	1	2
Impact on Construction Costs	Road construction costs (excluding property costs and utility relocation costs).	2	3	6	2	4	2	4	1	2
Weight =	3 – Very Important, 2 – Important, 1 – Less Important			91		104		108		119
Ranking =	n/a – Not Applicable, 0 – Unacceptable, 1 – Poor, 2 – Good, 3 - Excellent									
Score =	Weight x Rank									

Alternative 1 - Do Nothing
Alternative 2 - 3 Lanes (23m Road Dedication)
Alternative 3 - 4 Lanes (26m Road Dedication)
Alternative 4 - 5 Lanes (30m Road Dedication)

5.3.1 Individual Projects

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 Document would therefore become the basis for, and be used in support of, future investigations for the specific projects identified within it. Recommended projects which may be completed independently are as follows:

a. Commerce Park Drive, from Veteran's Drive to the existing west extent of Commerce Park Drive;

b. Commerce Park Drive and Bryne Drive, from existing west extent of Commerce Park Drive to Mapleview Drive West;

c. Bryne Drive, from Caplan Avenue to the existing south terminus (north of Home Depot);

d. Bryne Drive, from existing south terminus (north of Home Depot) to Harvie Road;

e. Bryne Drive, from Harvie Road to existing north terminus (at Leon's Furniture Ltd.); and

f. Bryne Drive, from Leon's Furniture Ltd. to Essa Road.

5.3.1.1 Project Timing

The planning of projects associated with the preferred alternative solution is interrelated, but the construction of specific projects affect some projects more than others. The preferred alternative solution does not recommend any changes to Bryne Drive between Mapleview Drive West and Caplan Avenue. Therefore, construction projects south of Mapleview Drive West are logically grouped together as are the projects north of Caplan Avenue.

South of Mapleview Drive West, it is recommended that transportation improvements be included in the 10-year Capital Plan.

North of Caplan Avenue, it is recommended that no works be undertaken until:

- The alignment details and feasibility of the Highway 400 / Harvie Road interchange are known (anticipated February 2006);
- Harvie Road is upgraded between Veteran's Drive and Bryne Drive (currently in the 2007 Capital Plan); and
- The Class EA for Harvie Road / Highway 400 under/overpass is completed.

It is possible that the details of the proposed interchange will affect the proposed alignment of Bryne Drive. Once these details have been sorted out, it is recommended that the existing portions of Bryne Drive (at Home Depot and Leon's Furniture Ltd.) be widened, to take advantage of existing low traffic volumes, as soon as possible.

5.3.2 Mitigating Measures

Following is a summary of the possible negative effects on the environment, as related to the alternative solutions. The effects and their mitigating measures are preliminary, as the design process will provide further detail as to the implication of implementing the improvement and the appropriate measures to off-set the impacts. The following is not intended to be a complete list of the potential effects and the mitigating measures required, but an initial overview of the possible effects and measures. During the design stage, measures to address impacts will be identified on a site-specific basis.

TABLE 6

Mitigating Measures

Potential Negative Effect	Mitigating Measures
Safety	• Provide sidewalks and pedestrian crossings. • Follow Manual on Uniform Traffic Control Devices (MUTCD) for proper signing and pavement markings.
Impact on Road Capacity During Construction	• MUTCD Guidelines shall be followed to ensure safe lane closures / temporary conditions. • It is recommended that construction activities in the Bryne Drive / Mapleview Drive area be completed during non-peak hours.
Major Services / Utility Conflicts	• Co-ordinate with utility companies in identifying services and possible relocation opportunities.
Impact on Vehicle Parking	• Where required on opened portions of the study alignment, reduce road allowance to 26 metres, as to not affect off-street parking.
Fisheries and Aquatic Habitat	• Stage work to non-critical times • Stage work to avoid spawning periods • Restore stream substrate • If required construct temporary creek diversion • Seasonal constraints • Delineate no-touch zone using construction fencing • Minimize road dedication
Wildlife Habitat	• Maintenance of vegetated corridors • Vegetation of disturbed areas with wildlife beneficial plantings • Stage work to avoid bird breeding periods • Minimize road dedication
Vegetation	• Re-vegetation of disturbed areas with native seed mix • Delineate tree/vegetation protection areas using construction fencing • Minimize site clearing activities • Minimize road dedication

TABLE 6

Mitigating Measures

Potential Negative Effect	Mitigating Measures
Groundwater Resources	• Delineate and properly prepare refuelling areas to prevent soil contamination • Identify and protect groundwater upwelling / source areas from contamination and flow disturbance • Maintain pre-development infiltration across the study area by utilizing enhanced infiltration techniques. Infiltration across the site can be maintained by directing run-off to overland flow routes (to promote infiltration) and/or through the use of infiltration galleries. • The continuity of sand zones must be maintained to ensure baseflow to the local water features. Excavations should be backfilled with material similar to that removed from the excavation in order to minimize the disruption of groundwater flow. • All underground services should have clay cut-off plugs installed. The plugs will prevent drainage of groundwater along the granular bedding for the services. • Creek crossings must be designed to minimize disruption of the discharge features of the banks • A subsurface investigation and installation of monitoring wells to assess the groundwater elevations and shallow soil characteristics across the study site. • Installation of mini-piezometers along the banks of Whiskey and Lover's Creek. The piezometers will assess the creek function as it is related to the current groundwater regime. • Provision of a site specific water balance should be conducted as design of the development proceeds. The water balance will help to determine requirements for stormwater management and/or enhanced infiltration techniques. Ultimately, the volume of recharge prior to development should be maintained.
Water Quality / Stormwater Management	• Provision for spill control • Fast accurate reporting of spill • Pollution prevention and source control by best management land use practices and best management stormwater practices • Equipment maintenance and refuelling • Temporary stock pilling or materials away from watercourses • Implementation of erosion and sedimentation controls • Revegetation of disturbed areas • Development of a stormwater quality management plan to minimize entry of contaminants into the watercourse. This could include measures such as the use of existing quantity and quality ponds or oil-grit removal systems.
Aesthetics	• Landscape boulevards
Noise	• Reduce traffic congestion
Archaeological / Heritage Resources	• Stage 1 - Archaeological review is complete has found high potential for cultural significance • Stage 2 - Archaeological review to be undertaken in next phase of the EA

TABLE 6

Mitigating Measures

Potential Negative Effect	Mitigating Measures
Impact on Existing Businesses	• Avoid eliminating off-street parking • Notify public agencies and adjacent owners of construction scheduling • Ensure access is maintained

6.0 WORK PLAN

6.1 Where Do We Go From Here

Concerns and preferences expressed by the stakeholders at the Public Information Centre and throughout the public consultation process have been documented and addressed in this updated report, which has also made recommendation with respect to a preferred alternative solution.

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 Document would therefore become the basis for, and be used in support of, future investigations for the specific projects identified within it.

The preferred alternative solution will be presented to General Committee of Council for consideration. If endorsed by Council, specific projects identified in this report can proceed to the next phase of the Class EA process. It should be noted that, development related projects can be undertaken by the private sector because the Schedule "C" projects identified in this report are not provided for the residents of a municipality. Local residents benefit from the proposed improvements, but the improvements themselves primarily serve the adjacent existing and proposed industrial and commercial developments. Should the City elect to continue with the Class EA process, this Master Plan Class EA study will continue onto Phases 3 and 4 of the Class EA process for each individual project (see Amos letter in Appendix "I"). Phases 3 and 4 of the Class EA for each individual project will:

- Develop alternative design concepts for the preferred alternative solution;
- Evaluate the design alternatives and identify the preferred design alternative based on the analysis / evaluation criteria listed earlier in this report;
- 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 the Environmental Study Report and issue a Notice of Completion.

Another public and agency consultation is a significant component of the next phase of the Municipalities Class EA process. Interested parties will then once again have the opportunity to express their concerns and to assist in the development of alternative design

solutions. Those directly affected individuals and agencies will be notified of the future Public Information Centre.

If concerns have been raised in this phase of this Class EA which cannot be resolved in discussion with the Corporation of the City of Barrie, the Minister of the Environment may be requested, subsequent to the filing of a Notice of Completion, to make an Order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses individual Environmental Assessments.

Requests must be received by the Minister at the address below within Thirty (30) days of the publication of the Notice of Completion (a copy of the request must also be sent to the attention of the Director of Engineering, City of Barrie, Engineering Department, 6th Floor City Hall, 70 Collier Street, Barrie Ontario, L4M 4T5):

Minister of the Environment
Ministry of the Environment - Environmental Assessment & Approvals Branch
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario, M4V 1L5

APPENDIX “A”

TRAFFIC STUDY

APPENDIX “B”

ARCHAEOLOGICAL ASSESSMENT

APPENDIX “C”

NATURAL ENVIRONMENT ASSESSMENT

APPENDIX “D”

REPORT DRAWINGS

APPENDIX “E”

PHOTOS

APPENDIX “F”

HYDROGEOLOGIC INVESTIGATION

APPENDIX “G”

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APPENDIX “H”

COMMENTS AND CORRESPONDENCE

APPENDIX “I”

MASTER PLAN CLASS EA PROCESS

APPENDIX “J”

KEMPENFELT BAY WATER QUALITY DATA

APPENDIX “K”

MEANDER BELTWIDTH ASSESSMENT

APPENDIX “L”

COST ESTIMATE UNIT PRICES